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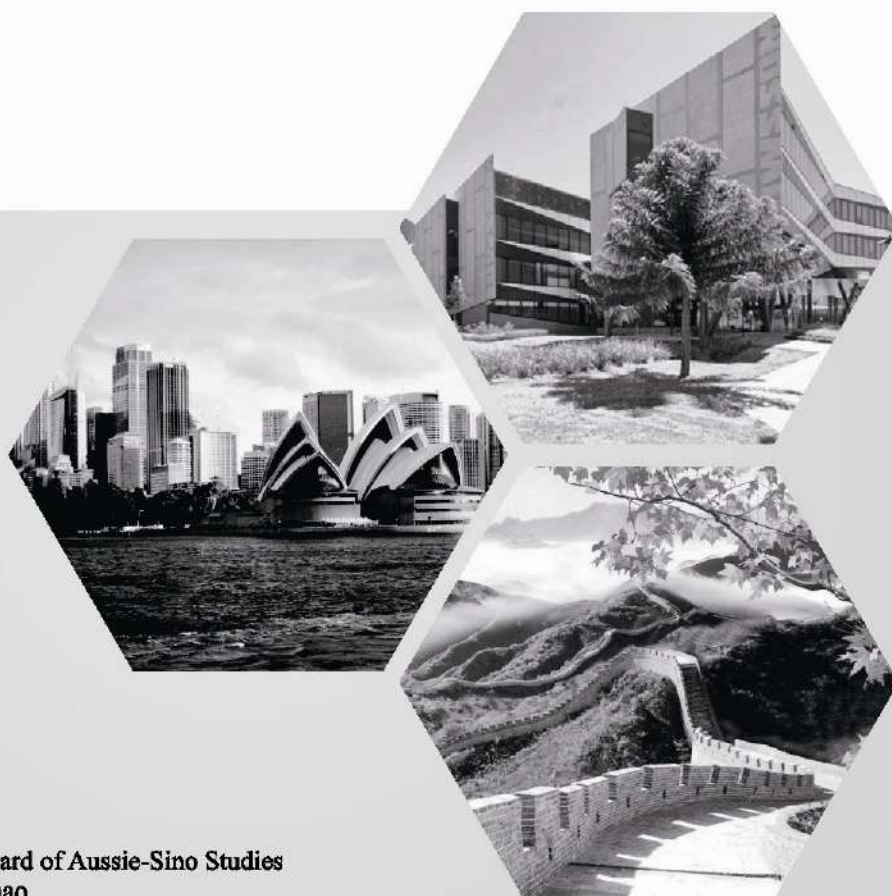
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Gender Implications of Credit Use on Urban Catfish Production in Lagos State, Nigeria

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Abstract: The study examined the gender implication of credit use on concrete catfish production in Lagos State, Nigeria. Multistage sampling procedure was employed to select seventy-eight (78) male, and forty-two (42) female respondents in the study area. The data were obtained with the aid of well - structured questionnaire and analyzed with descriptive and inferential statistical tools such as frequency count, percentages and regression model. The result of the regression analysis revealed that there is a significant relationship between total revenue and cost of feed, amount of credit used, years of farming experience, size of pond and labour. The study also showed that the sum total of elasticities of variables was less than unity (i.e. 0.801), which indicates that fish production in the study area is in stage II, which is the rational stage of production. The result of the analysis showed that the average total cost per kilogram of catfish was N460.00 and the average total revenue per kg of fish was N 760.00k. This gives a gross margin of N480.80 per kilogram of fish produced. It was recommended that policies should be put in place in other to encourage women to have access to credit so as to make catfish farming attractive to younger women in particular as a means of livelihood in the urban settings.

Key words: Urban Agriculture, Gender, Catfish, Credit Use, and Regression

Introduction

Urban agriculture have gained importance especially in developing economies since it has been discovered to be a viable intervention strategy for the urban poor to earn extra income and therefore reduces their reliance on cash income for food. It is a major component of the urban foods system by providing the diversity needed to ensure dietary quality, which is an important aspect of food security. It provides an important source of supply in urban food systems and only one of several food security options for households. The increase in human population coupled with large numbers of undernourished people, especially in developing countries, have made the need for food production a major worldwide issue of concern (Okechi, 2004).

The immense opportunities presented by increasing urbanization in Nigeria can be exploited to meet the challenges of unemployment, poverty and inadequate nutrition that pervades the cities, since they offer large markets, cosmopolitan and affluent population that demands more and better nutrition, and growing industrial and service sectors that depend on the agricultural sector for raw materials. (Nwiro, 2012). As succinctly put by Pretty et al. (2003), with dwindling food production, degrading agricultural environment, widespread poverty and insecurity in Africa, fish farming provides the poor and hungry with a low cost and readily available strategy to increase food production using less land and less water without

further damage to the environment.

Nigerian Fish farmers especially women are faced with enormous difficulties in acquiring credit facilities such as late disbursement of agricultural loans, non-fulfillment of security or collateral requirement necessitated by bad debts, diversification of funds by the banks management for non-agricultural purposes. Lack of adequate, accessible and affordable credit is among the major factors responsible for the systemic decline in the contribution of aquaculture (largely made up of catfish farming) to the Nigerian economy (Amao, 2013). This paper gives a situation analysis of the role gender plays in the urban agriculture context within the metropolitan Lagos, it looks at the implications and proffers possible solutions for policy options. In this manner, the study is designed to address the following research questions: What are the socio-economic characteristics of concrete catfish farmers in the study area? What are the roles of men and women in concrete catfish production in the study area? What are the factors affecting the output of catfish production in the study area? What are the profitability of catfish production on gender basis in the study area?

The general objective of this research is to determine gender implication of credit use on urban concrete catfish production in Lagos state by determining the factors affecting the output of gender on catfish production and analyzing the profitability of catfish production on gender basis in the study area.

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1. Literature Review

The ability to earn cash income is a significant determinant of poverty reduction and perhaps the biggest challenge urban dwellers face is that the majority of them work in sectors where wages are low, working conditions precarious and job tenure insecure. In Nigeria where most of the cities have large agricultural resources and potentials relative to the industrial and service sectors, fish farming can generate significant employment, provide income-earning potentials for the urban population, enhance the socio-economic status of the farmer as well as generate foreign exchange (Oluwasola & Ajayi, 2013; Olagunju, et al., 2007; Adekoya & Miller, 2004; Eyo, 1992). Despite the fact that spontaneous urban growth can pose a major challenge to the development and growth of large - scale farming, cat fish production is an enterprise that requires small areas of land and which can make use of the several stream channels for the sustainability of the urban environment. Fish farming also has enormous potentials of improving the nutritional standard of the masses of the people. Fish contains higher percentage of protein than meat and is important for its high nutritive value and significance in improving human health. Faced with increasing wealth, changing dietary patterns and urbanization, fish farming provides the key to meeting fish demand in the face of dwindling fish supply from captured sources. Fish farming is not just uniquely placed to reverse the declines in supplies experienced from capture fisheries but also has notable potentials for new livelihood opportunities, providing mechanism for lower priced fish, enhanced nutritional security and employment for poor communities (Jagger & Pender, 2001). Fish farming generates employment directly and indirectly in terms of people employed in the production of fishing output and other allied business, it also generates income for all categories of people involved in fish farming and thus contributes to the national income. When compared with livestock, it requires less space - time, money and has a higher feed conserving rate.

Gender norms are an important constraint to increasing agricultural productivity. Inequality in the distribution of resources between men and women is linked with production inefficiency, yet interventions targeting smallholder farmers often fail to redress women's lack of access to, and control of, important agricultural resources, complementary inputs, such as seeds and fertilizer; new varieties and technologies; agricultural extension; labor; credit; markets; and social capital (Oseni, 2003).

2. Methodology

The study was carried out in Lagos State, Nigeria. Lagos State, with an area of 3,568.6 km² and an estimated population of 17.5 million in 2006, it is the smallest (in terms of land mass)

and most densely populated state in Nigeria. With a growth rate of 3.2 percent, the State currently boasts of a population of over 21 Million people. Out of this population, Metropolitan Lagos, an area covering 37 percent of the land area of Lagos State is home to over 85 percent of the state population. Lagos state has a coastline, which stretches, up to 10 percent of its landmass. In addition, over 20 percent of its landmass comprises fresh, brackish and marine waters. The state also has a fair share of both saline and freshwater mangroves with their associated features, which sprawl about 30 percent of the entire landmass.

Sampling Technique

A multistage sampling procedure was used to select the respondents for the study. The sample frame was purposively selected with a random sample size. The concept of purposive sampling was as a result of selected farmers who specialized in concrete catfish farming in Lagos State. This was based on the peculiarity of catfish production in the study area. The first stage involved purposive selection of three ADP zones in the state (Epe, Badagry and Eti-osa). The second stage involved the random selection of three local government areas (LGAs) from the identified ADP zones. The third stage was the random selection of 14 concrete fish farmers, which comprise of both male and female farmers from each of the identified local government areas with probability proportionate to the size of LGAs. Random sampling technique was used to select 126 concrete catfish farmers out of the list of registered catfish farmers (both male and female) that was obtained from the Agriculture Department in the Area Council. The names were shuffled together and 126 catfish farmers were randomly selected through balloting. Only 120 respondents were readily available for interview.

Data were collected from primary sources through the use of structured questionnaire with the help of trained enumerators. The questionnaires were distributed to the selected catfish farmers in the study area. Data collected include socio-economic characteristics of the respondents (age, sex, family size, educational qualification, access to credit, educational attainment, marital status, experience, major occupation, access to extension agent and membership of cooperative), the inputs used (fingerlings, pond size, feed, fertilizer, labour) as well as production output (quantity of catfish in Kg) and constraints (sources of fingerlings, feed, access to credit, market,) faced by the farmers.

The three analytical techniques used to analyze the data collected for the study were descriptive statistics, net farm income, and regression model.

Descriptive statistics: The relevant instruments under this statistics include percentages and frequency distribution.

Net farm income: To determine the profitability of catfish farming in the study area, net farm income (NFI) analysis was used. The tool was used to estimate the gross revenue and total

cost in the production period. The difference between the gross revenue and the total cost of production was the profit or the net farm income. The total revenue represents the total number of fish produced multiplied by the unit price. The total cost comprises of the variable cost and the fixed cost of establishing and running the pond. The equation for net farm income is given as:

$$NFI = TR - (TVC + TFC) \dots\dots\dots(1)$$

Where: NFI = Net Farm Income (₦)

TR = Total Revenue (₦)

TVC = Total Variable Cost (₦)

TFC = Total Fixed Cost (₦)

Regression Model: The multiple regression models were also applied to determine the effect of the farmer’s socioeconomic characteristics and institutional factors on the catfish productivity. For those farmers that had access to loan, the difference in the average net income of the farmers from the catfish production before and after credit use was used as a proxy for catfish revenue:

$$Q = \pi_a - \pi_b \dots\dots\dots(2)$$

Where

a and b represent after and before respectively.

It therefore implies that, the effect of the credit - use on catfish farmers has been captured by the revenue proxy in equation (2). Four functional forms of the specified model were tried: Simple linear, semi-logarithmic, double- logarithmic, and exponential.

The production function postulated for fish farmers in the study area is implicitly presented by equation (3)

$$Q = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, \epsilon) \dots\dots\dots(3)$$

The implicit function was linearized and specified in a log-linear form (Joshi & Jha, 1992; Idumah, 2006) as:

$$\ln Q = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots\dots\dots + \beta_8 X_8 + \epsilon \dots\dots\dots (4)$$

Simple linear form:

$$Q = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \epsilon \dots\dots\dots (5)$$

Semi-logarithmic form:

$$Q = \ln \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + \beta_7 \ln X_7 + \beta_8 \ln X_8 + \epsilon \dots\dots\dots (6)$$

Double-logarithmic form:

$$\ln Q = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \epsilon \dots\dots\dots (7)$$

Exponential form:

$$\ln Q = \ln \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + \beta_7 \ln X_7 + \beta_8 \ln X_8 + \epsilon \dots\dots\dots (8)$$

The lead equation was chosen on the basis of correct signing of the explanatory variables, the significance of the regression coefficient and the value of the coefficient of multiple determinations.

Where

Q = Total Revenue (₦), X₁ = Age of farmers (years)

X₂ = Sex of the respondents/farmers. Dummy male=1, female=2

X₃ = Cost of Feed (₦), X₄ = Educational Level (years)

X₅ = Years of Experience (years), X₆ = Family size (No)

X₇ = Size of pond (square meter), X₈ = Labour (Mandays)

ε = Error term assumes to have a zero mean and constant variance.

According to Greene (2005) and Gujarati (2003), the disturbance term is expected to fulfill all the assumptions of classical regression model except that of homoscedasticity, which breaks down when, cross-sectional data are used (Ayanwale and Osotimehin, 2001). The technique of the ordinary least square (OLS) was then used to estimate the multiple regression equation. Rather than a straight line, geometric interpretation of the model involved a plane. The R therefore measured the strength of the relationship between net income from catfish production and the specified explanatory variables.

A priori expectations for the variables X₁, X₄, X₅, X₇ and X₈ were expected to be positively associated with total revenue while X₃ is negatively associated with total revenue and X₆ could be positively or negatively associated with revenue depending on whether the family is a production or consumption unit. The selection of the variables used in the regression model as well as the a priori expectations were based on the assumption that in traditional and near subsistent farming enterprises characterized by low resource inputs, age of the farmers (X₁), family size (X₆), farming experience (X₅), labour (hired and family labour) (X₈) and educational level of respondents (X₄) are critical to output (Akinola & Adeyemo, 2008) and the ability of farmers to take risks in adopting new innovations or technologies (Adesina & Zinnah, 1992;). Other studies on fish farming like (Olaoye et al., 2013; Olagunju et al., 2007) added other inputs such as cost of feed (X₃) and pond size (X₇). This present study therefore added the variable X₂ (sex=dummy). The four functional forms of the regression model - linear, semi-log, exponential and the double logarithm were fitted to the model but only the double logarithm model which provided the best fit and was in line with a priori expectation was selected and discussed.

3. Results and Discussion

Socio-economic Characteristics of the Concrete Catfish Farmers

The distribution of the socioeconomic characteristics of male and female Catfish farmers is presented in Table 1. The fish farmers as indicated were in their prime age and hence, economically active (Aihonsu & Olatingiri, 2012). Given

necessary resources, these sets of farmers could increase their productivity. They are also in the age where they could take risks that could increase output as well as income (Akinola & Adeyemo, 2008). The result shows that majority of the male (59.0%) and the female (66.7%) Catfish farmers had tertiary and secondary educational qualification respectively. The high level of education might be due to the urban nature of the study area and its implication is that the respondents will be very receptive to new innovations in their methods of production.

Fifty seven (57) percent of the urban catfish farmers had up to 5 household members. The average household member was however 4. This is contrary to the general believe that catfish farm operators in South Western Nigeria generally had a large family size. Large family might be exploited as cheap sources of labour for the poultry farms. However, large family sizes might be a drain for business profit, as household expenditure, particularly on consumption, is high. This basically explains why most small - scale farms close down when they could no longer provide the required funds for their smooth operation.

A larger proportion (51.3%) of the male Catfish farmers and 42.9% of the female Catfish farmers had 1 – 5 ponds. This implies that both the male and female Catfish farmers had access to the same number of ponds. These enhance their production and livelihood. Most (67.9%) of the male Catfish farmers had no access to training on Catfish production. However, the female

Catfish farmers had more access to training than the male catfish farmers. This implies that there is a greater awareness and the institutional support in training the Catfish farmers especially the women, which invariably enhances their productivity in Catfish production. This is an indication that urban female catfish farmers utilize their full potentials in profitable activities, like aquaculture. This is also reflected in the number of hours they spend on the farm. The women spent an average of 2.7 hours while men spent an average of 2.2 hours on farm. It implies that women spent more time on farm than men due to the fact that most women involved in sorting and processing which could take much of their time before finishing the work. Credit availability is very significant in catfish production. The farmers need credit to buy feeds, pay for drugs, buy fingerlings, pay for quality water and pay for high cost of pond maintenance. Table 2 shows the distribution of the respondents' pond acquisition based on their initial capital as well as the ability to seek more fund to support the catfish production. Catfish famers that had access to additional fund, were able to acquire more number of ponds. Highest percentage (66.7%) of female catfish farmers and 62.5% of male catfish farmers were able to acquire more than 4 ponds for their business. This implies an increase in the number of catfish produced at any point in time. They will also enjoy economies of scale. The same thing happens to the size of pond the catfish farmers could afford.

Table 1. Frequency and Percentage Distribution of Concrete Catfish Farmers

| ITEMS | MALE | | FEMALE | | |
|---------------------|-------------|----|--------|----|------|
| | Freq | % | Freq | % | |
| SEX | 78 | 65 | 42 | 35 | |
| AGE | 20-30 | 8 | 10.3 | 5 | 11.9 |
| | 31-40 | 13 | 16.7 | 18 | 19.1 |
| | 41-50 | 20 | 25.6 | 19 | 45.2 |
| | 51-60 | 28 | 35.9 | 6 | 14.3 |
| | >60 | 9 | 11.5 | 4 | 9.5 |
| EDUCATION | Primary | 7 | 8.9 | 6 | 14.3 |
| | Secondary | 25 | 32.1 | 28 | 66.7 |
| | Tertiary | 46 | 59.0 | 8 | 19.0 |
| HOUSEHOLD SIZE | 0-5 | 45 | 57.7 | 24 | 57.1 |
| | 6-10 | 23 | 29.5 | 12 | 28.6 |
| | >10 | 10 | 12.8 | 6 | 14.3 |
| YEARS OF EXPERIENCE | 1-5 | 40 | 51.3 | 18 | 42.9 |
| | 6-10 | 23 | 29.5 | 14 | 33.3 |
| POND SIZE | >10 | 15 | 19.2 | 10 | 23.8 |
| | 1-400SQM | 43 | 11.5 | 28 | 66.6 |
| | 401-800SQM | 26 | 33.3 | 11 | 26.2 |
| ACCESS TO CREDIT | 801-1200SQM | 9 | 11.5 | 3 | 7.1 |
| | YES | 40 | 51.3 | 18 | 42.9 |
| | NO | 38 | 48.7 | 24 | 57.1 |

| | | | | | |
|--------------------------------|-----|-----|------|-----|------|
| | NO | 53 | 67.9 | 12 | 28.6 |
| | YES | 25 | 32.1 | 30 | 71.4 |
| ACCESS TO TRAINNING | | | | | |
| | | 2.2 | | 2.7 | |
| AV. OF HOURS SPENT ON THE FARM | | | | | |
| OTHER SOURCES OF OCCUPATION | | | | | |
| | YES | 74 | 94.9 | 40 | 95.2 |
| | NO | 4 | 5.1 | 2 | 4.8 |

Source: Data Analysis, 2016

Table 2. Distribution of Respondents' Pond Acquisition Based on Credit Access

| | ACCESS TO CREDIT | | | | NO ACCESS TO CREDIT | | | | |
|-------------|------------------|------|--------|------|---------------------|------|--------|-----|--|
| | MALE | | FEMALE | | MALE | | FEMALE | | |
| | (40) | (%) | (18) | (%) | (38) | (%) | (24) | (%) | |
| NO OF POND | | | | | | | | | |
| 1-2 | 4 | 10.0 | 2 | 11.1 | 35 | 92.1 | 24 | 100 | |
| 3-4 | 11 | 27.5 | 4 | 22.2 | 2 | 5.3 | - | - | |
| >4 | 25 | 62.5 | 12 | 66.7 | 1 | 2.6 | - | - | |
| POND SIZE | | | | | | | | | |
| 0-400SQM | 3 | 7.5 | 2 | 11.1 | 32 | 84.2 | 24 | 100 | |
| 401-800SQM | 09 | 22.5 | 2 | 11.1 | 5 | 13.2 | - | - | |
| 801-1200SQM | 28 | 70.0 | 14 | 77.8 | 1 | 2.6 | - | - | |

Source: Data Analysis, 2016

Gender Based Gross Margin and Net Returns Analysis

The result of the profitability of Catfish production from a gender perspective is reported in Table 3. The gross margin analysis for the calculation of the profitability was carried out on kg of catfish raised per production cycle. According to Adeyeye and Dittoh (1982) Gross margin is a good measure of profitability. The result shows that the total variable cost incurred by male and female farmers were ₦460 and ₦510 respectively while the total revenue accrued to the male and female farmers were ₦300 and ₦250 naira respectively.

The gross margin of the male Catfish farmers was higher than that of the female Catfish farmers, which indicates that the profitability of the male Catfish farmers was higher than that of the female Catfish farmers. The returns per naira of 1.65 for the male Catfish farmers implies that for every 1 naira invested in kg of Catfish production, the farmers make a return to investment of ₦1.65k naira. In the case of the female Catfish farmers, a return per naira invested was estimated to be ₦1.49 that indicates that for every 1 naira invested in kg of Catfish production, the farmers make a return to investment of ₦1.49k naira. Although, the male and female Catfish farmers make profit from investment in Catfish farming, the profit margin of the male

Catfish farmers was higher than that of the female Catfish farmers. A plausible explanation for the observed difference in the profit margin of the male and female Catfish farmers is that access to resources especially quality water for fish production, control of assets, decision-making powers between women and men tend to favour the male Catfish farmers than the female cat fish farmers.

This is in line with Anosike and Fasona (2004), who noted that women have more difficult access to water in Lagos state. Doss (2001), opined that gender affects access to labor, land and other important inputs for production and may also affect preferences around production processes and outputs. In addition, women within the household may have less tenure security than men, which makes them less likely to invest in certain types of agricultural technologies that can enhance their productivity. Drechsel, Hope, and Coe (2013), also noted that women have limited access to land and starting capital for agriculture. The implication of the result of the gender based profitability analysis is that women with a lower profitability compared to men will tend to have a lower livelihood support from Catfish production in contrast to men who will tend to have a higher livelihood support from Catfish farming as a result of their higher profit margin.

Table 3. Average Cost and Returns of Farmers Per Kilogram of Fish Raised

| MALE CATFISH FARMERS | | FEMALE CATFISH FARMERS | |
|----------------------|-----------|------------------------|-----------|
| AMOUNT (₦) | % OF COST | AMOUNT (₦) | % OF COST |

| VARIABLE COST | ITEMS | | | | |
|----------------------------|---------------------|------|------|------|------|
| | Cost of fingerlings | 110 | 23.9 | 130 | 25.5 |
| | Cost of labour | 70 | 15.2 | 90 | 17.6 |
| | Cost of feeds | 280 | 60.9 | 290 | 56.9 |
| | Total variable cost | 460 | | 510 | |
| REVENUE | Catfish sold Per Kg | 760 | | 760 | |
| GROSS MARGIN | (TR-TVC) | 300 | | 250 | |
| RETURNS PER NAIRA INVESTED | | 1.65 | | 1.49 | |

Source: Data Analysis, 2016

Test of Hypothesis

The null hypothesis, which states that there is no significant difference in profitability between male and female Catfish farmers in the study area, was rejected because the calculated z value (78.4) is greater than the z critical one tail (1.55) and two

tail (1.86) at 1% level of profitability as shown in Table 4. The study then concludes that there is a significant difference in the profitability between male and female Catfish farmers in the study area.

Table 4. z-Test: Two Sample for Means

| | Male cat fish farmers | Female cat fish farmers |
|------------------------------|-----------------------|-------------------------|
| Mean | 12199.920344 | 10441.9234 |
| Known Variance | 13070.973 | 11187.47 |
| Observations | 78 | 42 |
| Hypothesized Mean Difference | 0 | |
| Z | 78.43160654 | |
| P(Z<=z) one-tail | 0 | |
| z Critical one-tail | 1.546883218 | |
| P(Z<=z) two-tail | 0 | |
| z Critical two-tail | 1.861993576 | |

Source: Data Analysis, 2016

Estimated Production Function

In determining the factors affecting catfish production, a structural relationship was specified. Total revenue was regressed on the demographic characteristics of the farmers, socio-economic characteristics and other independent variables as cost of feeds, type of ponds. Though four functional models (linear, semi-log, exponential and double log) were used, the double log was chosen. The choice of the production function is predicated on its conformation to a priori expectation in terms of signs and magnitude of the coefficient, the number of significant variables and the coefficient of multiple determinations (Olayemi and Olayide, 1981). The regression result is presented on Table 5, showing the coefficients and the t-tests. The adjusted R^2 for the estimated regression showed that about 74% of variation in total revenue of fish's farmers in the study area was explained by the explanatory variables with the remaining 26% unexplained; this is due to random variable (ϵ).

Five of the estimated coefficients sex (X_2), educational level (X_4), farming experience (X_5), size of pond (X_7) and labour (X_8) have positive signs which indicated that an increase in any of the five variables would increase the level of total revenue of the respondents Ceteris Paribus. The coefficients of age (X_1); cost of feed (X_3); family size (X_6) had negative signs, which indicated that an increase in any of these variables would decrease the total revenue of the respondents Ceteris Paribus. Labour, size of pond, Farming Experience, Cost of feed and Education were significant at 10%, 5% and 1% level respectively. The number of labour used (X_8) was statistically significant with its coefficient indicating that an increase in labour used by a man-day will increase net income by 80%. This is very important, as labour is the most important input in smallholder farm business enterprises. The size of pond (X_7) was also statistically significant with increase in net income by 33.5%.

Table 5. Multiple Regressions Estimates of Factors Affecting Catfish Production

| Variables | Factors | b-values | t-values |
|-----------|----------|----------|----------|
| | Constant | 2.247 | 2.143** |
| X_1 | Age | -0.526 | -0.043 |
| X_2 | Sex | 0.369 | -0.739 |

| | | | |
|----------------|---------------------------------|--------|----------|
| X ₃ | Cost of feed | -0.457 | 2.428** |
| X ₄ | Number of years spent in school | 0.291 | 3.323*** |
| X ₅ | Years of Experience | 0.006 | 2.096** |
| X ₆ | Family size | -0.024 | -0.094 |
| X ₇ | Size of the pond | 0.335 | 2.730** |
| X ₈ | Labour | 0.807 | 1.915* |
| R ² | | 87.68 | |
| R ² | | 74.15 | |
| F | | 53.243 | |

Source: Field Survey, 2016

***sig. at 1% ; **sig. at 5% ; *sig. at 10%.

Elasticity of Production and Return to Scale

The total sum of elasticities of production of the variables as shown in Table 6 was less than unity that is 0.807 indicating decreasing returns to scale. This suggests that catfish production in the study area had a decreasing positive return to scale. Each

additional unit results in a smaller increase in product than the preceding unit. The catfish production in the study area fall within the rational stage (Stage II) of the production function. The implication of this is that the more input one puts in, the higher the profit even through at a declining rate.

Table 6. Elasticity of production and return to scale of urban catfish farmers in Lagos State

| Independent Variables | Elasticity of Production |
|-----------------------|--------------------------|
| X ₁ | -0.526 |
| X ₂ | 0.369 |
| X ₃ | -0.457 |
| X ₄ | 0.291 |
| X ₅ | 0.006 |
| X ₆ | -0.024 |
| X ₇ | 0.335 |
| X ₈ | 0.807 |
| Return to scale | |

Source: Data Analysis, 2016

Constraints Associated with Concrete Catfish Production

The results in Table 7 show that all the women Catfish farmers attributed poor water quality to be the major constraints militating against their profitability in Catfish farming and invariably their source of livelihood. Also, the issue of proper disposal of water from ponds as indicated by 39 out of the 42

women Catfish farmers is a high-ranking constraint affecting the income generation from Catfish farming. The major issue that is militating against the profitability of men Catfish farmers is high cost of feeds as indicated by 71 out of the 78 men Catfish farmers. Among other constraints facing the female catfish farmers are the issues of cannibalism and poor management.

Table 7. Distribution of Respondents Based on Constraints Associated with Concrete catfish Production

| | Male | | Female | |
|----------------------------------|-----------|------|-----------|------|
| | Frequency | % | Frequency | % |
| 1. High cost of feeds | 71 | 91.0 | 38 | 90.5 |
| 2. Availability of quality water | 36 | 46.2 | 40 | 95.2 |
| 3. Water disposal | 28 | 37.8 | 39 | 92.9 |
| 4. High cost of labor | 42 | 37.8 | 41 | 97.6 |
| 5. Lack of extension services | 68 | 87.2 | 15 | 35.7 |
| 6. Shortage of fingerlings | 28 | 35.9 | 22 | 52.4 |
| 7. Inadequate funds | 38 | 48.7 | 37 | 88.1 |
| 8. High cost of pond maintenance | 16 | 20.5 | 29 | 92.9 |
| 9. High mortality of fish | 26 | 33.3 | 37 | 88.1 |
| 10. Pest and diseases | 41 | 52.6 | 29 | 69.0 |
| 11. Cannibalism | 36 | 46.2 | 41 | 97.6 |
| 12. Poor management | 28 | 35.9 | 37 | 88.1 |

Source: Data Analysis, 2016

Multiple Responses

Roles Played By Men and Women in Concrete Catfish Production

Table 8 showed the distribution of respondents by roles played in concrete catfish production. Based on the result of finding, men were more involved in feeding (100.0%), stocking (96.2%), cropping (93.6%), sorting (61.5%) and processing (26.9%) in the rank order. Moreover, women were more involved in feeding (100.0%), buying/selling (100.0%), stocking

(52.4), cropping (52.4%), sorting (76.2%) and processing (90.5%) in the rank order. However, more of women than men were involved in buying/selling, sorting and processing, while more of men than women were involved in stocking and cropping activities due to the fact that men have more strength and rugged than women and catfish farming requires much energy which female may not be able to cope with.

Table 8. Distribution of Respondents Based on Roles Played by Men and Women

| Roles | Male | | Female | |
|---------------------|-----------|-------|-----------|-------|
| | Frequency | % | Frequency | % |
| Feeding | 78 | 100.0 | 42 | 100.0 |
| Stocking | 75 | 96.2 | 22 | 52.4 |
| Cropping/harvesting | 73 | 93.6 | 22 | 52.4 |
| Sorting | 48 | 61.5 | 32 | 76.2 |
| Buying/selling | 23 | 29.5 | 42 | 100.0 |
| Transportation | 20 | 25.6 | 15 | 31.3 |
| Processing | 21 | 26.9 | 38 | 90.5 |

Source: Data Analysis, 2016

Multiple Responses

Conclusion and Recommendation

Insufficient funding of urban catfish farmers (especially for women) has limited the spate of development of the industry in Lagos State Nigeria. This has often caused low level of production output in the industry. In this study therefore, the impact of credit on urban male and female catfish farmers was investigated. This study shows that credit is very important in catfish production. This is a major challenge to policymakers and operators of credit institutions such as banks and cooperative societies. The role of labour as captured by the household size is equally found to be critical. This implies that improvement in the catfish production sector could help to absorb the unemployed. Production of catfish is highly profitable and it is related to size of the enterprise. Other variables that contributed to the profitability included age, educational status and the number of labour used. It is therefore recommended that more people should be encouraged to participate in the business so as to increase their income. The Association of Cat fish Farmers should organize training, workshops and seminars for their members so that they could have access to improved methods and technologies of catfish production. Finally, as more funds were made available to the catfish farmers at minimal costs, the level of output in industry will improve.

This study has also established that gross margin of the male Catfish farmers (₦300/kg) was higher than that of the female Catfish farmers (₦250/kg) which indicates that the profitability of the male Catfish farmers was higher than that of the female Catfish famers. Hence, women with a lower profitability

compared to men will tend to have a lower livelihood support from Catfish production in contrast to men who will tend to have a higher livelihood support from Catfish farming as a result of their higher profit margin. All the women Catfish farmers attributed poor water quality to be the major constraints militating against their profitability in Catfish farming and invariably their source of livelihood. It is recommended that differences in conditions, needs, access to resources, control of assets, decision-making powers between women and men based on their assigned gender roles are taken into consideration in manpower training, equitable distribution of resources and access to supportive services by both genders towards enhancing their Catfish productivity and increasing their livelihood support. Urban agriculture should also be established as a legitimate and viable urban economic activity. Furthermore, since it has been identified that women participate in urban agriculture, they should be provided with production resources especially credit. This is because if women have greater control over fund, the incentive for them to increase production may be greater. This would therefore lead to increased production, better income and improved standard of living for urban dwellers. The practice of urban agriculture thus serves as a coping mechanism in dealing with poverty and economic hardship, which are prevalent in urban areas.

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Quantification of Urban Leisure-Time Physical Activity (LTPA) Among University Students in South-West, Nigeria

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Abstract: Background: Regular participation in urban leisure-time physical activity is beneficial to human health. Despite its importance, it has continued to decline among Nigerians students, consequently leading to rising prevalence of chronic diseases and conditions. There is the need to understudy the various strata of the Nigerian population. **Purpose:** This study focused on the quantity of urban LTPA among university students with a view to facilitate intervention programmes. **Methods:** The study adopted descriptive survey design. All the students in public-owned universities in Southwestern Nigeria were used for the study. The sample for the study was 2,730 which was 10% of male and female students in penultimate and final classes in the selected universities using multi-stage sampling technique. The researchers' constructed instrument was used to collect data. The data collected were analyzed using descriptive statistics of frequency, percentage, mean, standard deviation and inferential statistics of t-test with 0.05 for statistical significance. **Results:** The study revealed that more than half of urban university students in Southwestern Nigeria were not meeting the international physical activity guidelines during leisure-time, sedentary, n = 1473 (52.6%); low intensity LTPA, n = 1796 (64.8%). Quality Physical Education in tertiary institutions geared towards skill development for students' involvement in regular urban LTPA is recommended.

Key words: active activity, leisure-time, passive activity, physical activity, sedentary lifestyle

Introduction

Most human activities, LTPA inclusive are related to the environment. The term environment is derived from the France verb 'environner' meaning 'to surround'; therefore, environment literarily means our surrounding which is synonymous to urban settlement in the context of this study. Environmental variables may serve as facilitator or inhibitor of LTPA. For instance, extreme changes in the physical environment can promote extreme impact on human body, indicating that the status of human health, energy and comfort can be altered by the physical environment to dissuade a person from engaging in LTPA. Leisure programmes are dependent on environmental quality. Citing Darwin's theory, Jarvie (2006) accentuated that the survival of species would at least partly depend on their adaptation and sustainability to their surroundings. Likewise, Morgan (2001) posited that when there is congruence between an individual and his environment, they would be happier, better adjusted and more likely to achieve personal goals. The environmentalists believed in the importance of the environment as a determinant of human life (Jarvie, 2006). Thus, leisure is an important basis for the protection of natural, historical, cultural

resources and landscape (Williams, 2006).

Since the old days, people have believed in the internal and external powers and forces which drive and direct man. Brymer & Cuddily (2009) have the conviction that human activities benefit from environment. Physical environment provides cues and opportunities for LTPA (Giles-Corti & Donovan, 2002). This may explain why the attention of researchers is no longer focused on individual-level determinants of LTPA alone, but also on the environment in which people perform activities because it influences the frequency, duration, intensity and type of activity (Lee & Garraway, 2010). Physical environment includes the "built environment" and the "natural environment".

The term 'built environment' refers to man-made surroundings that provide the setting for human activity, ranging from personal shelter and building to neighbourhood and city with other supporting infrastructure (Tomori, 2012). Smith, Troped, McDonough and Defreeze (2015) put it succinctly by defining built environment as the structure of the physical environment that is deliberately constructed or modified by human activity, such as buildings, streets, and parks or play spaces. The natural environment includes forest, landscapes, coastal region, weather conditions and seasonal variations. As

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leisure professionals, if we want to provide choice of activities and opportunities for people to experience and develop leisure potentials, then we must provide a favourable physical environment, the right conditions, satisfactions and positive outcomes (Torkildsen, 2005). The physical environmental factors determining leisure-time physical activity are community designs, access to facilities, safety, public transportation and weather conditions and seasonal variations.

Urban leisure-time activity provides opportunity for people living in the town to interact and benefit from their environment-intrapersonal, social and physical environment. The knowledge of its usefulness to humanity prompted various national governments, international organizations and advisory groups to continue to advocate for the positive use of leisure-time. Pieper in Hardman (2001) described leisure as the “basis of culture”, the psychological and spiritual disposition that is the fundamental prerequisite for the great works of art, music, theater and philosophy. It provides opportunities for individuals to seeking new experiences, gain knowledge, skills, attitudes and values. According to Edginton, Jordan, Degraaf and Edginton (2012) it gives room for self-exploration to re-event, refocus, renew, refresh, replenish and transform. Archibald (2005) in his research reported that people fail or succeed in life because of their leisure choices. Leisure has the capacity to clarify our intrapersonal and interpersonal characteristics to others and therefore helping us to reveal our identity to others (Hardman, 2001). Leisure is like a two-edged sword; one edge can provide the background for creativity and development and the other can direct people to moral decadence and social problems. It must be noted, therefore, that leisure can be a curse or blessing; an asset or a liability depending on its content (Torkildsen, 2005).

Leisure-time activities related to town dwellers can be divided into two major parts: Active/leisure-time physical activities and passive/sedentary leisure-time activities. These activities may be carried out in the neighborhood (recreation) or in the course of travelling (tourism). Casperson in Cushman and Ladlier (1990) defined Leisure-Time Physical Activity (LTPA) as the bodily movements during leisure-time produced by skeletal muscles that lead to increase in energy expenditure. The energy to be expended on these activities depends on the quantity/volume (type, intensity, duration and frequency) of activity. They may be in form of sporting activities, exercise, chores in and out of the house or any other recreational activities that can help improve quality of life (Newton, Guo, Yang & Malkin, 2012). Whereas, passive leisure-time activity is a sedentary lifestyle, which according to Owen, Leslie, Salmon and Fotheringham (2000) involves less or no physical activity. In addition, they submitted that physical activeness and sedentariness can coexist, emphasizing the clarity in the relationship between physical activity and sedentariness. This may include watching live and televised programmes, reading

novel and engaging in internet-based activities. According to Thayse, Donald, Fernanda, Michele, Daniel, Sara, Peter and José (2017) both sedentariness and physical activity are linked with a wide array of biological, social, behavioural, and environmental correlates. Thus, sedentariness among other factors is considered a potential risk in youth, due to its link to the increase in the prevalence of overweight/obesity and metabolic risk factors. In most cases, sedentariness is viewed as the opposite of physical activity, which supports the “displacement hypothesis” assuming that inactive behaviours may replace ones that are more active.

LTPA is in various forms, this activity includes walking, playing tennis, playing soccer, fishing, swimming etc. Sharp, Turker, Baril, VanGundy, and Rebellion (2015) perceived type of activities as the number of different activity contexts to which an individual is exposed. It does not mean the total number of activities, but rather the variety of activities engaged in by participants. For students, most physical activities occur at home, school and neighborhood. Therefore, it is likely that factors of these levels may interact with individual characteristics to influence their LTPA patterns (Correa, Cordiera, Marques, Dominiquez, Demarco & Hallal, 2013). Ensuring variety in LTPA has long been espoused for participants’ enjoyment. Incorporating variety of LTPA in terms of type, intensity, duration and frequency, in a workout is important for maximum benefits.

According to Corbin, Welk, Corbin & Welk (2004) and Health Promotion Board (2011), there are basically three types of LTPA. They are lifestyle activity, exercise activity, sports activity. Lifestyle is described as a way of living based on identifiable patterns of behaviour, which are determined by interplay between an individual’s personal characteristics, social interactions, socioeconomic and physical environment conditions (World Health Organisation, 2012). Therefore, lifestyle physical activities are physical activities performed by an individual on a routine basis (for example, walking, climbing stairs, mowing or raking the yard) which is usually light to moderate intensity and help to burn calories also caused a minimal increase in breathing and heart rate. These activities can easily be built into daily life activity (Hardman & Stensel, 2003). Lifestyle activities allow a person to choose from a large variety of leisure and household activities to accumulate the recommended 30 minutes of MVPA each day of the week (Opdenacker, Boen, Auweele & Bourdeaudhuij, 2008).

Variation in personal goals may lead to difference in the quality of LTPA among town dwellers. Exercise and sport are subsets of physical activity that enhances health (Corbin, Welk, Corbin & Welk, 2004). Haapanen-Neiremi (2000) defined exercise as a principal form of physical activity that is planned, structured, repetitive and purposive bodily movements engaged in, in order to improve or maintain one or more components of physical fitness (Haapanen-Nreimi, 2000). It is often associated

with fitness maintenance and improvement only (Beutel, 2013). Whereas sport is seen as an organised competitive activity that require adherence to rules and/or customs and specific skill to play, the objective is often associated with winning or losing (Corbin et al, 2004).

From the ancient time, it has been proven that engaging in physical activity is beneficial to men and women. Hippocrates (5th century BC), the father of preventive medicine wrote extensively on the curative and preventive powers of physical exercise for a variety of ailment, including mental illnesses (Biddle, Fox & Boutcher, 2004). Recent research evidence further corroborated this age-long belief that habitual engagement in leisure-time physical activity has protective effect against the on-set of over 25 chronic diseases including cardio-vascular diseases, type II diabetes mellitus, colon and breast cancers, stroke, osteoporosis (Kirk & Rhodes, 2010). Nabofa (2010) in his literature submitted that reducing inactivity among the people by 10% could eliminate more than half a million deaths every year. Furthermore, researches have demonstrated that inactivity (sedentary life style) is detrimental to human health. The World Health Organization in Mandigo (2010) reported that in 2001, 1.9 million global deaths were attributed directly to inactivity. The WHO (2005) remarked that inactivity caused 15% of cancers, diabetes and heart diseases in Nigeria. In economic terms, the WHO has projected that Nigeria will lose 10 billion dollars in 2017 to chronic diseases and conditions caused by inactivity. Hardman (2001) remarked that sick population not only incurs medical expenses, but it also drains the economy through low productivity.

Despite these research evidences, LTPA has continued to diminish among different segments of Nigerian population. Talabi, Ajayi-Vincent and Aribamikan (2010) opined that this may be due to advance technological development which has increase conform and convenience of Nigerians, thereby making them physically inactive. About 8 million Nigerians suffer from hypertension; 4 million has diabetes, 100, 000 new cases of cancers are diagnosed each year in Nigerians (Ekpeyong, Udokang, Akpan & Samson, 2013).

From the foregone analyses, there is the urgent need to understudy the LTPA of Nigerians. Various authors recommended periodic in-depth examination of different strata of Nigerian society to ascertain the status of LTPA among them. (Alla, 1997, Awotidebe, Adedoyin, Adegbesan, Babalola, Olukoju, Mbada, Chirwa & Bisiriyu, 2014). In consonant with this position, Hansen, Vistisen, Cartensen, Helge, Linneberg, Witte, and Aadahl (2012) noted that there is need to consider LTPA by domains and not overall LTPA of the general population. In fact, this is essential because various social groups and domains experience a diverse quality of LTPA.

The World Leisure Board of Director (2000) postulated that to develop a high quality and sustainable LTPA culture in any

society, it must commence from educational institutions, particularly colleges and universities. These institutions constitute powerful vehicle through which the basic skills and values needed to function effectively in society are transmitted to the people. Furthermore, it provides an avenue to teach the nature and importance of LTPA and how to integrate the knowledge acquired into personal lifestyles. Biddle and Mutrie (2008) observed that colleges and universities have benefits for the target of LTPA because, first, it captured a critical age range at which change in behaviour appears most likely to be formed and retained. Secondly, students spend most of their time in the school; therefore, school-wide strategies will enable virtually all members of an age range to be targeted. Thirdly, LTPA delivery structures through Sports Centres/Units are already in place in the universities to facilitate skill development. Lastly, a positive behaviour change achieved at this level can track physical fitness to adulthood.

Three facts seem to emerge from this discussion. Firstly, habitual LTPA appears very useful in building and maintaining a healthy lifestyle. Secondly, there is decline in LTPA among Nigerians. Thirdly, there is limited knowledge of the quantity (volume) of LTPA among various domains of Nigerian society to accentuate programme planning and delivery. Thus, this study intends to study the quantity of LTPA among university students in South-west Nigeria with a view to quantifying the type, duration, intensity and frequency of their participation. Understanding the quantity/volume (type, duration, intensity and frequency) of physical activity will help the students to achieve the right volume of activity to effect physical, physiological, psychological, social and mental change (Erickson, 2013).

The physical activity guidelines of at least 60 minutes of Moderate to Vigorous Intensity Physical Activity (MVPA) per day for at least 5 times a weekly on regular basis has been recommended for people globally (Centre for Diseases Control and Prevention, 2014). Ahrabi-Fard, McCumber and Dolgerier (2013) argued that to design the right type of activity with correct type, duration, intensity and frequency for an expected outcome, professionals need a detailed awareness of individual abilities and condition to help his/her life specific situation with positive results. According to Dobbins, Husson, Decorby and LaRocca (2013), the type, intensity, frequency and duration of LTPA contribute to overall physical health status and suggested that a threshold must be maintained in order to produce health effects. The result of this study will assist policy makers, sports administrators, coaches, parents and other stakeholders to give the necessary supports that will help improve LTPA among the students and consequently enable them to enjoy the benefits of regular participation in LTPA.

Evidence available showed that LTPA has continued to be on the decline among university students in Nigeria (Awotidebe et. al. 2014). The advents of attractive sedentary leisure activities

seem to have turned the hearts of our hitherto active university students away from physical activities. It appears they are more involved in inactive activities such as motorised activities, video games, internet surfing activities, at the expense of physical activities that are more beneficial to healthful living.

Scary figures on health indicators for Nigeria especially as it relates to Non-Communicable Diseases (NCDs) at every stratum of the population particularly the adolescent, the age group most university students belong abound in literature (Adegoke 2013; Awotidebe, et. al., 2014; Adegboyega, 2015). This study focused on university students because prevalence of overweight (13.8%) and obesity (9.4%) amongst them was attributed to insufficient LTPA (Oyeyemi, Ishaku, Deforche, Oyeyemi, Bourdeaudhuiji & Van Dyck, 2014). According to Mogre, Nyaba, Aleyira and Sam (2015), overweight and obesity are the leading causes of non-communicable diseases such as cardiovascular disease, type 2 diabetes mellitus, some types of cancers and metabolic syndrome.

The health status of university students should be of great concern to the government at various administrative levels in Nigeria because physical fitness at this period tends to track health fitness to adulthood (Chen, Mason, Zalmont & Hammond-Bennett, 2013). As reflected in the 2011 United Nations (UN) Declaration on NCDs, national leaders worldwide recognised if that left unchecked, NCDs would place enormous strain on the health systems and economies of many nations. It is apparent today that State Governments in South-west, Nigeria have relatively limited resources to devote to healthcare of people with NCDs, now that the national economy is sliding due to drop in the international price of crude oil (Ajani, 2011). Therefore, it is important, that universally accepted health behaviour such as LTPA is encouraged among university students because of its cost-effectiveness in prevention and cure of chronic diseases and conditions.

It is now widely accepted that health and wealth are connected and that favourable population health status will boost economic and social development (Report of the Obesity Working Group, 2013). Unfortunately, it is not certain if the university students who constitute significant portion of Nigerian population participate in LTPA and if they do, the pattern of engagement and the determinants of their participation are yet to be ascertained for effective programme planning and implementation. Previous related studies were focused on participation of university students in organized sports as a way of expending energy for gaining favourable health outcomes (Akindutire & Oyeniyi, 2012; Awosika & Olusola, 2014). However, there are varieties of ways university students can achieve this outside participation in organised sports. The activities that have been largely neglected in previous researches are lifestyle and commuting activities. This study intends to look comprehensively into the intensity, duration, frequency and

types of activities engage in by university students during their discretionary time and identify those factors influencing their participation in these activities. The scope of this study was limited to South-west, Nigeria because of their relatively similar geographical, cultural and social identities.

Methodology

The descriptive survey research design was used for this study. The population was all 219,662 students of the 14 public owned universities (State: N = 8; Federal: N = 6) in the six (6) states of Southwest Geo-political zone of Nigeria. The sampling was in multi-stage comprising of four stages. In stage one, proportionate and random sampling techniques were used to select 50% of the universities (State: N = 4; Federal: N = 3). In stage two, random sampling technique was used to select 50 % of the faculties, schools or colleges from each of the selected Universities. In stage three, proportionate and random sampling techniques were used to select 50 % of departments in each of the faculties, schools or colleges. Finally, in stage four, purposive and proportionate sampling techniques were used to select all the penultimate and final year students in each department. The penultimate and final year students were selected because they were more accustomed to the LTPA culture in their various universities.

The students were arranged in two discrete groups (males and females) according to their listing on their various university registration lists. This process was adopted to move from general to specific and from wide to small but representative constituent. The total number of wider population in each of the discrete groups being represented were divided by the size required to arrive at the frequency interval that used in picking 10% respondents from each university selected for the study. The sampled female university students' population in final and penultimate classes was 15,114 with 10% totalling 1,511 while their male counterparts were 13, 355 with 10% totalling 1,356. The total for both female and male was 2,876 but an actual sample of 2,730 validly completed this study. Their age range included 16 - 18years, n = 451 (16.5%); 19 - 21years, n = 1139 (41.7%); 22 - 24years, n = 501 (18.5%); 25years and above, n = 636 (23.3%). The sample size for the study was 2,867 university students. The researcher self-constructed instrument tagged, 'Leisure Activity Questionnaire (LAQ),' was used for data collection. The instrument was subjected to a pilot test during which it was administered twice within two weeks' interval using the "test-retest method". Fifty university students from Joseph Ayo Babalola University, Ikeji, Arakeji, Osun State were selected randomly to fill the questionnaire. Two weeks later, the same fifty randomly selected students were made to fill out the same questionnaire. The result showed that Cronbach's Alpha analysis revealed a reliability coefficient of 0.87. To obtain data for this study, the researchers obtained ethical

approval from the University of Ilorin Ethical Review Committee. After enlightenment about the purpose, procedures and benefits of the study, all respondents filled and signed the informed consent form. The IBM SPSS application software was used for statistical analyses of data. Descriptive statistics of

frequency, mean and standard deviation were used for analysis of demographic and LTPA of the participants. Inferential statistics of t-test was used to analyse the influence of gender of LTPA with alpha level of 0.05.

Table 1. Descriptive Statistics Showing Quantity of Leisure-Time Physical Activity Among University Students in South-West, Nigeria

| N/S | Quantity of LTPA | SA | A | D | SD | |
|--------------------------------|----------------------------------------------|------------------------------------|-------------|-------------|-------------|------------|
| 1 | a). Lifestyle activities | | | | | |
| | i. | Walking | 1175(43.0%) | 605(22.2%) | 712(26.1%) | 238(8.7%) |
| | ii. | Climbing Stairs | 422(15.4%) | 1211(44.4%) | 895(32.8%) | 202(7.4%) |
| | iii. | Mowing and raking yard | 321(11.7%) | 877(32.1%) | 1150(42.1%) | 450(16.5%) |
| | iv. | Household Chores | 689(25.2%) | 1306(47.8%) | 498(18.2%) | 237(8.7%) |
| | b). Aerobic activities | | | | | |
| | i. | Jumping rope | 586(21.4%) | 841(30.8%) | 915(33.5%) | 388(14.2%) |
| | ii. | Swimming | 861(31.5%) | 851(31.1%) | 684(25.1%) | 334(12.3%) |
| | iii. | Biking | 404(14.7%) | 902(32.0%) | 977(35.8%) | 447(16.4%) |
| | c). Strength and Endurance activities | | | | | |
| | i. | Jogging and running | 947(34.7%) | 1075(39.3%) | 549(20.1%) | 159(5.8%) |
| | ii. | Racket games and ball games etc. | 742(27.2%) | 962(35.2%) | 783(28.7%) | 243(8.9%) |
| | iii. | Lifting weights of different sizes | 647(23.7%) | 1073(39.3%) | 628(23.0%) | 382(14.0%) |
| | iv. | Aerobic dances | 580(21.2%) | 718(26.3%) | 1072(39.2%) | 360(13.2%) |
| | d). Sedentary activities | | | | | |
| | i. | Reading novels | 768(28.1%) | 1173(42.9%) | 550(20.1%) | 237(8.7%) |
| | ii. | Playing Computer games | 948(34.7%) | 819(30.0%) | 796(29.1%) | 167(6.1%) |
| | iii. | Internet-based activities | 773(28.3%) | 1007(36.9%) | 589(21.6%) | 361(13.2%) |
| | iv. | Watching TV | 790(29.1%) | 1176(42.9%) | 601(22%) | 163(6%) |
| v. | Singing | 968(35.4%) | 828(30.3%) | 664(24.3%) | 270(9.9%) | |
| Quantity of LTPA Cont'd | | | | | | |
| N/S | Quantity of LTPA | SA | A | D | SD | |
| 2 | Intensity of activities | | | | | |
| | i. | Sedentary | 649(23.8%) | 788(28.8%) | 881(32.3%) | 412(15.1%) |
| | ii. | Low intensity | 967(35.4%) | 829(30.3%) | 661(24.2%) | 273(10.0%) |
| | iii. | Moderate intensity | 595(21.8%) | 1110(40.6%) | 841(30.8%) | 184(6.7%) |
| iv. | Vigorous(high) | 606(22.2%) | 961(35.2%) | 876(32.1%) | 287(10.5%) | |
| 3 | Duration of activities | | | | | |
| | i. | Less than 10 minutes | 720(26.4%) | 867(31.7%) | 808(29.6%) | 335(12.3%) |
| | ii. | 10-20 minutes | 643(23.5%) | 640(23.4%) | 1197(43.8%) | 250(9.2%) |
| iii. | Above 30 minutes | 847(31.0%) | 810(29.6%) | 739(27.1%) | 334(12.2%) | |
| 4 | Frequency of activities | | | | | |
| | i. | Once a week on regular basis | 860(31.5%) | 703(25.7%) | 887(32.5%) | 280(10.2%) |
| | ii. | Twice a week on regular basis | 782(28.6%) | 931(34.1%) | 857(31.3%) | 160(5.9%) |
| | iii. | Thrice a week on regular basis | 611(22.4%) | 779(28.5%) | 1072(39.3%) | 268(9.8%) |
| iv. | At least five times a week on regular basis | 673(24.6%) | 648(23.7%) | 1199(43.9%) | 210(7.7%) | |

The analysis of data in Table 2 revealed that respondents were more involved in sedentary activities such as reading novel, playing computer game, engaging in internet-based activities, watching TV, singing, and listening to music with average percentage of (67.7%). This was followed by lifestyle activities (63.5%), another category of respondents who participated in strength and endurance activities such as jogging, running, playing racket games, ball games (61.7%), lifting of weight of

different sizes, aerobic dances etc. recorded (53.8%). Again, data describing the intensity of LTPA among respondents indicated that 52.6% and 65.7% respectively were involved in sedentary and low intensity activity. The results showed that 62.4% of respondents engaged in moderate LTPA and another 57.4% of respondents were involved in vigorous LTPA. The average percentage of moderate to vigorous activity was 59.9%. Table 2 further indicated that 60.6% of respondents were engaged in

more than 30 minutes of LTPA daily, but only 48.3% of the population participated in LTPA for 30 minutes daily for 5 days a week on regular basis.

Table 2. Independent Samples t-test Showing Summary of Gender Influence on the Quantity of Leisure-Time Physical Activity among University Students in South-West, Nigeria

| t-test for Equality of Means | | | | | |
|-------------------------------------------|-------|------|----------------|-----------------|-----------------------|
| | T | df | Sig.(2-tailed) | Mean Difference | Std. Error Difference |
| Gender Differences Equal Variance Assumed | 3.039 | 2728 | .002** | 1.264 | .416 |

Key: Significant $p < 0.05$, there is significant difference

The data in Table 10 indicated that p-value for gender related differences in LTPA is .002 which is less than 0.05. Therefore, one can conclude that there is significant gender

related difference in the leisure-time physical activity among university students in the South-west Geo-political zone of Nigeria.

Table 3. Mean Scores Showing Gender Influence on Patterns of Leisure-Time Physical Activity among University Students in South-west, Nigeria

| Pattern of Participation | Gender | N | Mean | Std. Deviation |
|-----------------------------------|--------|-----------|-----------|----------------|
| | | Statistic | Statistic | Std. Error |
| Lifestyle Activities | Male | 1290 | 11.01 | .068 |
| | Female | 1440 | 10.32 | .056 |
| Aerobic Activities | Male | 1290 | 7.65 | .062 |
| | Female | 1440 | 7.98 | .053 |
| Strength and Endurance Activities | Male | 1290 | 10.98 | .075 |
| | Female | 1440 | 10.75 | .060 |
| Sedentary Activities | Male | 1290 | 14.67 | .091 |
| | Female | 1440 | 13.94 | .079 |

Table 4 showed that the mean score for the male students (11.01) that were engaging in lifestyle activities (walking, climbing, mowing yard and household chores) was higher than that of female students (10.32). However, Table 4 indicated that female students (7.98) participated in aerobic activities (jumping ropes, swimming, biking etc.) more than the male students (7.65). Table 4 further revealed that male students (10.98) were involved in strength and endurance activities (jogging and running, playing sports, lifting of weights of various sizes) than their female (10.75) counterparts. The data in Table 4 demonstrated that male students (14.67) participated in sedentary activities (playing computer games, internet-based activities, washing of T.V. and singing etc.) more than the female students (13.94).

Discussion

The results of the study revealed that university students participated more in sedentary activities such as reading novel, playing computer games, internet-based activities, watching TV, singing and listening to music etc. more than engaging in active lifestyle activities, strength and endurance activities and aerobic activities. In line with this position, Singh and Misra (2015) researched into the pattern of leisure lifestyles among students and discovered that there was a significant prevalence of screen-time activities among students reflecting a large engagement in sedentary activities than physically demanding leisure activities.

Further scrutiny of the results of the present study indicated that 48.3% respondents were able to accumulate on average 30 minutes at moderate intensity daily for 5 days on regular basis. It thus meant that less than half of the university students in the Southwest, Nigeria met the International Physical Activity Guidelines which require individuals to participate in 30 minutes of LTPA daily, at least 5 days a week, on regular basis. The results of this study are in tandem with Judge, Bella, Lee, Petersen, Wanless, Surber, Ferkel and Simon (2012) which reported that about 60% of university students do not on average accumulated five days a week for 30 minutes at moderate intensity in order to achieve maximum health benefits. Likewise, Wattanapisit, Funghongcharoen, Saengow and Vijitpongjinda (2016) found that more than half of students in tertiary institutions have insufficient urban LTPA because of study related activities. In his systematic review on the prevalence of university students' participation in urban LTPA of 19 studies from 27 countries, Irwin earlier in (2007) concluded that more than half of university students were not active enough to gain health benefits of LTPA. The frequency of participation in LTPA has been discovered to lead to positive health outcomes. Hoffman (2013) added that when all factors are equal, increasing the frequency of engagement with critical components of activity usually results in the largest improvement in that activity. Kozechian, Heidlary and Saiah (2012) found significant positive effects of frequency of participation on students' satisfaction with life as a whole and satisfaction with university experience. A number of evidence-based studies indicated that individuals

who engage in LTPA at an adequate level are found to be healthier than people that failed to meet the required guidelines for physical activity (Khalaf, Ekblom, Kowalski, Berggen, Westergren & Alhazzaa, 2013). The import of this study is that university students participated in lifestyle activities, aerobic activities, strength and endurance activities. Truly, Individual can engage in these activities to accumulate the required volume or quality of physical activity that will meet the recommended physical activity guidelines. But, unfortunately, the frequency of participation in these activities among university students in Southwest Nigeria was below the recommended quantity to enable them to attain the health benefits of LTPA.

The low level of participation of university students in LTPA may be caused by factors such as lack of LTPA professionals in Nigerian universities (Adesoye, Ajibua & Ibraheem, 2014) presence of physical environments that are not supportive of LTPA (Jeroh, 2002, Fasan, 2004), inadequate support from significant individuals from within and outside the university community to encourage participate in LTPA among students (Ikhiya and Sosanya, 2002), lack of policy to drive LTPA in academic institutions in Nigeria (Ojeme, 2002), shallowness of Physical Education curriculum in primary and secondary schools (Alla and Olorunisola (2008) and negative attitudes toward LTPA Nigerian universities (Ojeme, Iyawe and Oshodin, 2002).

This results in Table 4 is in tandem with earlier findings of Mota, Santos and Ribeiro (2008) and Bedeli and Moostafazian (2014) who revealed that gender has influence on LTPA engagement. The study conducted by Baranowski (2006) is very relevant in summing up gender-related differences that exist among university students in Nigeria. Baranowski expressed that small differences in self-efficacy, intention, attitudes, social norms, social supports and other constructs as seen between male and female students as revealed in this study may have a drastic impact on their levels of motivation to or not to participate in LTPA. Alluding to this, Telford, Telford, Olive, Cochrane and Darey (2015) found that females have less favourable individual attributes associated with LTPA. So, understanding the factors underlying gender differences in LTPA among university students has potential to guide interventions and programme planning strategies to achieve gender equality in LTPA engagement. In these studies, males were significantly more active than females.

Conclusion

The results of the study indicated that university students engaged in diverse LTPA. Though the intensity, duration of LTPA of students were above average, but the frequency of their engagement in those activities do not meet the international guidelines for physical activity and this will have negative impacts on the health and wellbeing of the students. The results

agreed with previous study that less than half of university students in Nigeria are engaging in LTPA to gain its health benefits. This has serious economic implications for Nigeria in future since these students will form the fulcrum for national work force in future. It is a known fact that health is wealth. The productive capacity of any nation is determined by the physical, social, physiological and mental wellbeing of her citizenry. In another word, healthy people are vital to national economy. The decrease in the level of LTPA among university students portends great danger for the future of the country. There is the need for interventions in Nigerian universities to forestall the calamity that is waiting to happen.

Recommendations

a. Federal, State, local and institutional policies that will encourage urban LTPA among university students should be promulgated and enforced. National University Commission (NUC) should enforce compliance of universities with the policy of Wednesday lecture free for sports and also ensure that the management of various universities organizes their academic programmes in a way that will not interrupt LTPA of their students.

b. Students should be sensitized on the benefits of recreation to the social, physical and emotional components of their lives thus, encouraging and stimulating them to participate willingly in leisure time physical activities

c. University authority should provide facilities and equipment for variety of leisure-time physical activities that will meet the needs and aspirations of students living in the town.

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Discussion on Capital Logic in Marx's Theory and Its Practical Significance

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Abstract: Capital logic is based on the change law of the value of capital in the course of trading in the market, and derives the law of seeking profit maximization and value multiplication. On the one hand, Marx recognizes the historical role of the capital logic at the level of economic means; on the other hand, the capitalism utilizes the capital logic but denies the capital logic. Having a deep understanding Marx's capital logic can effectively promote comprehending the market operation mechanism, which is conducive to the efficient development of productive forces and avoids the logic defect of capital.

Key words: Marx, Capital Duality, Increment of Value

Introduction

The uniqueness of the capitalist mode of production is mainly manifested in the fact that material production, besides being the foundation of human existence, also produces the added value of assets in the process of production. The original demand for human production activities is to consume the products with value in use, but in the capitalist society, it has become an effective way to add value to capital. The inversion of the production means—use purpose indicates that the subjective dimension in the production logic is hidden away, and the new way is to use the dominant production factor to drive the objective material force of the human being, which is generally called the capital logic.

1. Meaning of Capital Appreciation

According to the performance of the capitalist production process, besides the new use value created in the production process, the appreciation of value can be brought to us. In particular, the capitalists invest the original capital to provide the necessary means of production—machine equipment and material raw materials for the production process, which will not bring any excess value beyond the original value. Only when workers spend the labour force on the means of production and convert it into products, and the new value is created in the process. Therefore, capitalists realize the increment of value by paying the variable capital of the workers' wages, purchase the non-variable capital of the means of production, and create new value constantly.

The capitalists pay for the means of production, such as purchasing equipment and raw materials, and the paid wages are

the compensation value of the labor cost. In order to make money, the capitalists will extend the working hours of the workers to the time beyond the compensation for labour-time value. The new value extended by the surplus value is created and wholly owned by the capitalists for free. Marx concludes that the whole process of capitalist production and the accumulation of capital wealth is based on the exploitation of the surplus value of workers.

Marx's capital logic in the capitalist society is not the secret to getting rich, but the unique social production forms that are hidden in the wealth, value, quantity, labor, wage, price and other economic laws. It is not the value principle of commodity function or quantification, but the foundation of social structure and the trend of movement, which makes commodity production, commodity exchange and commodity fetishism. Marx holds that the surface form of capital is the production factor, while in essence it is the production relation, the movement process, the increment of value, the economic power and the deprivation method of occupation. Therefore, Marx's capital logic is the theory of social internal contradiction and human existence dilemma, which is based on the Marx philosophy of human vivid economic reality.

2. Dual Nature of Capital

There are two aspects in the flow of capital. On the other hand, the capital shows the wanton pursuit of the overflow of value; on the other hand, it can create a rich material basis to meet the needs of society. Obviously, the above expression exaggerates the civilization of the capital, increases and beautifies the moral advance of the capital logic, conceals the capital essence of pursuing benefits and exploiting workers.

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With the dual combination of production relations and material production factors, the labor production relationship in capitalism is materialized. The pursuit of value-added production relations, whether in the market or in the labor and employment relationship of the surplus value, is represented by the occupation relationship of social relations among people and mediated by the capital as the material production element. The law of contradiction in material production relations is enforced by the movement of material means of production. Thus the capital logic gains the form of “logic of things” that are not transferred from the will of the person.

Although the capital logic has obvious the manifestation of the object form, it is not only the expression law of natural material, but the law of capitalism social history which is enforced by the objects in the natural law. According to the concrete manifestation of two connotations in the process of production, one is the labor process that produces the use value, that is, the material wealth that satisfies the needs of people; the other is the value-added process with the capital as the basis and self-appreciation as the motive and purpose. For the value-added control of the labor process, the labor process becomes a kind of value-added operation means. In essence, capital logic is the binary logic of the exploitation of human beings through things. Therefore, at the same time of affirming the great civilization of capital, Marx attacks the oppression nature of capital civilization sharply. Capitalism has freed people from the natural need of “blindness” and feudal attachment, and has ruled the human beings in the relationship of materialization. Therefore, the liberation of people under the capital ruling is the transformation from “capital civilization” to “people’s free development”.

On the one hand, because of the reversal of the characters of the nature of the capital logic, the state capital civilization has its “evil”; however, in Marx’s view, the capitalism is not completely “evil”, in the kindness and evil, there is a path from evil to kindness. The civilization pattern of capital produces freedom and liberation in the cruelty and slavery. The historical movement of the capital logic changes its original form, and also makes the capitalist society face the reform in the change of the times.

3. Realistic Influence of Capital Logic

3.1 Cultural Influence

Under the control of capital logic, all other factors are the elements of capital except that human beings and capital are in opposition. Whether the progress of civilization or the development of productive forces shows the degree of development of capital; however, it is not the rich of workers. As Marx has said: “the progress of civilization will only increase the power of the men ruling workers”. In the civilized society under the capital logic rules, people are more limited and one-sided. Capitalism has freed people from the natural need of

“blindness” and feudal attachment, but also has ruled people in the relationship of materialization. Therefore, the liberation of people under the capital ruling is the transformation from “capital civilization” to “people’s free development”. This process involves in the contradiction of capital logic trend; on the level of capital civilization, capitalism shows that the condition of capitalism and the means of capital appreciation are more conducive to the development of productive forces and the development of social relations compared to the past social formation. It is conducive to creating a higher level of new elements. It is these conditions that establish a realistic basis for the establishment of a more advanced social formation based on the overall free development of everyone.

Labor is alienated from the capital logic, and the powerful constraint of the capital force limits the development of human beings. In the first place, people are constrained by the capital logic and become capital-added tools. Capital makes the “natural power” develop without limit, which makes machines become more and more extensive in the field of use, and its division of labour becomes more and more refined. Many complex and sophisticated techniques are broken down into a number of simple and tedious assembly, and people in the process of decomposition bear the responsibility of repeating a single job and lose their own subjective consciousness, turning into “screw nails” in the flow operation to be dominated and oppressed without limit by the capital and severely restricting the development of human beings. Secondly, the capital logic makes people increasingly lose their freedom and themselves. Capital expansion requires people to be more professional. A special division of labor limits workers’ shrinking development space. Capital expansion has impeded the overall development of human beings. Workers are gradually becoming part of the process, losing freedom and themselves. Workers don’t affirm themselves with work; in the contrary, they increasingly deny themselves. They are unhappy and miserable. Their strength and intelligence are not free to do in their work, but they suffer physically and mentally. As a result, workers feel comfortable after their work, and they are uncomfortable in their work. Besides, under the logic of capital, the labor relation is completely alienated. Capital has the control and command of the workforce. As a personalized capital, the capitalists supervise the workers to work in a limited labor intensity. Limited by the signed contract, workers can only obey it.

3.2 Political Influence

Capital can come to China because the capital logic seeks profit-oriented guidance, especially the demand for profit capital. Under the power of strong development in China, the long-term fund face a shortage. As a developing country, China urgently needs to achieve the goal of modernization at an early date. But for a developing country seeking reform and opening up, from the beginning of the modernization, in the capital era of

globalization, in the face of the strong pressure of the western developed capital market and the capital logic, China is eager to change the backward state; capital factor endowment and capital accumulation are required. Therefore, the introduction of foreign capital has become an effective way to realize modernization goal in China.

In the fierce market competition, capital integrates natural science, development of machine system and effective management technology into production process, which greatly improves labor productivity and creates the material foundation for the realization of scientific socialism. The basic premise of the communist society in the future is the great abundance of material wealth. Compared to the past, the capital has greatly promoted the development of social relations. Capital has created a social stage, compared to which, the social phase of the past is only manifested in the local development of human beings and in the worship of nature.

3.3 Economic Influence

As the economic means, the capital logic promotes the acceleration and development of the social productive forces, promotes the progress of human civilization and expands the market, and forms the history of the world and the world's citizens. However, the rationality, legality and frontality of the capital logic are limited to the market. If the capital logic goes beyond the limits of the market, the logic of capital goes to the opposite, people's criticism and denunciation.

The essence of capital is the overall trend of capital financial virtualization, which is the symbol of the contradiction in the capital logic. The characteristics of these virtual capital enable capital to aim at the stock market with a long history under the pressure of residual absorption. Under the initiative of the "financial liberalization" of the main capitalist countries, the financial capital with considerable material and technological conditions quickly controls the world economic system, and gains more space for its own appreciation. Capital finance has produced the logic of financial capital, which is the special expression of capital logic in contemporary capitalist movement. The logic of financial capital includes two aspects: on the one hand, the objective law of financial flows is formed by the self-movement of virtual capital in the financial system. On the other hand, the relationship between financial capital and industrial capital forms the law of capital flow.

Conclusion

For the Marxist researchers, only when the dual connotation of the capital logic is clearly defined, can they exploit the modernity of the Marxist philosophy effectively, reproduce accurately the social reality in the history and truly discover the criticism old world and new world. China's use of capital is very risky, and if there is no moral restraint and regulation of capital, there will be the same capitalism problem "overlabour" under the push of market demand, competition pressure and capital logic. Try to reduce the potential negative influence, which is a major theoretical and practical problem brought forward by the era of capital globalization to the socialism with Chinese characteristics.

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An Assessment of Models for Market-oriented Ecological Compensation Mechanism of an Application to the Middle-Yangtze-River Economic Region in China

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Abstract: As the middle-Yangtze-River region in China has enjoyed economic growth, rapid environmental changes are beginning to constrain economic development. The establishment of an ecological compensation mechanism may help align economic and ecological goals. This paper introduces the theory and practice of ecological compensation mechanisms, reviews prior applications, and explores adaptations needed to build an operational model of market-oriented ecological compensation mechanism in terms of basin, forest, natural reserves and mineral resources in the middle reaches of the Yangtze River.

Key words: Middle-Yangtze-River economic region, ecological compensation mechanism

Introduction

With the growth of China's economy, environment deterioration is beginning to affect the prospects for further growth. One strategy to address emerging conflicts between economic interests and long-term societal prosperity and environmental health is to establish a compensation mechanism by which the damages done to ecological systems are quantified and the appropriate resources are diverted to improve these systems or establish new habitat with corresponding ecological function or quality (Moreno, et al., 1998, Cuperus & Canters, et al., 1999).

Wu and Boggess (1988) established a framework for the design of ecological protection programs and studied how to administer a regional allocation of ecological protection funds. Larson (1994) set up the first rapid model for the evaluation of wetlands to help government to issue licenses for the compensation of wetland development. The Dutch government considered the principle of ecological compensation as one of the factors to inform road construction, providing ecological compensation to restore ecological functions and natural property (Cuperus, Canters & Annette, et al., 1996). Johst designed a set of ecological economic simulation programs to calculate the funds needed to protect white stork populations from changes in land use (Johst, Drechsler & Watzold, 2002). McCarthy studied the economic determinants of private afforestation in the Republic of Ireland and quantified the influence of competitive forestry and farmer policy on private

afforestation by means of regression analysis (McCarthy, Matthews & Riordan, 2003). Herzog explored the influences of ecological compensation areas on the diversity of birds and plants in an agricultural landscape (Herzog, et al., 2005).

Considerable successes in river basin development and management have been achieved, for example, for the Tennessee River by using some of the profits from electric power generation (He, 2006). Similarly, an ecological service compensation model has been used to support afforestation in the upper reaches of a basin through funding from Costa Rica's hydropower company. In the US, owners of land and grassland around basins can be compensated through a program of land retirement (Heimlich, 2002). More generally, environmental service compensation has been perceived as an effective way of internalizing social and environmental externalities (Gouyon 2003), with the government functioning like a buyer of ecosystem goods and services (Kumar 2005) and incentivizing ecosystem protection.

The ecological compensation mechanism aims to protect the environment and promote the harmonious development between human beings and nature and also adjusts the public system of the interests among stakeholders of the ecological protection. Much of the empirical and policy work has been carried out for the Americas and Western Europe, and the approach is just now catching on in China as well. To ensure its success, China's use of the ecological compensation mechanism needs to be established in ways that are sensitive to its unique relationships between rapid changes in rural and urban areas, and

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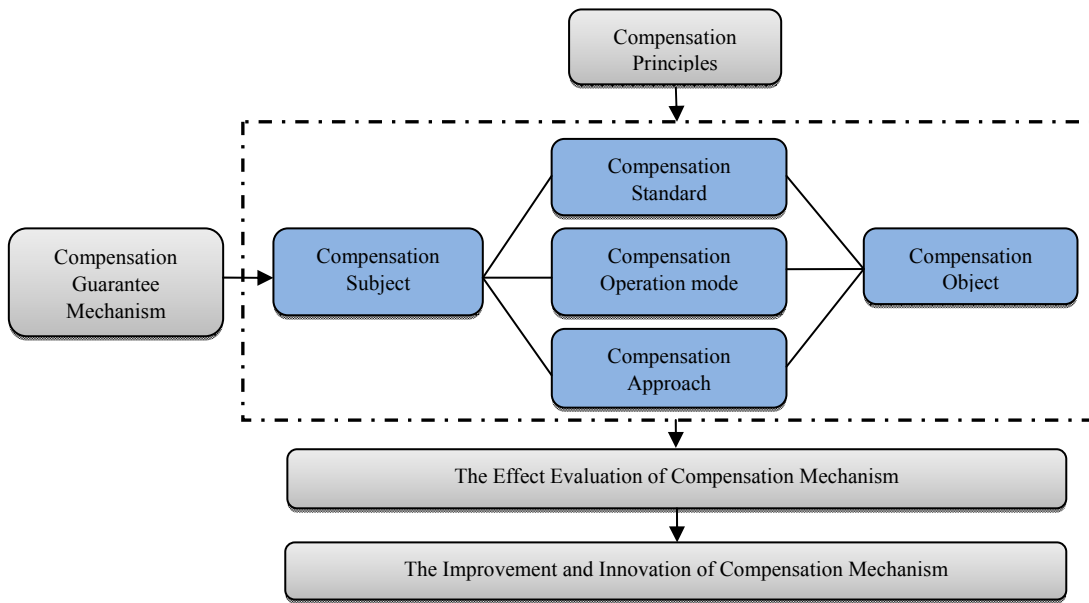


Figure.1 The Process of the Ecological Compensation Mechanism

2. The research area and its situation

2.1 Research area

The middle-Yangtze-River economic region of China is set forth in the China’s National Planning for the New Mode of Urbanization (2014-2020) issued in the March 2014. It consists of Wuhan city cluster, Changsha-Zhuzhou-Xiangtan city cluster, Poyang lake city cluster and economic development zone in Jianghuai region with Wuhan, Changsha, Nanchang and Hefei as the core. It is located at the heartland of China’s mainland and has an important role in the social and economic development in terms of ecological service with expansive river basin, huge forest areas and abundant natural resources. It accounts for 7.3

% of the total area included Hubei province, Hunan province, Jiangxi province and Anhui province, of which more than 230 million people inhabit in an area of around 298,400 km², taking up around 17 % of the total people in China. The GDP in this economic region in 2014 is 90.97 billion RMB, making up 14.3 % of the total national GDP. Nowadays, this economic zone has increasingly strengthened the ecological environmental protection with taking the basin, forest, mineral resource and natural reserves as the first priority and established an ecological compensation mechanism to strive for the harmonious development of the stakeholders concerned.



Figure.2 Location of the study area, the Middle reaches of the Yangtze River

| Provinces | Area (km ²) | Water Resource (100 million cu.m) | Forest Area (km ²) | Nature Reserve (unit) | Area of Nature Reserve (km ²) | Solid Mineral Resource (10000 Tons) |
|-----------|-------------------------|-----------------------------------|--------------------------------|-----------------------|-------------------------------------------|-------------------------------------|
| Anhui | 139427 | 585.59 | 38042 | 104 | 5240 | 14846.56 |
| Jiangxi | 166900 | 1423.99 | 100181 | 199 | 12460 | 18801.52 |

| | | | | | | |
|-------|--------|---------|--------|-----|-------|---------|
| Hubei | 190000 | 790.15 | 71386 | 70 | 10190 | 7656.68 |
| Hunan | 211829 | 1581.97 | 101194 | 128 | 12840 | 5175.97 |

Table.1 The Main ecological resources in the Middle reaches of the Yangtze River

2.2 The situation of ecological compensation

The Basin

The essence of the basin ecological compensation mechanism is the reallocation of the interests of the upper and lower reaches of basins, which can effectively solve the conflicts between the development and protection of the basin ecological environment. To optimize the overall interests of the basin, every province in this economic zone should target at the key basin to actively explore and establish an ecological compensation mechanism. Hubei province has set forth an ecological compensation mechanism for the south-to-north water diversion project to promote the coordinate development of the economy, society and ecology of both the water transferring and receiving regions (2008). Anhui province has made Dabie Mountain, Hui River and Qingge River as the pilot to implement the program of ecological compensation mechanism in June 2013. Hunan province has officially implement the Regulations of the Protection of Xiangjiang River of Hunan Province and established a boundary responsibility and ecological mechanism for the water quality of the cross section of the administrative area of the upper and lower reaches of Xiangjiang River(2013). Deng Hui, the delegate of national people's congress of Jiangxi province, has suggested that it should make cooperation with Guangdong, Shenzhen and Hong Kong to establish a across provincial basin ecological compensation mechanism.

The Forest

The maintenance of the forest ecology provides important ecological service function. The forest ecological compensation mechanism means that it takes the stakeholders of ecological service as subjects and offer compensation mechanism for the objects who are directly suffered by giving up the development opportunities and economic interests for the protection of the forest ecological environment. The four provinces in the central China have abundant forest resources, of which the forest coverage rate of Jiangxi and Hunan provinces are both more than 50 %. Hubei province has gradually promoted the implement of the pilot program of compensation funds and insurance to expand a new way of forest ecological compensation (2011). Anhui province has implemented several policies of ecological compensation and taken leader in the definition of public welfare forest (2010). Hunan province has aimed at forest ecological compensation to gradually raise the standards of the ecological compensation and distributed the compensation funds to the forest maintenance of subjects (2007). Jiangxi province has put the forest protect in priority and made integrated control of the national and provincial compensation funds and made efforts to the self-examination and self-correction to ensure the efficiency of compensation funds

(2013).

Mineral Resource

The ecological compensation of mineral resource refers that enterprises and governments should provide funds and rehabilitate the ecological environment damage caused during the development of the mineral resource. The central China is rich in mineral resource with the mineral resource reserves accounting for more than half of the national total in terms of coal, bauxite, phosphate and rare earth. The development and application of the mineral resource strongly promote the economic growth of this economic zone. However, they also seriously destroy the ecological environment of this region. Hubei province has suggested that the central government, local governments and enterprises cooperate with each other to support the establishment of a lasting effective mechanism for the management of the ecological environment miner regions (2007). Anhui province has further established the Supplementary Provisions Regarding the Use of the Deposits for the Geological Environmental Protection and Management in the Mineral Regions of Anhui Province to allow the deposit to play a better role in the protection and management of geological environment in mineral regions (2011). Hunan province has defined the obligation of the management of the mineral environment and the ecological rehabilitation to improve the ecological compensation mechanism to the mineral resource (2012). Jiangxi province has started to make a program of the environmental protection and rehabilitation of the mineral geological environment to promote the implement of the deposit system for the mineral environmental management and ecological rehabilitation (2010).

Natural Reserve

The ecological compensation mechanism of natural reserve means a mechanism that considers the ecological program which is established to promote the establishment of the ecological project in the reserves and to limit the production and life of human beings and the vulnerable people as the objects. According to China's latest list of natural reserves of every province, the natural, provincial and county level of natural reserves of Hubei, Anhui, Hunan and Jiangxi province are 70,104,128 and 199, respectively. At present, the main resource of the compensation funds for environment reserves in every province in the central China are from the national and local finance, except that Hubei province has approved a specialized compensation regulation Interim Measures of ecological compensation to the wetland natural protection in Wuhan City that clarified that it is the municipal and district government who should compensate the farmers who lost their benefits because of the construction of natural reserves.

3. The analyses of the marketization of the ecological compensation mechanism of the middle-Yangtze River-economic region

The important ecological environment with basin and forest as well as the natural reserves included in the middle-Yangtze River-economic region are challenged by the decreased scope and worsening environmental pollution and species decline resulting from the human activities. However, the existing ecological compensation mechanism in the central China with considering the government as the subject has many defects such as the ambiguity of power and duties, the narrow source of fund raising mode and lower standards. It is imperative that a market-oriented ecological compensation mechanism should be established to achieve the sustainable development of the

economy, society and ecology in central China.

3.1 The ambiguity of rights and duties of the compensation subject

As the ecological products are considered as the public products, the ecological beneficiaries are with the awareness of the free consumption, lack of the sense of fulfilling of his compensation obligation. Generally speaking, the subject of the ecological compensation is supposed to be the behavior subject of function of the consumption of ecological environment service, including governments and enterprises and individuals (Yu, 2013). The ambiguity of power and duties leads to the various free ecological services, violently affecting the establishment of the market-oriented ecological compensation mechanism.

| Compensation Area | Existing Compensation Subject | Provinces | The lacks of compensation subjects |
|-------------------|-----------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| River Basin | Central and Local Government | Hubei/Jiangxi | Upper and lower reaches Local Government/Lower reaches Residents/Farmers and Fishermen/Water supply corporation/Polluting enterprises etc. |
| | Central and Local Government/ Upper and lower reaches Local Government | Anhui/Hunan | Lower reaches Residents/Farmers and Fishermen/Water supply corporation/Polluting enterprises etc. |
| Forest | Central and Local Government/Enterprise and individuals who occupied and used the forest land | Hubei/Hunan/ Anhui/Jiangxi | The enterprises, organizations and individuals who enjoy the forest resources service/Forest Park/Scenic Spots etc. |
| Mineral Resources | Local Government/Mining Enterprises | Hubei/Hunan/ Anhui/Jiangxi | The subject who was processing, sale and consume the mineral resources /Environmental beneficiary |
| Nature Reserves | Central and Local Government | Hubei/Hunan/ Anhui/Jiangxi | Nature Reserves/Tourist/Tourism enterprise/Beneficiaries who enjoy the eco-resources services |

Table.2 The problem analysis of eco-compensation subjects in Middle Reaches of Yangtze River

3.2 The imperfect classification of the compensation objects

The object of ecological compensation refers to the environmental system providing ecological service function and those groups and individuals who make contributions to the ecological environment protection or lost their self-interests and development opportunities because of the environment protection (Yang, 2010). The definition of the compensation objects in terms of basin, forest, mineral resource and natural

reserves in every province are undue and those who devote themselves to the ecological environmental protection fails to be compensated in a just and reasonable manner in accordance with the present situation of the ecological compensation in the middle-Yangtze River economic region. It reduces the interests of compensation objects to take participate in ecological construction, hindering the establishment of the marker-oriented ecological compensation mechanism.

| Compensation field | The problem of the definition of Compensation object |
|--------------------|--------------------------------------------------------------------------------------------------------------------|
| River Basin | (1)The scope of compensation basin not being in full, with only included the provincial main stream. |
| | (2) Not including the provinces of river basin upstream. |
| | (3) Neglecting the damages of compensation subject's developed opportunities. |
| Forest | (1) Failing to cover the surrounding forest ecological environment into the compensation scope. |
| | (2) Only covering the shelter forest and forest for special use into the public welfare forest compensation scope. |
| | (3) Not including the organizations and individuals who protect the forest and lose their profits into the |

| | |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | compensation scope. |
| Mineral Resources | Failing to cover the organizations and individuals who lost their ecological and economic interests because of the develop of mines into the compensation scope |
| Nature Reserves | (1) Not covering the organizations and individuals who make a great contribution to the nature reserves into the compensation scope. (2) Not clearly defining the organization and individuals who lose their profit resulting from the establishment of the nature reserves. |

Table.3 The problem analysis of eco-compensation objects in Middle Reaches of Yangtze River

3.3 The narrow source of compensation mode and funds

Nowadays, the ecological compensation of the middle-Yangtze-economic region to the basin, forest, mineral resource and natural reserves mainly depends on the transfer payment of the governments. This government-oriented compensation mode is not able to exert the influence of market-oriented mechanism and has a series of defects. First of all, the limitation of national finance is not conducive to the mass, the receivers of the ecological environmental service, to take initiative to fulfill the obligation of ecological compensation, because the funds needed for the investment of every provincial ecological environment is too huge. Secondly, governments are frequently in dilemma at the aspect of standards of transfer payment because of the lack of market price of ecological resource, affecting the efficiency of the ecological compensation.

In addition, the ecological compensation in the central China largely depends on the funds and material objects as the most direct economic compensation to the local region and residents. However, this “blood transfusion” compensation is sure to be short-term and cannot fundamentally solve the issue of the protection and rehabilitation of the ecological reserves (Zhang, 2009).

3.4 The unscientific compensation standards

The definition of compensation standards needs to reference the following aspects in general: the input of the ecological conservationists, the loss of opportunity cost, the benefit of ecological stakeholders, and the rehabilitation cost of ecological destruction and the value of ecological system service.

| Compensation Area | The Basis of Existing Compensation Standards | Problems |
|-------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| River Basin | Water quality monitoring (COD/Ammonia nitrogen/CODMn)* | The unity management of compensation funds and different evaluation requirement on each river basin; The loose evaluation of water quality without immediacy; The shortage of further definition of Compensation standard, even with the problem of “one size fits all”; The Lack of taking the protection of investment, ecological benefit and service value into consideration. Low Compensation standard with only 90 Chinese Yuan*for per acre forest; |
| Forest | Management and basic protection of public welfare forest | Failing to make a reasonable compensation standard and value accounting system according to the actual situation of the economy and tree species in different provinces. Not taking the fees of environmental rehabilitation and the damage of the ecological function as a compensation standard. |
| Mineral Resources | Resources yield and Mining rights price | Not considering the impact of environment damage on the offspring and surrounding residents. Not considering the difference between the local economic developments. |
| Nature Reserves | Reserves development and management fees | Not considering the loss of organization and individuals because of the development of the nature reserves as a compensation standard. |

*COD: Chemical Oxygen Demand; CODMn: Permanganate index;

*1 US Dollar=6.60 Chinese Yuan(Exchange Rate in 2015-12-30).

Table.4 The analysis of the problems of eco-compensation Standards in Middle Reaches of Yangtze River

4. The mechanism and operational mode of ecological compensation in the market

4.1 The ecological compensation mechanism in the market

That the market takes participant to the ecological mechanism origins from the motivation of “broker” and from the extra needs of ecological public materials of partial consumers. Economics believes that it is the supply and demands that constitute the elements of operational mechanism and that market transaction must be on the basis of the voluntary choice of the market price mechanism. The “brokers” as the subject of supply are willing to provide ecological public materials on condition that it can bring well-being to them on the basis of the

increase of the social profits. Consumer subject would like to “buy” ecological public materials of which they have extra needs though the operation of market. The combination of extra needs of consumers with the motivation of “brokers” makes the market mechanism of the ecological public materials possible. The restrict conditions of the market to the efficiency of the ecological compensation mechanism is the clearness of the property of the ecological resource. Therefore, governments should make a clear definition to the material property and establish and improve the economic legal system at a national level. Thus, the effective supply of materials can be of great possibility and the needs of people to the ecological public materials met (Zhang, 2009).

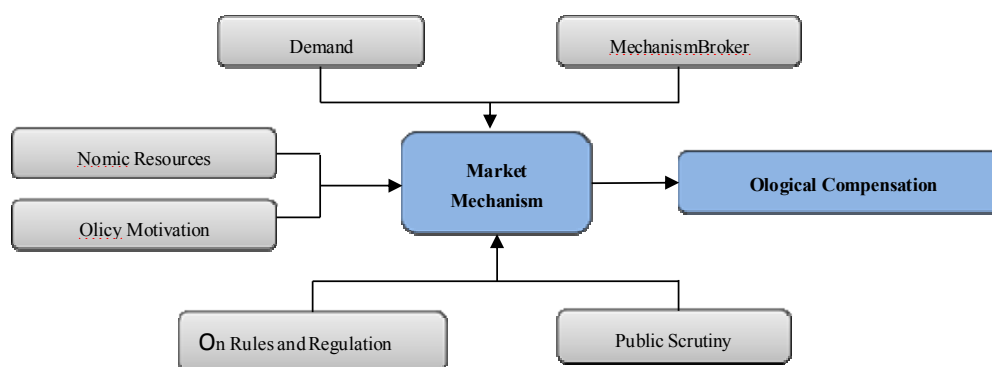


Figure.3 The Market Mechanism in the Ecological Compensation

4.2 The main existing operational mode of the market-oriented ecological compensation mechanism

Market compensation is that the beneficiary of ecological service directly compensate to the ecological conservationist though the market compensation and is one of the most effective ways for the governmental compensation as well as the main direction of the innovation of the ecological compensation mechanism. The market compensation has the characteristics of directness and diversity and has the advantages of a wide funds

resource and low operating cost of mechanism but it also has some disadvantages, such as the huge difficulty of the implement of compensation and the obviousness of short-term behaviors. Therefore, it is applicable to the ecological compensation programs with a small scope, collective compensation subject and a clear definition of the property. To be specifically, it is suitable to compensation of the private transaction organized in a spontaneous manner, to the open market trade and to the ecological mark (Fu, 2009).

| Type | Concept | Characteristic | Application Fields |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Market trade (Open trade) | Based on the environmental public standards defined by the government or public sectors, the compensation is made through the free-market trade. | Environmental services being standardized into the commodities which can be separated and traded forms; being able to establish a market transaction system and rules. | Payment for environmental service and Carbon sequestration project |
| One by one trade | Market compensation by self-organization | Small compensation scale and relatively fewer beneficiaries of eco-environmental services with a clear definition; The amount of providers of eco-environmental services being under control. | Between the upstream and downstream of a specific basin and between the water source and user area of drinking water. |
| Eco-mark | Being able to provide credible | The credible authentication service | General environment-friendly |

| | | |
|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------|
| authentication service for products produced in ecological environment-friendly way; Indirect compensation. | for the Ecological products, including the compensation to the sustainable production and development ways. | market goods. |
|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------|

Table.5 The basic types of the operational mode of market eco-compensation mechanism

5. The operating mode of market-oriented ecological compensation mechanism in the middle-Yangtze economic region

The ecological compensation mechanism can be divided into the following types in accordance with the actual situation of four provinces in this economic region: the mode of basin ecological compensation, the mode of ecological compensation of natural reserves and forest park, the mode of the ecological compensation of development of mineral resource (included with the coal resource-typed ecological compensation mode) and the mode of agricultural ecological compensation from the perspective of land use.

5.1 The mode of basin ecological compensation

It refers to that the lower reaches of a river, in order to meet their demands of water quality, compensates the cost of

ecological construction of upper reaches of this river where it has taken measures to protect and rehabilitate and establish ecological environment by means of materials and funds, intelligence and policy. It is applicable within the middle-Yangtze economic zone such as Yangtze River valley, Yellow River basin, Hangjiang River basin and Xiangjiang River basin. The ecological beneficiaries in the basin include the subject of water for production use, of water for commercial use and of water for ecological use and residential use, which constitute the whole beneficiary of basin ecological service. All these subjects except for the subject of water for ecological use which is suitable to the government-oriented compensation are able to adopt the policy of market-oriented ecological compensation according to the principle of “who protect, who benefit; who benefit, who pay”.

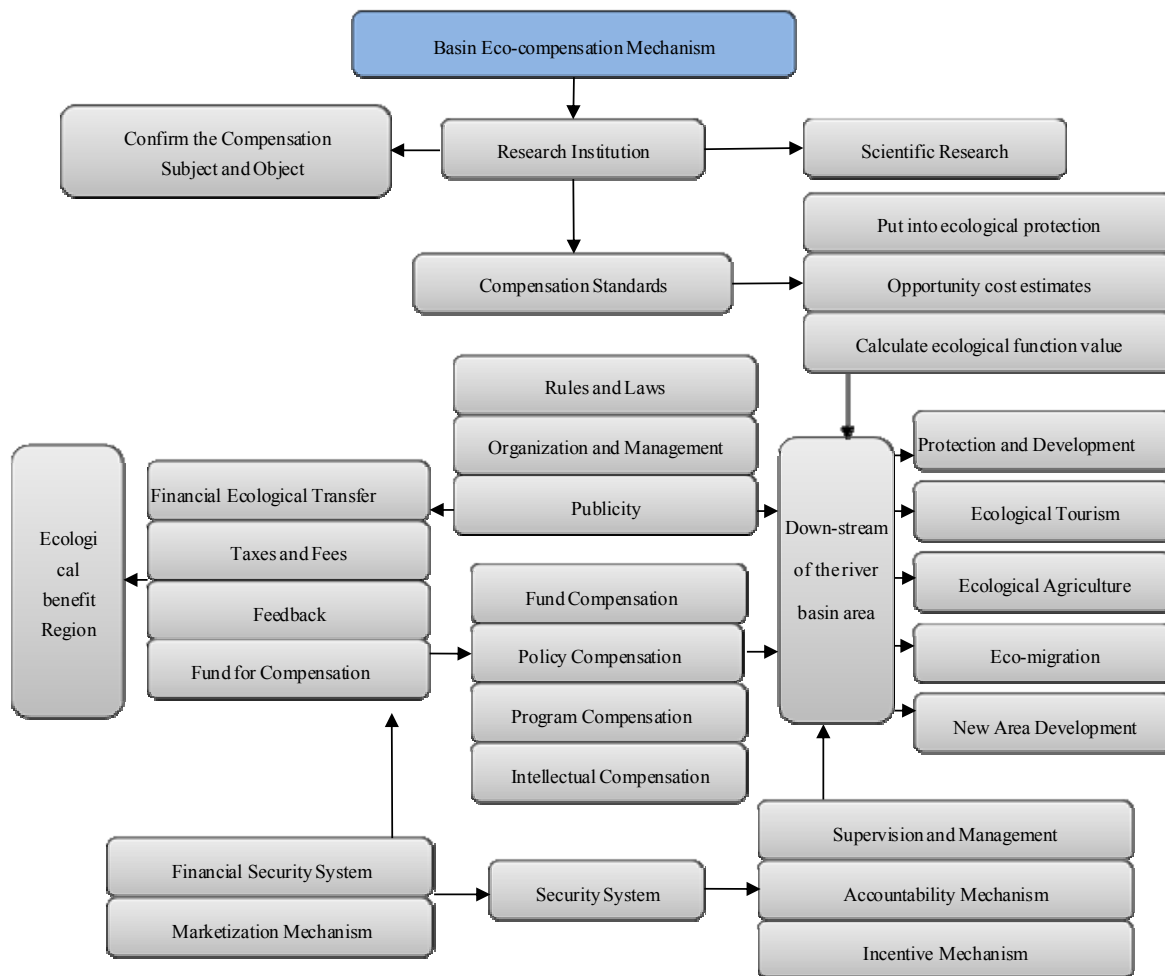


Figure.4 Schematic Diagram for basin Ecological Compensation Mechanism

5.2 The operating mode of ecological compensation mechanism of natural reserves and forest park

The natural reserves and forest park belong to an area divided in accordance with the law where it is granted with special protection and management and in general are composed of the typical natural ecological system, natural distribution area of the rare wild animal and plant species and the regions with such protection targets as the special natural relics. The co-existing ecological compensation mode of “the type of blood transfusion” and “hematopoietic type” can be established for this area whose basic framework is to establish two organizations in these four provinces in this economic region, the ecological compensation foundation for natural reserves and forest park and

the development committee of natural reserves and forest park. The former will be in charge of the reception of financial support concerned, of the imposing of the ecological compensation tax, of the issue of the lot of ecological compensation funds and the gathering of their own compensation funds. The other takes the responsibility of the plan of natural reserves and forest park, of the management of ecological compensation funds and the balance of the interests among stakeholders, of the guidance of the management committee of natural reserves (or the management committee of forest park) regarding the appropriate self-compensation and the publicity of the awareness of compensation(Kong,2012).

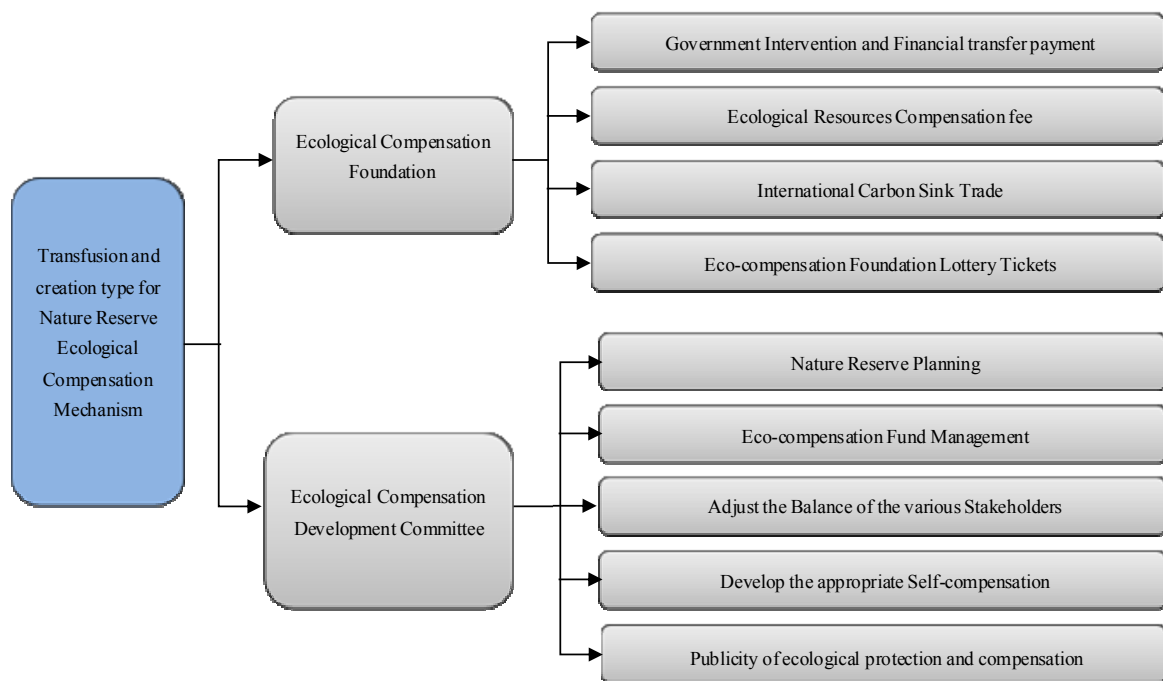


Figure.5 Schematic Diagram for Nature Reserve Compensation Mechanism

5.3 The operating mode of ecological compensation mechanism for mineral resource

Ecological compensation to mineral resource is the assembly activities of funds support, financial subsidy, tax exemption and preferential policies granted by the government for the governance, rehabilitation and regulation of a series of such problems as the damage of natural resources around the mine regions, the pollution of ecological environment and the loss of sustainable opportunities of the mining cities that result from the development and utilization of the mineral resources of the mining enterprises. The core issues of the ecological compensation mechanism for the mineral resource are to find out the person in charge, the person who pays, the terms of payment and the amount of compensation. It should be compensated in

the following four aspects. Firstly, the enterprises in mines should compensate the state (the ownership of the mineral resource) if the reusing of the mineral resources are damaged resulting from the legal development of the mineral resources. Secondly, the enterprises in mines should compensate the residents if the environment around the mines is polluted by the legal development of the mineral resources. Thirdly, the enterprises in mines should compensate the “offspring” if the sustainable utilization of the mineral resource is damaged because of the excessive development of the mineral resource. Fourth, other industrial cities should compensate the mineral cities if the loss of the cost of investment in a mineral city is caused by the unreasonable price of the mineral resource (Meng, 2010).

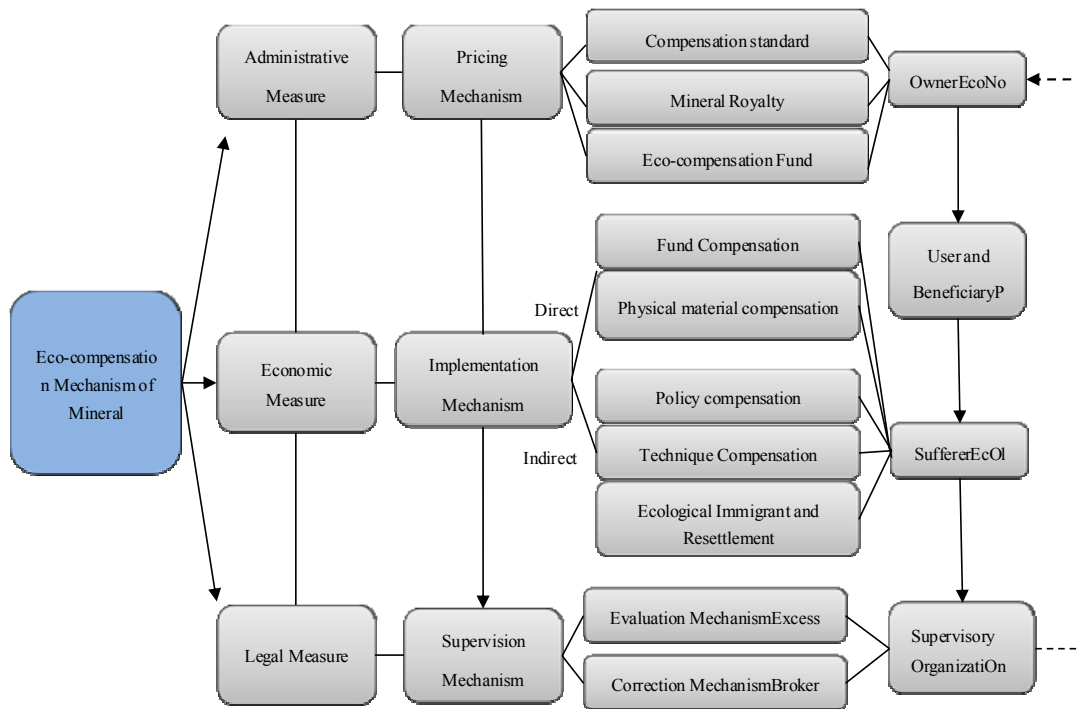


Figure.6 Schematic Diagram for the Operating Mode of Ecological Compensation Mechanism of Mineral Resources

5.3 The operating mode of ecological compensation to farmland from the perspective of land use

The compensation to farmland which is also named the cultivated land can be called the compensation to cultivated land. The ecological compensation to farmland from the perspective of land use is to make the economic punishment to the those which lead to the decreased ecological quality of farmland and make a economic compensation to those healthy behaviors that has enhanced the ecological quality of farmland in accordance

with the principle of ecological compensation as farmland tends to be affected by the land use. The middle-Yangtze economic region, as an important database of the production and storage of grains in China, covers a large area of cultivated land. Therefore, the establishment of the mode of ecological compensation to farmland is helpful to the improvement of the production of grains and to the encouragement of the farmers' production of enthusiasm.

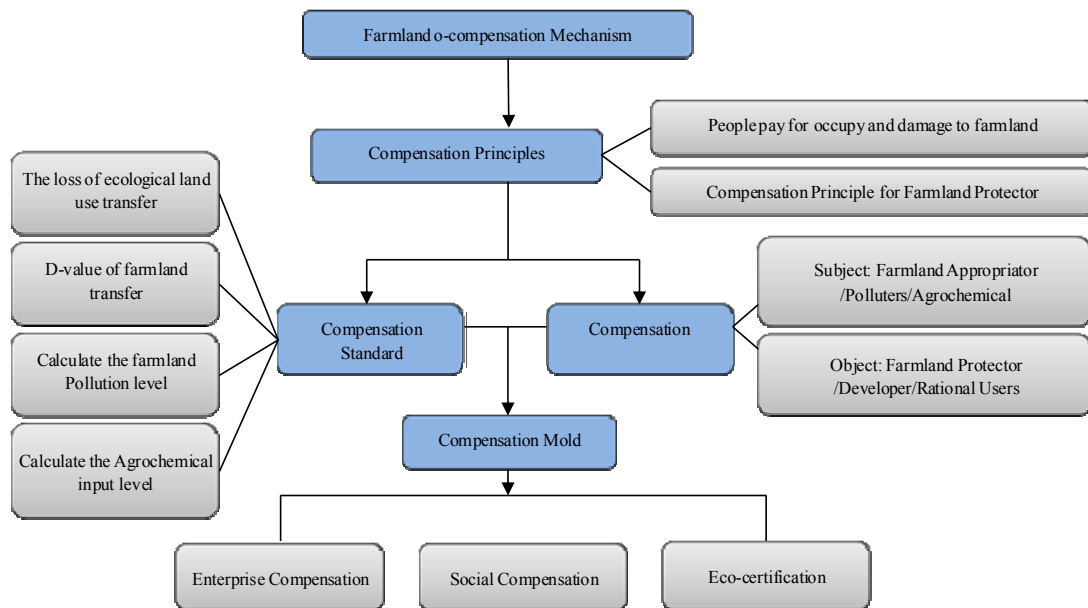


Figure7. Schematic Diagram for ecological compensation mechanism to farmland from the perspective of land use

6. Policy measures

6.1 Improving the ecological compensation legal system

China should make comprehensive laws and regulations for the market-oriented ecological compensation as soon as possible so as to make a comprehensive and systematic stipulations to the market-oriented ecological compensation in terms of the basic principles, main field, scope of compensation, subject of compensation, compensation standards, fund collection, the division of labors and job duty as well as the monitoring and evaluation of the compensation. Meanwhile, every province should make rules and regulations which are adoptable to the local conditions in accordance with the national comprehensive laws and regulations

6.2 Increasing the investment in the market-oriented ecological compensation

It is suggested that the weight of the influence factor of market-oriented ecological environment and the support of key frail environmental zone and environmental protection zone should be increased in the finance transfer payment and the vital ecological areas and ecological elements should be bought by countries according to the fair principle of public service and a lasting effective input mechanism should be established in the key areas of the ecological construction for the economic development, enhancement of the livelihood of farmers and herdsman and the sustainable development of local economy and society.

6.3 Strengthening the information network of ecological compensation service

A team of comprehensive information service talents is needed who know how to not only collect and analyze and process information but serve for the information customers. In addition, it is indicated that information related to the ecological service should be added to or connected with such network as "Farmers' Network" so as to make the all-round information service available to the ecological areas. The system of transaction platform connected with international norms should be improved with the reference of national experience.

6.4 Supporting the development of ecological industry with local characteristics

It should support the development of ecological agriculture featuring pollution-free, green and organic farming and help the growth of green processing industries with energy conservation and less environmental pollution and strengthen the development and plan of ecological tourism in every province. Efforts to the encouragement and expansion of the scope of the non-farm employment of farmers should be made based on the protection of ecological resource.

6.5 Enhancing the awareness of ecological compensation of all people in China

It should make the awareness of "Who Develops, Who

Protects, Who Benefits, Who Compensates" popular among people by further promoting the ecological compensation so as to guide the whole society to establish the conception that the ecological products is not for free and protecting the ecological environment is everyone's responsibility for the creation of atmosphere of appreciating environment and protecting ecology.

6.6 Making the exploration and pilot of diversified market of ecological compensation in an active way

Efforts to the use of compensation ways, such as the carbon-sink transaction, emission trading, water right trade and service identification of ecological products, should be actively made to explore the diversified market-oriented compensation mode for expanding the financial channels. Testing pilot of ecological compensation to the basin and water resource in the Dongting Lake, Pongyang Lake and Dongjiang River should be conducted. Pilot projects of ecological compensation to water resource also should be made in the region with serious soil erosion. It should establish a demonstration zone of land reclamation in the typical mine subsidence area and make a pilot project of ecological compensation to the cultivated land and soil in some areas with certain conditions.

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On the Dimensions of Urban Ecology Research

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Abstract: Urban ecology, which studies urban structure, function and dynamic coordination in ecological theory and methods, is a branch of urban science and ecology. Urban ecology is in the junction of natural science and social sciences. It is an applied ecology in development. Its rise only over 30 years has not formed a perfect theory and method system. Therefore, in order to strengthen the urban ecology research, it is necessary to know dimension of urban ecology research objects and research contents, urban ecology research method and the dimension of college students' learning, urban ecology research results and the urban ecological environment protection consciousness training dimension, urban ecology research level and college students' creative dimension.

Key words: ecology, urban ecology, research, dimensions

Introduction

Needless to say, with advancing urbanization, city has brought a series of serious ecological environment problems, such as urban air pollution, noise, water, waste, reduce biological resources, urban ecological environment quality decrease, serious threat to urban residents living conditions and living space, and received extensive attention of governments and ecologists. Urban ecology, which studies urban structure, function and dynamic coordination in ecological theory and methods, is a branch of urban science and ecology. Urban ecology in natural science and social science combining site, is the development of applied ecology, the rise of just over 30 years, has not formed the academia as perfect theory and method system. Therefore, in order to strengthen the urban ecology research, it is necessary to know dimension of urban ecology research objects and research contents, urban ecology research method and the dimension of college students' learning, urban ecology research results and the urban ecological environment protection consciousness training dimension, urban ecology research level and college students' creative dimension.

1. Urban ecology research object and research content dimension

With the development of urban ecology, its research objects have been gradually defined as a city with dense human activities. Ecological scholars using the ecology theory and method, the city as an ecosystem, the urban structure and functions, the purpose is to seek to improve urban ecological environment and sustainable development of urban economy and urban residents life quality improvement countermeasures, its

research is becoming more and more applied in urban planning, management and construction. The function of urban ecosystem, mainly for urban ecological system of the production, life and reduction regeneration function, they are both phase difference and associated entity, and the function and its structure has certain corresponding relationship, for example, provides a certain quality of urban ecological environment, ecological environment have to all sorts of waste metabolism ability accordingly. Due to this kind of correspondence, continuous population flow, logistics, can flow, flows, information flow to sustain urban ecosystem function, through the center of urban residents, the city's resources and environment, production and life, time and space, structure and function closely together, as always in the contradiction movement of urban ecological system.^[1] These are the concretization of urban ecological research objects.

So what are the studies of urban ecology? In a nutshell, it is the composition and structure of urban ecosystem. It is generally believed that the urban ecosystem consists of three sub-systems of society, economy and nature. Composition and structure of the urban ecosystem research, mainly to explore the city's social, economic and natural ecological system, especially the research population centered city soil, climate, biology, industry, business and other elements and their mutual relations. The social ecological subsystem, consisting of basic population, dependents, service population and floating population, provides labor resources and intellectual support for the virtuous circle of the economic system. Economic ecology subsystem, including agriculture, industry, science, education, information, transportation, finance, trade, architecture and other closely related subsystems, and its core is various resources. Natural

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ecological subsystems, including natural environments, microorganisms, plants, animals and artificial facilities, are mainly based on biological structures and physical structures. The three sub-systems of urban ecology complement each other, interweave, interact and influence each other. We will promote in-depth development of urban ecosystems.^[1]

The research object of urban ecology and the dimension of research content can make the research task of urban ecology more explicit. From 20 age 60 s, the world economy from recovery to rapid development, promote the urbanization process accelerating, also inevitably appear serious urban ecological environmental problems, such as dense, housing, traffic, water shortages, environmental pollution, and so on. Facing the city ecological environment problem is increasingly serious situation, ecologists, economists, sociologists, widespread concerns about the future of urbanization, industrialization in the world, such as, a variety of solutions are put forward. The study shows that as the urban population surges, urban residents' activities are highly correlated with urban ecological environment problems, such as the increasing contradictions between water bodies, atmosphere and land pollution.^[2] the author believes that urban ecological environmental governance is not a pure environment problem, should take comprehensive measures to put problems in the urban ecological system involved in the biogeochemical cycle and ecological control, strengthen urban self-adjustment function, can fundamentally solve the problem of urban ecological environment, finally realizes the urban ecological environment optimization, the urban economy sustainable development and the value goal of improving urban residents life quality. Urban ecology research is to provide the theoretical basis for the comprehensive measures, to explore how to deal with urban development, the relationship between economic development and environmental protection, seeking the correct path of urban sustainable development. Strengthening urban ecological research will help to understand, analyze and solve urban ecological environment problems so as to maintain the balance of urban vitality and urban ecosystem. In conclusion, urban ecological research object and the content dimension of research can make urban ecological research more concrete.

2. Urban ecological research methods and the learning dimension of college students

Urban ecology is a compulsory course in landscape architecture, which plays an important role in the curriculum system. On the one hand, urban ecology is the basic curriculum of botany, soil science and meteorology. On the other hand, urban ecology is a compulsory course for garden plants and ornamental gardening, garden planning and design. In order to adapt to the curriculum teaching, it is necessary to strengthen the urban ecology research, the research methods and the evaluation system and so on will begin to explore urban ecology research

mode, the research is applied to the course teaching, stimulate students learning initiative and enthusiasm, cultivate comprehensive quality, ensure the quality of talent. The correct research method is the important premise for students to change from passive learning to active learning and autonomous learning. The proper urban ecological research method can combine the research of university teachers with the study of university students. The teacher plays a leading role and the students are in the main position.^[3]

With the rapid development of information technology, it is inevitable to use the multimedia network technology to improve the research methods of urban ecology. The multimedia network technology changes the traditional knowledge storage, dissemination and extraction method, which has the characteristics of expressiveness, strong interactivity, good sharing, and organization form, which is more conducive to the assimilation of knowledge. In the face of rapid development of urban ecology, new knowledge is emerging, and multimedia network technology can extend urban ecology research in space and time. On the one hand, using the multimedia network technology, using a large number of pictures and video to make urban ecological research content more intuitive; On the other hand, teachers use the Internet to obtain abundant information in the field of urban ecology research, for example, refer to the ecological world, ecological China site, the higher school teaching resources website, China journal full-text database, dynamic timely understanding of the urban ecology research. Because of multimedia network technology has many advantages in processing information, such as universality, integrity, efficiency, and vitality, which is widely used in the process of urban ecology research, has achieved remarkable results, especially can help college students intuitively understand the structure and function of urban ecological system, to promote college students better learning urban ecology, the research into the study.^[4]

In an important position in the ecology of urban ecology, its research content is a mutual undertaking, gradual transition of knowledge system, used in the process of research on the case study method is more suitable. Case study method, refers to the university teachers in the process of urban ecology research, to discuss the specific knowledge of the important study way of the typical cases, has the characteristics of leading, inspiring, participation, vividness. The adoption of case study method in urban ecology has produced two major transformations: one is the transformation of single research into multi-form interactive research; the second is to change from the research of injection knowledge to specific knowledge. For example, in the urban population study of "urban ecological system", the "relationship between urban population size and structure and urban development" can be adopted. The case for paid close attention to by people of social hot issues, for example, in the future urban

population aging problem, problem of migrant workers, the problem of house price is too high, education, health, employment, and so on, in the process of research problem oriented, university teachers “how to know these phenomenon” “what is the effect to the urban development” “how to solve practical problems, such as” urging students to read newspaper, watch TV, Internet, etc., to collect data, form their own point of view, and then orderly discussion in class, to get some answers in class. The success or failure of the case study method depends on the study cases must meet the following requirements: the research objectives are clear; To reflect the research trends of urban ecology; The issues raised are appropriate and research significance; Fit the actual situation of students' learning. In the process of research, university teachers should design problems in a simple way, such as cities, urbanization and other concepts. Knowledge of profound, complex, university teachers design problem, be distinguished, step by step, to encourage college students to solve problems in the process of logical reasoning, for example, what is the ultimate cause of urbanization? How to promote urbanization? What effect does urbanization have on college students' employment? By doing so, it is helpful to stimulate the interest of college students.^[5] In a word, urban ecology uses case study method has many advantages, has an irreplaceable role, help students consolidate and deepen the urban ecology knowledge, their ability to learn and able to ability to solve practical problems.^[5]

The research methods of urban ecology and the learning dimension of college students also require interactive and discussion methods. The research of urban ecology must be practical and easy to understand. By the method of interactive and discussion-based, when it comes to has studied the related content, may be appropriately arranged some problems, for students after class to access to relevant data, and then discuss in class, the teacher should be targeted.^[6] is important to emphasize that in the process of urban ecology research, only by the method of interactive and discussion-based, can fully mobilize students' learning enthusiasm and initiative, improve research level of university teachers. Because of the advantages of interactive and discussion research methods, the study of college students is truly integrated with the research of university teachers to form an organic research community. This is one of the specific manifestations of “urban ecological research methods and college students' learning dimensions”.

The research methods of urban ecology and the learning dimension of college students need to strengthen the combination of theory and practice and create favorable conditions for improving the quality of urban ecological talents. Urban ecology is a basic discipline, which is more applied and practical. Therefore, it is necessary to combine theory with practice. In the process of urban ecology, combining the theory and practice, can adopt the mode of experiment, practice, visit,

etc, to improve the way of thinking, and increase the perceptual knowledge, also can promote college students' study and work in the future to accumulate important social knowledge and provide some useful practical experience. In the experiment “urban climate factor determination”, through the combination of theory and practice, in the experiment demonstration and the operation of the instrument, the university student's practical ability is continuously promoted. In terms of urban ecological environment protection problems, the need for targeted research work, or to the environmental protection department field ecological environment protection technology processes, or go to the city construction department field feelings of urban greening regulations on the work. Urban ecology research to combine theory with practice, encouraged college students to have to grasp the method of the urban ecology principle and the concrete application to production and life of the city, help change the phenomenon of “high score low-energy” in the part of students, to develop urban ecology talents to better meet the needs of the urban ecological environment protection.^[7]

The research methods of urban ecology and the learning dimension of university students are required to reform the evaluation system, so as to effectively promote the improvement of college students' comprehensive quality. In order to adapt to the curriculum system, research content, research methods and reform of research methods, a good research evaluation system must be established. Because the establishment of an excellent research evaluation system is an inherent requirement of urban ecological research, it is also the main means to study the information feedback and research level evaluation. The excellent research evaluation system is to weaken the repetitive study, strengthen the innovative research, and ask the research evaluation system to run through the whole process of urban ecology research. In the process of evaluation, the research content is widely covered, which can fully demonstrate the research level of urban ecology and the study effect of college students. In the research evaluation system, the basic indicators such as attitude, knowledge, ability and personality can be used. In the study of urban ecology, the research level of urban ecology can be reflected through the interaction of attitude, knowledge and ability. Only by using this kind of research evaluation method can we objectively and comprehensively evaluate the study effect of college students and the research level of university teachers. Is caused by the concept of city ecology transformation, the research methods of reform, correspondingly, enrich and perfect the study content need a new evaluation system, which requires flexible study methods, study methods and research ideas to keep pace with The Times. Only study evaluation system of the practical work, can promote the university students in urban ecology study consciously grasp the basic knowledge and basic theory, thus greatly improve the detection, analysis, and the ability to solve the problem of urban

ecological environment.^[8]

3. Urban ecological research results and the cultivation dimension of ecological environment protection consciousness of university students

Building a socialist ecological civilization is related to the well-being of the people and the future of the nation. Face a tighter resource constraints, the serious situation of serious environmental pollution, ecological degradation, must set up respecting nature, comply with the nature, protect the natural ecological civilization concept, put the construction of ecological civilization in prominence, into the Chinese characteristic socialist economic construction, political construction, cultural construction, social construction and the whole process, the construction of beautiful China, realize the sustainable development of the Chinese nation.

It is common for urban ecology specialized courses to be opened in all kinds of agricultural colleges, and it is not uncommon for public elective courses to be offered to universities. Starting from the course positioning, teaching design, teaching quality and assessment method, we discuss the teaching of urban ecology of public elective courses. Public elective courses set up object is liberal arts, science and technology and the arts undergraduates, such as opening the purpose is to improve the personnel training goals, meet different hobbies, the expanded aspect of knowledge, optimize the structure of knowledge, promote scientific literacy, cultivate college students' urban ecological environmental protection consciousness. The teaching content of public elective courses should not be too professional, so it must attract students with the interest of knowledge, guide them to play their subjective initiative and carry out autonomous learning in the real sense. Urban ecology, of course, as a public elective courses, professional direction more due to the teaching object, background difference is big, course to understand different levels, different students' course selection purpose, really had greater difficulty to teaching design. Therefore, the research results of urban ecology must be close to the actual life of college students, so as to make it more interesting and practical. If urban ecology research or professional theory is too strong, can increase students' learning difficulty, hard to mobilize enthusiasm for learning, for college students of urban ecological environment protection consciousness training. The urban ecology research results into college students systematically accept urban ecology popularization education, constantly arouse their interest in learning, encourage students to urban ecology research achievements to realize the city ecological environment problems, and their scientific literacy is gradually enhanced, city to further strengthen the construction of ecological civilization concept, eventually make the urban ecological environment protection consciousness is to cultivate

the college students.^[9]

Through the research results of urban ecology, we can guide college students to understand the development history of urban ecology, and help to improve the consciousness of urban ecological environment protection. In the history of our country, the people who first put forward the idea of urban ecological thought were Shang Yang, and then the idea of rational distribution of population by Xunzi and other people. In general, the Chinese ancient urban ecological thought mainly reflect people and to the relationship between people and objects, and the west early urban ecological thought form Paris is the main symbol of the redevelopment of the concept and the planning theory of garden city. The beginning of the 20th century, based on the theory of biocenology principle of Chicago school is formed, thus the theory school systematically study of urban ecological environment problems, officially marks the city ecology. In the late 1960s, the United Nations educational, scientific and cultural organization "man and biosphere" plan, the publication of the journal of urban ecology, formally as the city ecological system, so as to get continuous development of urban ecology research. Since then, the academic conferences on urban ecology have been held frequently around the world, and many academic papers have been published on urban ecological environment problems, and urban ecological research has entered a new stage. Urban ecology in China starts late, the ecological society of China in Shanghai in December 1984 held a "national urban ecological science research institute" for the first meeting, "urban ecology professional committee of China ecological society" was formally established in the meeting, marks the beginning of urban ecology research in our country, then enter the classroom teaching in many colleges and universities. Through the transformation of urban ecological research results, the university teachers have tried to bring the concept of urbanization into the classroom, which is relevant to college students. They are both fresh and curious, and soon integrate into the classroom. University teachers' reference, for example, the European case urbanization, focus on the urban ecology historical perspective, from college students interested in its settlement of lecture interesting theory knowledge, into the natural ecological culture, college students in imperceptible in urban ecology development clearly. The transformation of urban ecology research achievements in the classroom to the university, let students realize the urban ecology is becoming more and more deep into the city's production and life, especially for urban ecological environment to the survival of city residents have the effect of beautification, protection and improvement of. University teachers from the urban ecology research results into a college classroom, elaborated the concept of urban ecology of famous scholars Mackenzie, research content and the actual application, guide students to understand the urban ecology major contribution to human society and understand the

ecological civilization along with the development of human history development, understand the meaning of the harmonious development of man and nature, strengthen the consciousness of protection of urban ecological environment of the host, in the later life and learning consciously apply the dialectical view to tackle the problem of urban ecological environment for the maintenance of urban ecological environment benign circulation and render contributions to promoting ecological civilization construction.^[10]

For a period of time, our country has been the first pollution, the post-treatment, the ecological environment has been destroyed, affecting the residents' physical and mental health. In fact, every country has a similar problem in the early stages of economic development. The advanced management experience in London is of great significance for China's urban pollution control. London used to be very polluted city, through the unremitting governance, London now the sky is very blue, the trees species of Trinidad and Tobago and forms, the street is full of green, on both sides of the street is a green wall, became a famous green city. Actually, green city London experience is to use the forces of nature, let the wild plants with the natural growth, never use against heterozygous wild lawn pesticides, city residents can freely on the green, the trees, activities. The advantage of London's experience, obviously, is that it costs less and works well. However, most of China's urban greening is mostly planted with artificial selection of trees and artificial laying of grass. Because of this, the urban greening of our country must be watered and fertilized, resulting in the waste of scarce urban fresh water resources. Secondly, it is necessary to prevent and treat diseases and pests, and the result of spraying fertilizer on the urban environment. In these cases, university teachers can show the results of urban ecology research, and show them in class through pictures and video, which can help to cultivate the awareness of urban ecological environment protection in college students.

Accelerated the process of urbanization in our country and promoting the ecological environment protection under the new situation, the urban ecology urban ecology research results into the college course teaching, improving college students' ecological environment protection consciousness, strengthen the protection of urban ecological environment of college students' sense of urgency and historical sense of responsibility. Urbanization is one of development trend of the 21st century, China's urbanization is expected over the next 20 years to orgasm, but face a serious trend of urban ecological environment destruction, therefore must cause enough attention. The research of urban ecology should be closely combined with urban reality, and the research methods and research methods should be reformed in the direction of urban ecological environment. While improving the research level of urban ecology, it pays attention to cultivating and improving the consciousness of

urban ecological environment protection. The university teachers should timely pass on the issue of eco-environmental hotspots to college students, and guide them to understand the seriousness of the problems of urban ecological environment and the urgency of solving urban ecological and environmental problems. Research, for example, "air pollution in city", must through the news pictures, video introduction of smog problem, research clearly the damage cause of haze, and protective measures of haze, such instance can make college students learn more knowledge of urban ecological environment protection. Again like, study of "water pollution", should be introduced as a result of industrial and mining enterprises wastewater discharge of cancer villages events directly, for college students access to information, understand the ins and outs, highly know the seriousness of the urban ecological environment protection problems, cultivate university city ecological environment protection consciousness, strengthen the propaganda of urban ecological environmental protection responsibility, take concrete actions to reduce or even eliminate such events. There are many similar instance, university teachers adopt these vivid ecological case, let students to victims face problems, concerned about urban ecological environment problems in real life, urging them to positive action to improve the urban ecological environment, strengthen the protection of urban ecological environment of historical sense of responsibility.^[11]

4. The level of urban ecology research and the creativity of university students

The aim of the reform of urban ecological research method is to improve the research level, while the main goal of improving the level of research is to improve the creativity of college students. In order to improve college students' creativity, used in the study of urban ecology Austin in 1963 put forward the method to the cultivation of college students' creativity, suspended in the collective problem solving class, students are encouraged to speak enthusiastically, lead to a variety of solutions. Invited well-known scholars and experts to develop ecology project, causes the student to understand the latest research progress of city ecology and the current status of ecological city construction, such as research and practice of the construction of the urban forest at home and abroad. Aiming at the research content and characteristics of urban students, this paper sets up the idea of cultivating innovative talents, and explores the ways to improve students' creativity. The research of urban ecology must transform traditional research concepts, stimulate innovative thinking ability, improve research level and cultivate innovative talents. Urban ecology is the study of urban ecological regulation by ecological theory and method. Theoretically, it explores its structure and function relation, and applies it to improve urban ecological system. With the rapid growth of urban population, pollution of land resources and

shortage of water resources, the relationship between urbanization and urban ecological environment becomes an urgent problem. Pedagogy points out that knowledge is the interactive process of human individual and living environment. Therefore, in the process of urban ecology research, must mobilize all positive factors to avoid injection research model, to carry out the free discussion of active participatory research, focus on cultivating innovative thinking, and improve the ability of problem analysis as soon as possible. Li Zhengdao, a Chinese-American physicist, said: "the most important thing to cultivate talents is to cultivate creativity". Innovation in science and technology must be based on human creativity, innovation and innovation. Urban ecology research from the perspective of innovative talents cultivating goal, the university teachers' teaching based on research service, careful guidance for college students, analyzed the formation of city development and the status of the different rating scale of urban construction, expand the research content and subject development direction, cleverly set up problems, stimulate students' innovative thinking, pay attention to cultivate their ability to analyze and solve the problem of urban ecological environment.^[12]

The research level of urban ecology and the creativity of college students raise the dimension and demand the improvement of college students' practical ability. Internship is not only an important measure of urban ecological research, but also a major part of urban ecology curriculum teaching. Because urban ecology is applied and practiced. However, in the traditional research mode, the college students have a large number of students who lack the ability to analyze and solve urban ecological environment problems after graduation. Only by increasing the content of the internship and providing more social practice activities, college students can use ecological theory and method in practice to solve the problem of urban ecological environment. Except by means of multimedia network technology research, university teachers should pay attention to the diversification of research way, take the undergraduate lecture, experiment, research and other forms, the research content, research under the guidance of teachers own design scheme, improve the urban ecology research level of university students, so as to cultivate college students' creativity.

The research level of urban ecology and the creativity of college students improve the dimension and promote the participation of college students in the extracurricular science and technology innovation activities. College students' extracurricular scientific and technological innovation activities, which generally refers to university students under the guidance of university leaders and university teachers, use their spare time to independently carry out academic activities of science and technology. The nature of scientific and technological innovation activities of college students is the innovation practice activity, which is the component part of the education of the quality of

universities, and also an important way to improve the knowledge level of college students. With the reform of China's economy, science and technology and social progress and higher education, colleges and universities have attached great importance to college students' scientific and technological innovation activities. Theoretical courses for ecology is strong, but the lack and other characteristics, in order to improve college students' basic experiment skills, can through the science and technology innovation activities, let students participate in urban ecology related experimental projects, improve the quality of the basic experimental operations. Under the guidance of university teachers, college students participate in the application, design, instrument operation and experimental data analysis of experimental projects, and conduct basic experimental skills training. For example, college students participate in the extracurricular science and technology innovation project of the research on the anti-heavy metal mechanism of urban greening plants, and the exploration of scientific enthusiasm can be reflected. Practice shows that combining with the characteristics of urban ecology study and students' extracurricular science and technology innovation activities, the expanded aspect of knowledge unceasingly, establish rational knowledge structure, stimulate their creativity in a larger extent; Scientific research activities meet the high level of psychological needs of college students, and strengthen the confidence and will to break through and to break through.^[13]

University teachers are teaching organizers and practitioners, whose scientific research level determines the quality of teaching, so it is very important to strengthen the cultivation of teachers in urban ecology. The young teachers will attend short-term training, attend short-term training, observe the excellent teachers' research and teaching, and improve the research and teaching level of urban ecology. They are encouraged to participate in urban ecological research and improve the quality of urban ecology teaching. University teachers should actively apply for urban ecology research projects and carry out scientific research, teaching research, applied research on urban ecology teaching, realize the urban ecology harmonious interaction of teaching and scientific research. Practice has proved that higher research level of university teachers can improve the level of teaching, teaching and research on the higher level of scientific research, is conducive to overall improve the level of their teaching and scientific research. More importantly, an urban ecology research team must be established. A good urban ecology research team has the advantages of reasonable education and age, high overall quality, rich research experience and remarkable research results. To strengthen the construction of urban ecology research group at the same time, efforts to build up the urban ecology exquisite course, perfecting the course system, to promote the research content, research method and the talent training mode reform,

improve the quality of talent cultivation, is of great significance. In the process of urban ecological research, teachers must form a good habit of writing scientific research diaries and reflecting on scientific research. Reflection, the so-called scientific research is refers to the university teachers with their own urban ecological research process as the object of thinking, to make some scientific research behavior, and an analysis of the results generated by activities. Through the reflection of scientific research, it is helpful to improve the self-awareness level of university teachers, to promote the monitoring of urban ecological research process, and to improve the scientific research quality of university teachers. There are no fixed formats and requirements for the journal of scientific research, which can be recorded in the way they like and what they are interested in. Common scientific research diary forms include: comments, outline, special style and essay. The contents of the journal of scientific research include: the study of feeling or harvest, the success or lack of research, the blip of research, and the innovation of research. Only in this way can we improve the research level of urban ecology and finally improve the creativity of college students.^[10]

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Low-carbon Leisure Life- the Perfect Trip of Habitat Environment Construction

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Abstract: With the rapid development of social productivity and the accumulation of wealth, the opportunities and potentials of leisure activities have been risen sharply. However, during the period of high-speed industrial society, people do not feel relaxed but depressed, causing the leisure alienation, which does harm to nature, society and human beings. Low-carbon leisure, as a lifestyle advocated by contemporary people, is a way to solve the current ecological problems, which can achieve relaxation, entertainment, individual development and nature returning simultaneously.

Key words: Low-carbon Leisure, Happiness, Harmonious Symbiosis

Introduction

Being an important space for human survival and development, leisure is also the life of human natural truth. Throughout a person's life, Leisure activities are both a part of living and life. Leisure has been considered as an important activity since the ancient times. In Ancient Greece, leisure, attracting much attention, is the ideal life and spiritual home that people are dying for. Aristotle pointed out clearly that happiness exists in leisure. With the development of society, leisure evolves constantly. From a global perspective, all countries of the world experienced or are undergoing a revolution of leisure. In general, when per capita GDP increased to 1,000 US dollars, people will pay much attention to leisure needs. Currently, leisure development in China is facing unprecedented challenges and opportunities, due to these reasons such as the acceleration of industrialization, population growth, increasing urbanization and environmental destruction.

1. Lost: contemporary leisure dilemma

At present, China is in the decisive stage of building a moderately prosperous society in all respects. In coastal areas, people have entered a rich or comparative affluent level. With the increase of the statutory holiday, people spend about one-third time in leisure. Therefore, leisure holds a growing important status in contemporary life. From the perspective of leisure taste, leisure is divided into "elegant", "vulgar", "rude and vulgar", and "low and vulgar". It has become a major issue increasingly for people to pursue the quality of life and value on how to make leisure life more meaningful and valuable, how to make life more splendid. With the application of modern science

and technology and a large number of machines, as well as, the rapid development of social productivity and the sharp increase of wealth, it enhances the potentiality and opportunities sharply that people participate in the leisure life. However, during the high-speed development period of industrial society, the growth of material wealth does not make people feel relaxed but repressed, confused, resulting in the alienation, commercialize and vulgarization of leisure life, which are harmful to human beings, nature and society. In the Industrial society, people generally believe that work can bring wealth, and make a better life for themselves and their families. Thus, getting more benefits and money becomes a symbol of success in life. Since life value was coerced by money, then it becomes appendages of money. Utilitarianism, pragmatism, money worship, egoism became credos of life, the leisure suffered serious alienation, which then leads to the relationship alienation between man and nature, man and society, and man and itself. "Work hard; enjoy fully," has become a dominant social value. The leisure, guided by "desire", possesses the leisure shell only, not the real leisure. As a means of consumption, leisure is just a flag and guise, and subjects to consumption needs. Actually, consumption is the center surrounded by all. However, nobody is content to material, it is doomed to chase consumption endlessly, which joins people's all the wisdom and strength together in plundering and extracting natural resources. In the case, it will result in the violence to the nature endlessly, and the destruction to nature. Since they only enjoy the present fully, people would pursue material satisfactions fanatically and eagerly. Time is cyclic in previous period, while is linear now. As a result, psychological time of people has gone forever. Loss of original serenity, calmness and elegance of leisure life is caused by scarce time, resulting in a sense of hurry and crisis in life, so that people lose

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their taste and feelings for life, leading to various problems, especially for the rise of human's psychological pressure. Like a gamble, life is full of mania, people pursue the maximization of power and wealth, and social mechanisms are the tools to achieve personal ambition and achievements. In some degree, being slaves of material goods and time, people achieve their social status by utilizing leisure time. That betrays the essence of leisure, because the real leisure is to be self-improvement and promote social civilization.

2. low-carbon leisure life- the Perfect Trip of Habitat Environment Construction

Essentially, leisure is a kind of experiential activity that people are engaged in pleasuring their mind and body and developing themselves in leisure time. It is also a process to get rid of the shackles, develop their potentiality, and be a "real man". Leisure is not only a state of life, but also a way of life. As a dynamic process of human development, leisure is about both individual and society. At present, under the situation of deteriorated natural environment, tense interpersonal relationship, exhausted physical and psychological situation, it is necessary to choose low-carbon leisure that returns to nature. Covering both the connotation of low-carbon life and abundant content of leisure life, low-carbon leisure life is related to physical and mental health of human beings, and their quality of life. Besides, it relates to human's happiness and harmony, and their lives. Under the guidance of low-carbon leisure values, people can achieve relaxation, entertainment, individual development and nature returning simultaneously.

2.1 leisure life and low-carbon life are consistent in humanity presets: High correspondence

Leisure has some obvious characteristics such as humanity, sociality, and creativity. In the process of leisure, it makes the leisure subject do an experience in the aesthetic, moral, creative and exceeding aspects in his spirit of freedom. In terms of its nature, leisure does not mean a large-scale consumption. Leisure activity is not to obtain material wealth in the subjective, or to cost a large amount of material resources in the objective, which coincides with the low-carbon life. To some degree, leisure can achieve its own harmony, and enrich integrity and comprehensiveness of humanity. Besides, leisure strives to protect the ecological environment and build a beautiful home. Firstly, low-carbon life is to re-implement the harmonious relationship between man and nature, and to implement a virtuous circle life-style about "Man-Carbon-Nature". Secondly, low-carbon life is to concern about the overall value between man and nature. Furthermore, it reflects on behavior of high-carbon emissions in life consciously, saves energy and reduces emission, promotes harmonious coexistence between man and nature from the people's lives and livelihoods perspective.

2.2 leisure life and low-carbon life are consistent in target: Living a happy life

Leisure life is closely linked with people's happiness. Human can create, taste and feel happiness in leisure. Leisure life pursues happiness, and the subjective experience of happiness must be demonstrated by leisure and enjoyment. Although labor can show the happiness, while, a happy life depends on leisure largely. In the one-sided view of happiness, material pursuit is expanded abnormally; nature has become a site of extracting wealth and discharging of waste. As it were, when pursuing the pseudo happiness, we not only forget the nature, but hurt the nature deeply; we not only damage the material nature causing ecological environment problems, but also breach the real life. In the pursuit of pseudo happiness, leisure time has gone, nature has gone, sub-health appears, pressure increases, mental anxiety appears, thus, mental illness strikes. Ironically, before our pursuit of materialistic happiness, the "beautiful, natural, original" natural thing is existed, while is scarce now, it needs to gain from a double efforts. At present, standard of living has improved, but less happiness. One of the reasons is that people are not kind to nature, consume and alienate nature. As an important source of happiness, natural things and simple life is also an indicator of happiness index. Happiness can not be far away from nature, and not be lack of virtue. Low-carbon life is not only a lifestyle of low-energy, low-consumption, low-spending, but a kind of environmental friendly, neat, simple, fashionable life. It returns to an authentic creative simple life by abandoning unnecessary complexity, throwing away the tediousness and cumber, abandoning excessive luxury, abstaining from "convenient hobby", and not pursuing "face consumption". All roads lead to Rome, as low-carbon life and leisure life. They are existed in improving the quality of life constantly, making life more meaningful and more valuable, and making people live a happy and sweet life.

2.3 leisure life and low-carbon life are consistent in mood: Dwelling poetically

Pursuing a more harmonious and beautiful future is the eternal dream and theme of mankind. The leisure, in the thought of Chinese traditional leisure, it emphasizes the overall harmony of life among Confucianism, Taoism and Buddhism, and emphasizes the principle of "integration of nature and man." The activities that people make a living and devote themselves to society is leisure, so do the self-realization and life experience. Harmonious coexistence between man and nature is a kind of beauty. It is blend with the "existence of destiny", mainly for the coexistence of "Man-nature-society", which means that human is entering brilliant civilization from barbarism. This is an expectation of goodness that human, dwelling in the earth poetically can complement and co-exist with nature. Dwelling poetically makes people feel boundless pleasure of life, and obtain the peace in spirit, as well as broad-minded and optimistic

life. The condition of poetic life is that there is not only poetic garden for human habitation, but also individual mind. A personal mood in life depends on the extent of the individual spiritual realm and moral cultivation. There are four realms in life, for example, the "desire realm", "realistic realm," "moral realm" and "aesthetic realm". It is the desire realm that refers to the least desire for personal living, which is the lowest realm; realistic realm is the "living architecture" of "the relationship of subject - object "; the moral realm regards the comprehension to the integration of creature's relations as the highest goal of spiritual pursuit; while the aesthetic realm belongs to "living structure" of "high-level integration of subject-object". The people, dwelling poetically, generally achieve the state of "moral realm" and "aesthetic realm", in which people are with the world. "Low-carbon leisure" is a kind of leisure concept and lifestyle that does not impose personal willing on nature. It is the consciousness transformation of dwelling, the appreciative attitude to nature and the perfect feeling to environment that make people rediscover the significance of natural environment, advocate the way of "doing nothing" and "listening", and respect the heterogeneity of nature. Low-carbon leisure emphasized that man and nature should live with each other harmoniously, the subject don't regard the nature as an object of plunder and consumption any more, but appreciate, enjoy, imagine as well as create it. On the one hand, nature enters into our inner world, and our soul is traveling in the boundless nature, thus, man and nature achieves a integration in the metaphysical level; on the other hand, as a practice, leisure realizes the harmony between the subject and object. Once there is an integration of man and nature, the life would be true, good and beautiful.

2.4 Leisure life and low-carbon life are consistent in mission: Promoting the comprehensive development of man

Labor is the premise and foundation of leisure, leisure is the purpose and destination of labor. "People not only are qualified for the work, but also are able to enjoy leisure time. Once again, we must emphasize that leisure is the unique original nature of life. As the purpose of labor, if necessary, leisure is preferable to labor. Thus, we must know what people do in their leisure time." Leisure life is the effective path to a personal comprehensive development. It makes people not only obtain the condition and opportunity for personal development, but gain real development in this process. An important prerequisite for human comprehensive development is that the free leisure time increases, and the degree of that depends on the free degree of leisure activities. Marx recognized fully that what the role of leisure time is to human comprehensive development. "Actually,

time is a positive existence of people, and it is not only the scale of human life, but also a space for human development". "Free time is that you can govern time freely, which is not absorbed by labor directly, but for rest and entertainment, and then opening up a vast world for free movement." It can be said that leisure is a prerequisite for development. One can not develop himself, if he can not enjoy or absorb positive achievements and human civilization in leisure. In the process of leisure, people can develop their own comprehensiveness, maximize own potential, show own unique personality, and express own freedom largely. It is an important condition and guarantee for human comprehensive development to cultivate and improve the low-carbon leisure quality. By reducing carbon emissions, and not destroying ecological balance, leisure subject cultivates effectively human ecological attainments, improves comprehensively human ability, enhances the consciousness of ecology, and promotes harmonious coexistence in human and nature, human and society, which will achieve sustainable development of human. Based on low-carbon life concept of ecological civilization, ecological conscience jumps out the subjective philosophy of subject-object dichotomous framework. It develops "symbiosis" philosophy in the integration of man and nature: from the meaning of ultimate value, it sticks to the position that human is the highest value in ecosystems; in a way of achieving ultimate value, it sticks to the view that nature is the fundamental of ecological value and human value.

In a word, when people are wandering in harmonious living environment leisurely, human will not feel lonely, the world will not become desolate, nature do not be cruel. Only adhering to the life attitude of "people have a rest leaning on trees", can we achieve the sustainable development of economic and production activities in taking human interests and values into account, and maintaining natural interests and values simultaneously.

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Does Distance and Personal Circumstances of Trip Makers Matter to Mode Choice? Evidence from Urban Ghana

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Abstract: The paper presents empirical results from an August 2014 cross-sectional survey of short distance trip makers who reside in various communities in Kasoa, Teshie, and Madina in the Greater Accra Metropolitan Area of Ghana. Specifically, the paper what urban trip makers in Ghana consider an acceptable distance for choosing active transport modes, together with mode choice determining factors. The primary data were subjected to rigorous statistical and geo-spatial/ proximity analyses in ArcGIS. The analyses show evidence of a high use of active transport modes within a walkable distance of 1000 metre radius between trip origins and trip destinations. Also, trip distance and educational status strongly predicted mode choice, although gender and age were also considered as important variables in mode choice. Policy actors must, therefore, focus attention on encouraging pedestrianisation through the provision of secure and unobstructed walkways.

Key words: Mode choice, active transport, walkable distance, Greater Accra Metropolitan Area, Ghan

Introduction

In densely populated areas of the world where people live near centres of activities, trip makers are known to make greater use of active transport modes such as walking and cycling as opposed to cars (UN-Habitat, 2011; Handy, Cao and Mokhtarian, 2006; Van Wee, 2002; Boarnet and Crane, 2001). Active transport has been associated with positive benefits, particularly for air quality and climate mitigation (Cirilli and Veneri 2014; Cervero, 2013; Naess, 2012; Zegras, 2012). Thus, various studies have highlighted the need to properly coordinate land use and transport planning so as to reduce car dependency, and rather promote active transport modes (Abane, 2011; Zhao, 2010). A proper coordination of land use and transport systems may be exhibited in, for instance, siting basic necessities such as schools, health centers and markets near trip makers. This will reduce trip distances and will greatly minimise the time and efforts expended on active transport.

Within the developing world context, walking, as an active transport, is performed largely by the very poor who are unable to afford motorised modes of transport. These 'captive walkers' (Cervero, 2013) are estimated to constitute a third of all trip makers in Africa, for instance (International Association of Public Transport, 2011). A recent World Bank (2015) study confirmed that Ghana indeed has a lot of trip makers who walk. This notwithstanding, a review of Ghana's National Transport Policy indicates a lack a clear policy policies and strategies to promote a safer environment for users of active transport modes.

This has led some commentators to argue that "in developing transport systems, technologists and economists often give priority to fast transport modes and adopt indicators of expected benefits without taking into account the real system effects on society and urban structures" (Oteng-Ababio and Agyemang, 2015, p.28). Generally, it has been observed that city planners are often ignorant about the distance necessary for the development of infrastructure for active transport, and even if the distance is known, its planning implications (Rahul and Verma, 2014). Such ignorance has the tendency to make city authorities insensitive to changes taking place within the urban milieu (Priemus et al. 2001).

Against this backdrop, the author is of the view that, in a business-as-usual scenario, Ghana may not fully attain the Sustainable Development Goal 11 to create "cities of opportunities for all, with access to...transportation" (UN, 2017). Among other challenges, the lack of clear policy guidelines on active transport may exacerbate the lack of access to opportunities by a majority of urban dwellers who are trapped in a maze of 'transport poverty' (UN-Habitat, 2011) making them poorer and socially excluded. In a recent China-Africa Urban Development Forum, this point was highlighted in a keynote address by the sector minister responsible for the Zongo and Inner City Development. He then threw a challenge to participants in the forum to come up with policy recommendations to promote social inclusion. The policy relevance of this present paper, therefore, is seen in its direct response to the minister's challenge by focusing attention on

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active transport, which albeit used by many poor urban residents, has received less policy attention.

A survey of literature suggests that studies on active transport have engaged the attention of scholars particularly in North America and Europe (see e.g. Millward, Spinney and Scott, 2012; Gilmour, 2007; Pucher and Dijkstra, 2003; Rafferty et al., 2002). In other parts of the world, the literature on active transport is burgeoning (e.g. Rahul and Verma, 2014; Matous, Todo and Mojo, 2013; Azmia, Karim and Amin, 2012; Arasan et al., 1994). In Ghana, however, less attention has been placed on active transport to the extent that almost all studies conducted on mode choice have focused on motorized transport (for e.g. see Agyemang, 2017; Amoh-Gyimah and Aidoo, 2013; Abane, 2011; 1993). This then presents a gap in the existing body of literature which this present paper attempts to fill.

In particular, the paper examines, first, what urban trip makers in Ghana consider an acceptable distance for choosing active transport modes. Following after Rahul and Verma (2014) as well as Arasan et al., (1994), the 'acceptable distance' is defined as the maximum trip length of slow modes after which a person chooses a fast mode of travel. Secondly, mode choice factors for intra-community trips are explored. The paper is organised as follows. Following a general introduction highlighting the policy and theoretical gaps, the next section reviews relevant literature on determinants of choice of active transport. Afterwards, background information about the study area, as well as data and methods adopted, including the sampling framework are discussed.

Then the findings made are presented and discussed in the light of existing studies. The paper finally wraps up with concluding remarks and policy recommendations.

1. Literature Review

Travel distance characteristics associated with active transport appear to vary across cities. For instance, Scheiner (2009) regressed travel mode choice in Germany and found that walking was usually great at distances below one kilometre. Millward, Spinney, and Scott (2013) found that in Halifax, Canada, the 'walkability' of neighbourhoods is within a one-kilometre radius around respondents' homes. In Calgary, Alberta in Canada, Seneviratne (1985) found that most trip makers were likely to walk an average critical distance of 1.1 Km. In the Indian city of Bangalore, Rahul and Verma (2014) found that at an approximately 1.4 km radius, trip makers were most likely to go on foot. Azmia, Karim, and Amin (2012) found that male teenagers and adults in Malaysia, for instance, achieved the highest average walking distance of 407 meters while the lowest average walking distance is female elderly with the distance of 355 meters. Again, in India, Arasan et al. (1994) found that pedestrians were more likely to walk or bike within an average critical trip time of 20 min and 24 min, respectively.

According to Matous, Todo and Mojo (2013) travel activities and social networks of respondents in the Tiyo District of Ethiopia are geographically bound to about 15 minutes walkable distance within their immediate neighbourhoods. These varying and inconsistent findings have led Rahul and Verma (2014, p.112) to caution against the universalisation of the acceptable walking distance, arguing that "the acceptable distance for walking and cycling found for one city cannot be applied directly to any other city".

In addition to geographical factors, there are a number of demographic and socio-economic determinants of mode choice with respect to active transport. These socio-economic and demographic factors include age, gender, education, occupation and income levels of trip makers. While Azmia and Amin (2012) reported regular walking among teenagers/ adults due to their physical ability and stamina, compared with older trip makers in Malaysia, Schwanen et al., (2004) older people in the Netherlands actually walk quite often. With regards to gender roles, studies (van Acker et al., 2007; Schwanen et al., 2004; Simma and Axhausen, 2000) have found that women generally walked and biked more often than men. In the US, a study found highly educated and high-income trip makers regularly walk to nearby neighborhood station (Loutzenheiser, 1997). However, while this may be true in some Western societies, such as the Netherlands and Austria where Schwanen et al., (2004) and Simma and Axhausen (2000) conducted their studies, their conclusions may not be valid for other societies. Given safety and cultural concerns, women are less likely to bike in certain societies where dedicated infrastructure for biking is either unavailable or is culturally unacceptable for them to do so. for instance, found that when safer environment is assured, including more street lighting and land use mix, the threat of violent attacks is minimised, thus encouraging more women and even the elderly to engage in active transport (Meleis, 2011; Li, 2003). Wang, Akar, and Guldmann (2015) report that personal perceptions including safety, commute costs and environmental consciousness greatly explained the choice of respondents who bike consistently.

The body of literature has demonstrated the role of geographical and non-geographical factors which influence active transport. The gap that remains to be filled is the extent to which these factors are relevant from a sub-Saharan African country context in view of the differences in spatial, cultural and environmental issues observed.

2. Methodology

This paper is based on primary data generated in August 2014 through a cross-sectional survey of short distance trip makers who reside in various communities in Kasoa, Teshie, and Madina (Figure 1). Kasoa (Longitude 5.5337202 N, Latitude 0.4729278 W), is a sub-urban settlement found in the Awutu

Senya East municipality of the Central region of Ghana. Kasoa is home to an estimated 69,384 inhabitants (GSS, 2012). The Kasoa Old Market is an important commercial centre where a majority of inhabitants here visit regularly. The Madina township (longitude 5.6728928, Latitude 0.1824012) is the headquarters of the La Nkwantanang Madina Municipality and home to 111,926 inhabitants (GSS, 2012). A major commercial

centre in this town is the Madina Market, where a majority of residents visit. The Teshie township (Longitude 5°35'N, Latitude 0°06'W) is a major town in the ledzokuku Krowor Municipality. Together with Nungua, this municipality is made up of 227,932 inhabitants (GSS, 2012). A majority of these residents frequent a major local market called the Lascala Market to shop on a regular basis.

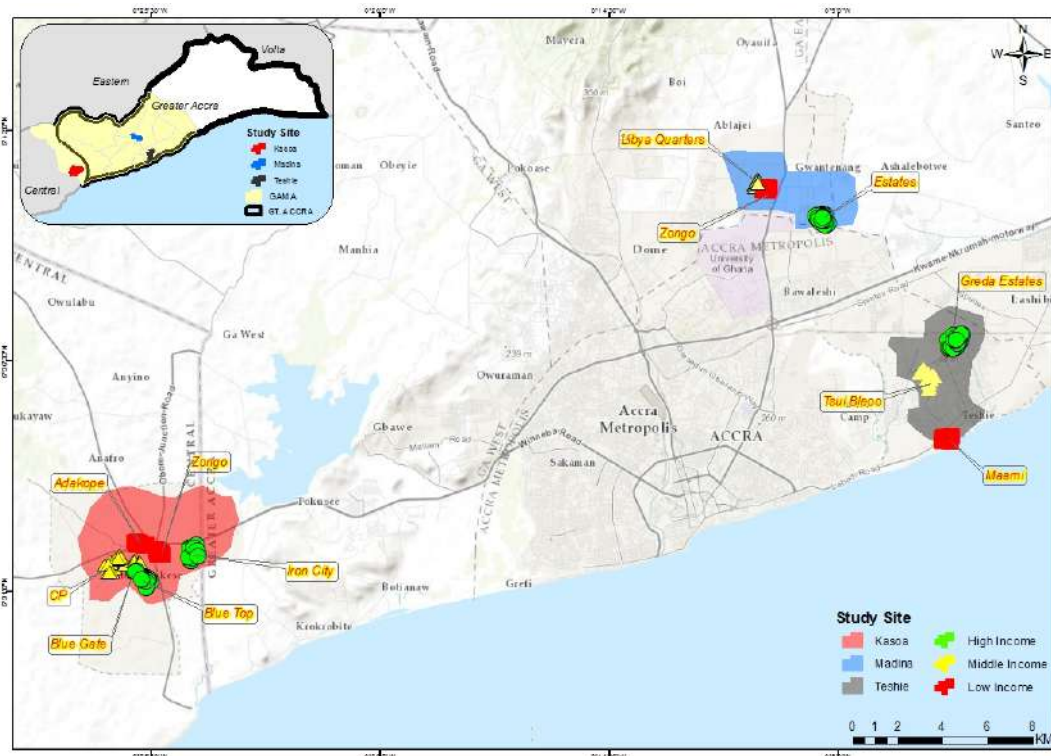


Figure 1.A map of the study area
Source: Author’s construct, 2014

Sampling Framework

Earlier studies (Behrens et al., 2006; van der Reis and Lombard, 2003; Godard, 2000) have found that the determination of an appropriate and adequately representative sample size for surveys conducted in developing countries where resources are relatively scarce is a huge challenge. While large sample sizes may be considered ideal (Twumasi, 2001; Kitchin and Tate, 2000), the incidence of non-sampling errors may be inevitable (Yansaneh, 2005). The population in the study areas is in excess of 100,000. Generally, for a population of that size, a sample of 400, with a ± 5% error margin, a confidence level of 95 % and a 0.5 maximum variability is considered ideal (Yamane, 1967; Israel, 1992).

A stratified multistage cluster random sampling design was employed to select respondents for the household surveys. The application of the multi-stage sampling technique is justified due

to the virtual non-existence of a proper residential address system and/or fixed telephones in some parts of Accra (Yansaneh, 2005). Low levels of education, especially in the high-density low-income areas have also necessitated the adoption of this sampling technique (Behrens et al., 2006). The multistage sampling design was implemented in two stages. In stage 1, a stratified sampling of residential units into clusters was performed following a reconnaissance survey of the three localities. Stratification assumes that the population within a particular class will exhibit similar socio-economic characteristics. Thus, based primarily on dominant housing characteristics which served as the proxy for various socio-economic classes, twelve study sites or localities were identified. The next stage of sampling involved the allocation of sub-samples to each of the selected localities (Table 1). Households in these areas represented the primary sampling unit.

Table 1. Sampling framework for household survey on short distance trips

| | Kasoa | | Madina | | Teshie | |
|-----------------|------------|------------|------------|------------|------------|------------|
| Income Clusters | Study site | Sub-sample | Study site | Sub-sample | Study site | Sub-sample |
| Low | Zongo | 25 | Zongo | 36 | Maami | 47 |

| | | | | | | |
|--------------|-----------|------------|-------------------|------------|---------------|------------|
| | Adakope | 25 | | | | |
| Middle | CP | 50 | Libya Quarters/UN | 36 | Tsui-Bleoo | 47 |
| High | Iron City | 20 | Madina Estates | 36 | GREDA Estates | 47 |
| | Blue Gate | 15 | | | | |
| | Blue Top | 16 | | | | |
| Total | | 151 | | 108 | | 141 |

Source: Fieldwork, 2014

The primary data was generated through structured questionnaires. Respondents were required to answer questions designed around two key thematic areas. These are trip behaviour as well as personal characteristics of survey respondents. Concerning the trip behaviour characteristics, the respondents were asked to show their main transport mode (i.e. the transport mode that covered the longest distance of their journeys) to the main community market, the frequency of use of these modes, and mode-specific attributes, which influence their choice of modes.

Finally, demographic and socio-economic characteristics of respondents, such as gender, age, educational attainment, and income were elicited through the questionnaires. The generated data were analysed using SPSS 18 software. The analyses include cross-tabulations to show variations in mode choice by gender, age, education status, and trip distances. The Pearson's chi-square was used to test the statistical significance between mode choice and these independent variables. The Odds Ratio was calculated using the Forced Entry Method in logistic regression analysis. This allows all the predictor variables to be tested simultaneously while controlling for multi-collinearity. During the household surveys, the precise locations of houses where respondents were interviewed and the local community markets were picked using the hand-held global positioning systems (GPS) devices. With the use of the buffer geoprocessing application in ArcGIS 10.4 extension, proximity analyses were performed with distance intervals of 1000 metre from the trip destinations, i.e. community markets. This analysis was performed to identify variations in mode choice with increasing distance away from the markets.

3. Results

3.1 Data Characteristics

A total of 363 valid responses, representing 90.8% of the total sample was obtained and used in the analyses. As seen in Table 2, while males dominated the Kasoa sample, more females were found in Madina and Teshie. In terms of age, respondents between the ages of 20-45 were in the majority with those under 20 years being in the minority in all three study locations. Generally, the majority of respondents had obtained low levels of education. These are people who have obtained at most senior high school education and below. This category of respondents is followed up by others who have attained high education at the university and polytechnic levels. With respect to distance away from the local community markets, most respondents are found to reside within a 2000 metre radius in both Kasoa and Madina. Interestingly, the data did not show residential location beyond 4000 metres in these two communities. This indicates that the majority of residents stay much closer to the trip destination. However, in Teshie, the majority of respondents are found so close to the community market, within a radius of 1000 metres. While some respondents were found to live about 4000 and 5000 metres respectively away from the main community market, they still made regular visits to Lascala Market for their shopping needs. Walking was found to be a major source of mobility for surveyed respondents.

Besides active transport modes, motorised transport modes remain popular in the surveyed communities. Taxis were mostly used in Madina, where strangely none of the respondents indicated their use of trotros which are quite commonly used in the two other communities. The use of motor and pedal cycles was comparatively low both in Kasoa and Madina. In the Teshie sample, none of the surveyed trip makers indicated their use of motor and pedal cycles.

Table 2. Overview of respondents and their trip characteristics (%)

| Variable | Elements | Kasoa (n=146) | Madina (n=104) | Teshie (n= 113) |
|-----------|--------------------|---------------|----------------|-----------------|
| Gender | Male | 53.4 | 47.1 | 46.0 |
| | Female | 46.6 | 52.9 | 54.0 |
| Age | Less than 20 years | 3.4 | 0.0 | 0.9 |
| | 20-45 years | 72.6 | 80 | 61.9 |
| | 45-60 years | 18.5 | 14.4 | 30.1 |
| | Above 60 years | 5.5 | 5.6 | 7.1 |
| Education | No formal | 6.2 | 13.5 | 7.1 |
| | Low | 61.6 | 46.2 | 69.9 |

| | | | | |
|----------------|-------------|------|------|------|
| | High | 32.2 | 40.4 | 23 |
| | 1000 metres | 33.6 | 26 | 37.2 |
| | 2000 metres | 60.3 | 50 | 5.3 |
| Trip distances | 3000 metres | 6.1 | 24 | 25.7 |
| | 4000 metres | 0.0 | 0.0 | 16.8 |
| | 5000 metres | 0.0 | 0.0 | 15 |
| | Walking | 32.2 | 31.7 | 31.9 |
| | Bicycle | 1.4 | 1.9 | 0.0 |
| Modal Share | Motorcycle | 2.7 | 2.9 | 0.0 |
| | Trotro | 26.7 | 0.0 | 38 |
| | Taxi | 19.9 | 34.6 | 6.2 |
| | Private car | 17.1 | 28.8 | 23.9 |

Source: Fieldwork, 2014

3.2 The role of trip distance on mode choice

A Chi-square test shows a statistically significant relationship between distance ($P < 0.001$) and mode choice in all three communities surveyed. This implies that distance significantly explains the type of mode choice used by trip makers when they make their shopping-related trips. As seen in Table 3, within a 1000 metre radius from the homes of trip makers, an overwhelming majority of respondents – as high as 72% principally walk, or to a lesser degree, bike. When trip distance increases to 2000 metres, there is -64.7% decrease in

the use of active transport modes among trip makers surveyed. A further increase in trip distance shows a consistent decrease in the use of active transport modes to the extent that at 5000-metre radius, none of the respondents reported walking as a mode of transport. On the other hand, when the distance increases from 1000 to 2000 metres, the data show a 251.5% percent increase in the use of motorized transport modes. With increasing distance, there is a consistent high use of motorized modes of transport and that by 5000 metres, all respondents had completely switched to one form of car use or the other.

Table 3. Mode type by trip distance to community market (%)

| Distance (in metres) | Non-Motorised | Motorised | Total sample size (n) |
|----------------------|---------------|-----------|-----------------------|
| 1000 | 72.0 | 28.0 | 118 |
| 2000 | 20.5 | 79.5 | 146 |
| 3000 | 7.9 | 92.1 | 63 |
| 4000 | 5.3 | 94.7 | 19 |
| 5000 | 0.0 | 100 | 17 |

Table 4 presents results from a Logistic regression analysis. When all the predictor variables are modelled together, again trip distance ($P < 0.001$) was found to be a significant predictor of mode choice. Trip makers who lived from between 2000 and 5000 metres respectively, categorized as “far” were 12 times less likely to walk or bike when they commute to the market. Also, education ($P < 0.005$) significantly predicted mode choice. Trip makers with low levels of education are 2.6 times less likely to walk compared to those with no formal education at all. Also, highly educated trip makers had decreased odds of walking by 5 times compared with their counterparts who have received no

formal education.

Though gender was not found to be a significant predictor of mode choice, males are slightly more likely to use non-motorised modes than female trip makers. In addition, there was no statistically significant relationship identified between the age of trip makers and their mode choices, it does seem that as trip makers grow older, the tendency to walk decreases. For instance, compared to very youthful trip makers (below 20 years), trip makers who are aged between 20-45, 45-60 and those above 60 years had decreased odds for walking by a factor of 5.0, 1.5 and 2.3 respectively.

Table 4. Logistic regression analysis of variables associated with mode choice in Accra

| | B | S.E. | Wald | df | P | Odds ratio | 95% C.I. for Odds ratio | |
|------------------|--------|-------|-------|-------|-------|------------|-------------------------|-------|
| | | | | | | | Lower | Upper |
| Gender | 0.066 | 0.298 | 0.049 | 1.000 | 0.824 | 1.068 | 0.595 | 1.918 |
| <i>Female</i> | | | | | | 1.000 | | |
| Education | | | | | | | | |
| High | -0.968 | 0.480 | 4.067 | 1.000 | 0.044 | 0.380 | 0.148 | 0.973 |
| Low | -1.686 | 0.563 | 8.978 | 1.000 | 0.003 | 0.185 | 0.061 | 0.558 |
| <i>No formal</i> | | | | | | 1.000 | | |

| | | | | | | | | | |
|----------|--------|-------|--------|-------|-------|--------|-------|-------|--|
| Age | | | | | | | | | |
| <20 | | | | | | 1.000 | | | |
| 20-45 | -1.599 | 1.330 | 1.445 | 1.000 | 0.229 | 0.202 | 0.015 | 2.740 | |
| 45-60 | -0.406 | 0.573 | 0.502 | 1.000 | 0.479 | 0.667 | 0.217 | 2.048 | |
| >60 | -0.851 | 0.642 | 1.758 | 1.000 | 0.185 | 0.427 | 0.121 | 1.502 | |
| Distance | | | | | | | | | |
| Far | -2.490 | 0.290 | 73.743 | 1.000 | 0.000 | 0.083 | 0.047 | 0.146 | |
| Near | | | | | | 1.000 | | | |
| Constant | 2.327 | 0.676 | 11.847 | 1.000 | 0.001 | 10.243 | | | |

Note: the reference categories for the various categorical independent variables have been italicised in the model.

Source: Fieldwork, 2014

Discussion

The purpose of this paper was two-fold. First, it sought to examine what urban trip makers in Ghana consider an acceptable distance for choosing active transport modes. Second, mode choice factors for intra-community trips are also examined. With respect to objective one, the study found that a majority of trip makers surveyed significantly switch to motorized transport modes beyond 1000 metre radius from their trip destinations. One can, therefore, conclude that the 'walkability distance' in Accra, Ghana is 1000 metres, consistent with earlier international studies, including those carried out in Germany (Scheiner, 2009); Canada (Millward et al., 2013; Seneviratne, 1985), India (Rahul and Verma, 2014) and in Malaysia (Azmi et al., 2012). The role of distance in influencing choice has been highlighted in earlier studies (Cobbinah and Amoako, 2014; Cervero, 2013). A major implication of this finding is that walking was a dominant source of mobility for surveyed respondents. This is not particularly surprising since commute distances are relatively shorter. This is consistent with findings of earlier studies conducted in American and Western European cities (Naess, 2012, van Wee, 2002) as well as in some cities in developing countries, including Santiago, Taipei and Hong Kong (Cervero, 2013; Zegras, 2012). These studies have consistently demonstrated that the siting of facilities nearer to commuters promote usage of active transport modes.

The study surprisingly found that the use of motor and pedal cycles in both Kasoa and Madina, particularly in the Zongo neighbourhoods where the majority of residents are Ghanaians of Northern descent was remarkably low. This is because while cycling is generally unpopular in the southern parts of Ghana, it is a very popular active transport mode in Northern Ghana. This surprising finding contradicts an earlier study (Grieco, Turner and Kwakye, 1994) that sampled GAMA residents in Nima, the majority of whom had migrated southwards from Northern Ghana, which concluded that cycling was not only high but was also seen as a culturally acceptable means of transport. The low use of bicycles, in particular, may

be accounted for by the fact that in Northern Ghana, motorised transport modes are relatively few than in Southern Ghana. Thus, fatalities and injuries arising from collisions between cycle riders and fast-moving cars are much lower. However, in the highly urbanised southern parts of Ghana, the high use of motorised transport modes makes cycling very risky. Again, the infrastructure and appropriate legislation for non-motorised transport mode operations in Accra are woefully inadequate.

In addition, it was found that even for such relatively shorter trip distances, motorised transport modes still remain popular in the surveyed communities. This may partly be explained by the lack of infrastructure and the general enabling environment to consume active transport among surveyed respondents in Accra. As noted elsewhere, the provision of adequate infrastructure and security promotes active transport use (Meleis, 2011; Li, 2003).

Besides the influence of geographical factors regarding active transport, this study found that personal characteristics of trip makers, notably education, significantly determined the choice or otherwise of active transport. Contrary to Loutzenheiser's (1997) study in the US, this study found that walking or biking was remarkably low for the highly educated and high-income trip makers. This finding may confirm what earlier studies have noted that walking in poor countries, including sub-Saharan Africa, is usually performed by the poor and vulnerable (UN-Habitat, 2011; Cervero, 2013). Thus, with increasing disposable incomes, most people are likely to switch to motorized transport modes.

Though gender was not found to be a significant predictor of mode choice, males are slightly more likely to use non-motorised modes than female trip makers. This finding contradicts an earlier study (Cervero and Golub, 2007) which concluded that walking was basically a female-dominated activity.

In addition, there was no statistically significant relationship identified between the age of trip makers and their mode choices, it does seem that as trip makers grow older, the

tendency to walk decreases. This may be explained by increased disposal incomes that make both private and commercial car use affordable and perhaps ageing may be accompanied with reduced vigor and stamina –key ingredients needed for active transport. This finding, however, appears to challenge van Acker et al.'s (2007) study which found high levels of walking among the aged in Europe possibly due to the perceived health and environmental benefits which are attached to active transport.

4. Conclusion

In a nutshell, the role of geography in determining mode choice is seen from two main aspects –one physical and the other, social. On the physical front, walking and biking, for instance, are common among residential locations such as Zongo and Adakope (in Kasoa); Zongo (in Madina) and Maami (in Teshie) which are found much closer (1000 metres) to the community markets. On the social side, these communities are also among the very low-income neighbourhoods and the majority of residents here are illiterates and semi-literates. On the other hand, car use is high for trip makers who live in the middle and high-income neighbourhoods such as Iron City, Blue Gate and Blue Top (in Kasoa); Madina Estates (in Madina) and Greda Estates (in Teshie).

Thus, in order to make cities inclusive, safe, resilient and to address the mobility concerns of the poor and less educated who usually walk, policy actors must, in the short to medium term, put in policies to prevent encroachment of walkways by brisk commercial activities and also provide adequate lighting and security, especially at night. In the long term, policy makers must provide extra pedestrian walkways with a particular focus on the first 1000 metre radius from the homes of trip makers to major markets or trip destinations. The study is limited by not including mode choice for work-related trips made over a short distance. Also, data on incomes of respondents were not regressed due to inaccuracies observed in the preliminary analyses. Thus, future studies are encouraged to explore this theme in order to come up with an extensive overview of the patterns of trip behavior for active transport in Ghana.

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Research on the Big Data of Tourism Products Based on the Internet

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Abstract: With regard to the development trend of the tourism market and the current "big data" hot issue, this paper proposes the term of tourism products big data based on the enterprise management, puts forward the necessity of analyzing and mining the tourism products big data; through the comparative analysis of tourism big data and big data of tourism products, it also combines with examples to illustrate the priorities and functions of these three aspects. This paper emphasizes that researches on product big data can enhance (optimize) the enterprise's tourism products competitiveness, marketing mode, customer satisfaction, the combing of product service process and links, as well as the ability of rebuilding. The last part of the paper elaborates the big data processing method based on granular computing, and emphatically analyzes the constitution and access of tourism product big data, divides the data into 7 categories and 31 subcategories, and classifies the data information into static, relative dynamic and dynamic three types.

Key words: applied big data, tourism product big data, granular computing, tourism big data, Acquisition and application of big data of tourism products

Introduction

The biggest contribution of the Internet is the change in the way of information dissemination and communication, which has essentially reduced the cost of information interaction between buyers and sellers. The Internet, to say it informally, is a carrier and channel for data information, and the numerical information that is being loaded onto the carrier is data. Data has given consumers an unprecedented power to dominate commercial activities, helped to achieve the quick and high-frequency information interaction between buyers and sellers, and realized the maximization of interests for both parties. Here, the data can be either numeric or text, image, voice, etc., it can be used for the purposes of scientific research, design, verification, etc.

1. Origin of researches on the big data of tourism products

1.1 Necessity of big data applications of tourism products for tourism enterprises

The relevant statistics in tourism industry show that in recent years, China's tourism market has seen high speed growth every year. The number of tourists making independent travels grew at an average annual rate of 30 percent, in comparison, traditional group tour grew at a rate of 15 percent, which has slowed down in recent years. The proportion of Chinese tourists going overseas for independent travel in all Chinese outbound tourists rose to over 70 percent. The development of independent travel is likely to cause the popularity of customized tours to soar. As an "updated version" of

independent travel, customized tours are characterized by freedom, immersive experiences and personalized services, in addition to giving full consideration to consumer needs and making tours more comfortable.

As we can see, the ideas of tourism products can win the market by relying solely on low prices and "small profits but quick turnover" can be a reasonable marketing strategy do not actually hold water. Customization is not the demand of a single point, it indicates a problem that the market requires such tourism products that are not only rich, but also able to meet personalized requirements. If we simply make a transformation from large scale production to customization, there will be enormous challenges for tourism enterprises to manage it. Besides, tourism products depend relatively on other product elements such as traffic, food service, accommodation, tourist spots, and customization lack of guidance will let tourism enterprises fall into the quagmire of repeated resources integration.

So, for tourism enterprises, how to guide customers to enhance their ability to participate in the positive and reasonable customized tourism products under the precondition of not discarding their main lines is not an easy question with ready solutions. To solve this problem, tourism enterprises must regard relevant data as the breakthrough point and try to find an effective way to continuously enhance the competitiveness of their products from a huge amount of data which is seemingly unrelated.

1.2 Practical significance of big data applications in all industries (including the tourism industry)

In most cases, the big data that people often say is the

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application of massive amounts of data generated on the Internet. Many overseas research institutes and colleges have a relatively broad definition of big data: the application of mathematical algorithms to huge amounts of data to predict the likelihood of events. Specifically, big data refers to the information technology and the way of thinking to tap the potential value of enormous data from different types through mathematical analysis, so as to describe the status quo, find out problems and predict the tendency. The ability to fetch, store and analyze massive man-machine data to make predictions is the so-called "big data", and the mining and utilization of big data has now become a new economic growth point and the source of quality benefit.

The relevant technology of big data has been applied in almost all sectors, including national fundamental database and information processing whose business is to promote information sharing and business synergies and to improve administrative efficiency and service level; Logistics public information services, the development of modern logistics requires multiple sources, vast quantities of data, and time and space data resources. And data integrated processing information value-added products mining, Internet of things, cloud computing, mobile communications, digital earth and other supporting technologies; E-commerce and enterprise information management whose emphasis lies in the information discovery, mining and business recommendation of the potential customers, etc.

The typical applications of big data in the tourism industry are as follows:

First, we will increase the precision and cross-boundary integration abilities of digital marketing has been increased. For example, regular precision has been targeted at customers by combining some of their basic consumption habits and information; Rapid screening and steady increase of target customer group has been completed by analyzing those seemingly unrelated but somehow internally connected user data and information through a cross-border way.

Second, the interactive competence of mobile data has been improved. For example, the two-way functionality of the client APP has been enhanced, instead of simply using single channels such as letters, emails, text messages, and websites to expand their customer base. More dual-channels have been adopted, for instance, APP push, WeChat push and other methods have been adopted to improve the customer bonding. For customer groups on the use of APP consumption, some not classified personal information have been gradually analyzed, to improve the precision of target population screening including frequently-used geographical location, consumption habits and other data.

Third, consumer demands have been refined. Products and services have been constantly enhanced and improved through the interactive inquiry before buying, travel notes and photos posted in using the product, and the final evaluation of customer satisfaction, so as to improve their core competitiveness.

Fourth, traffic monitoring has been conducted on scenic spots

and tourist destinations.

2. Research status

2.1 Distinction of different concepts

Tourism big data is the combination of tourism and big data which focus more on the general direction of the tourism industry, giving a relatively broad guidance for development and the trend of the whole industry. From the point of view of technology application, tourism big data owe more to the application of big data acquisition method, deductive method, research method and using models in the tourism industry.

Tourism itself covers massive information of food, accommodation, travelling, tour, shopping and entertainment, but tourism big data is not merely to look for relation, conduct statistical analysis, trend analysis or carry out some regression analysis according to basic models on the massive data restricted by the "tourism industry". Very often, tourism big data also care for data across borders which starts from the tourism industry, but aims at industries related and interactive with the tourism industry. For example the transportation, telecommunication, retail and finance, are target industries that are easy to search for data links and soft associations across borders. . By using other industries have been big data results or trends to help you prepare a barometer to control, and logic can be loosely coupled data to help master the industry trend make timely grasp and adjust accordingly.

Tourism product big data and tourism big data is linked to each other, have some overlap, but not identical, although to a certain level, they have very strong interoperability, but there exists a significant difference between the two. The big data on travel is broader than the big data. Tourism product is a big data research through tourism products related to the internal and external data collection, accumulation, sorting, adjust try association, association rules and to build the scientific method and data processing technology to improve (optimization) the competitiveness of tourism products, marketing model, customer satisfaction, product service processes and link the combing ability and means and reproducing.

In a nutshell, tourism product big data is not only concerned about customer needs, and from the actual data and predictive data to improving customer demand the fine aspects of satisfaction to enhance the core competitiveness of products and service, improving the capacity of tourism product combination nested, customized, the product quality and follow-up service quality are put on a stage. The product's added value creates a better experience for the customer, making the product more profitable for the product.

2.2 Previous researches on big data in the field of tourism

At present, the domestic research of big data is tourism, many scientific research institutions, the administrative department, business organizations, large travel and big data service specialized company, in the method of some of the big data and try to figure out their own big data, using method and application of trigger logic. Li pointed out that big data is the best platform for users as users. From

the user's portrait, precision marketing to the user level, to explore how to use big data to travel services, upgrade tourism public service system, based on big data using existing underlying database offers visitors online intelligent public advisory services. Senior analyst at sun pointed out that the tourism the asset-like path of big data, the use of media data for their own operations, to a third party to provide a clear and structured travel data content, set up big data platform provide consultation service for tourism, promoted to become a media type, a think-tank.

Professor Zhu Puxuan pointed out that using big data accurate and personalized service for enterprises, such as big data to shunt tourists to the Potala Palace, the effect is very big. Shao Daming pointed out that big data is more focused on tourism tourists psychological research analysis and experience tourism products, to the big data is applied to the actual experience of tourists, let the department know the change of the tourism industry of tourism, tourists travel behavior, in order to provide more targeted products and services. Dr Chen pointed out that big data can accurately grasp the needs of tourists, for the traffic surveillance, public opinion judgment and marketing to be more accurate and targeted marketing services, improve tourist experience. Again, such as, golden palm enterprise organization, points out that tourism big data big data power industry regulation, including: monitoring, emergency rescue, destination price guidance; Tourism big data helps market forecasts.

Overseas scholars also put their viewpoints on the application of big data in the travel industry, studying the characteristics, attributes and the impact of big data on travel companies. Professor Thomas h. Davenport study combines the Amadeus, Opera Solutions, Marriott, such as more than 20 tourism enterprise case, more pertinently pointed out that comprehensive tourism product the advantages of big data, challenges, and big data can help tourism enterprise restructuring process, optimization of earnings management, improve distribution capabilities, will be highly customized business travel, improve financial management ability, etc.

2.3 Previous researches on the big data of tourism products

Tourism product data at present, though there is no clear definition and research achievements, but by the author for tourism at home and abroad big data references and data mining analysis, discovered the big data for tourism products, embodied in: the use of big data for tourism product customization ability level, cost control, improve tourist satisfaction response and big data can make the trip more concentrated in the visitors' needs and preferences.

Tourism products as special products have a relatively special internal data affinity and unpredictability of internal data and external data. Let's take a look at the big data from a travel product to further understand and understand. A tourist product, from Shanghai to Sanya, time 5 days.

First of all, the destination information, Sanya, China is in the tropics, which is very popular with thunderstorms and typhoons. In typhoon, for example, every year there are about 20 typhoons will

affect our country, however, basic on 7, 8, 9 the three months of July, August and September, and there will be four or so commonly the typhoon will directly affect the Sanya. And Sanya is an island city, with the exception of outdoor entertainment, which has no great attractions for indoor attractions. Therefore, there are many ways and means for this tourism product to reduce the negative feelings caused by typhoon (tropical cyclone) such as increase the trip a day or two, and influence of the typhoon in 1 to 2 days arrange other indoor activities (because of the typhoon influence on Sanya for the longest time in the history of no more than 8 hours). Arrive or start a flight to avoid the time period when the typhoon arrives or is affected. Or avoid selling or operating travel products during and around the time of the typhoon. Of course, all of these ideas need to be seen in response to the market and customer feedback. And, in the adjustment of the product on the strategy of effective utilization of interaction with customers, in the process of booking is clearly know the customer feedback to adjust and tendencies. Don't let your customers feel the opposite way. Instead, let the customer experience the thoughtfulness of the product and the full scale of the service.

Followed by transportation, basic it is to choose the plane, but Shanghai to Sanya to remove China Eastern and China southern is a round-trip flight every day, the airline, spring airlines is a day every other day to fly, airlines generally there is a season, we can help airlines freight big data information, adjust period preferred partners and possible partners. Objectively speaking, tourism product designers tend to think much of the price factor, in fact, punctuality rate of the carrier as well as the load factors of the fixed route is necessary as a reference. If the price is low, it is the latter part of the string, which is very dependent on the flight of the previous flight, and there are more uncontrollable factors, and the rate is generally not very high. Moreover, such as the flight has been delayed for too long, the back of the schedule will be stretched, visitors will be in a hurry deployment in shortening the time line to complete the scheduled target, tourists will feel and difference, in the process of booking products for defects will be obvious. If you are more interested in the customer's seat preferences during the flight, the details of the product will be improved by the window or aisle.

If you're a well-trained eater, you shouldn't have meat on your flight and on your journey. If you have a seafood allergy or gout, you should avoid seafood. Also, when planning meals at your destination, you need to be fully aware of whether visitors want to go out and eat local snacks, such as seafood platoon. There are some guidelines for food. But if you're prepared and Shared by your own limited resources and resources, there's a sense of loss. If and specializes in food or strategy guide channel operators, to them in an area at the top of the recommended restaurants do before a resource sharing will produce a win-win situation, and visitors can also because of such intimate service and improve the comfort of travel.

From the product reservation process, both the APP and the site will need to be enhanced to identify and identify new users or older members. The new and old memberships are no longer differentiated

by whether they are useful or not. Instead, focus on whether you know the customer's travel preferences, dietary preferences, and preferences. Use of big data and crossover industry big data help to refine products and service are put forward, through feedback to help improve product show of force and fast reading ability. Try to avoid a lot of steps in a booking process, constantly interact, have a little notice and start over again. And after the customer confirmation of order needs through effective measures, such as: WeChat, E-mail, SMS, etc.) to confirm, and the corresponding auxiliary information push of tourism in place. Before the customer is about to travel, they will be able to push out relevant information such as flight information and weather information.

Finally, the passenger fatigue. Now people pays attention to the quality of life, like wearing a bracelet, not only can help you monitor heart rate, step down can also understand your deep sleep time. In fact, every movement bracelet has an SDK (authentication code). Tourism product designers can use and movement provider for part of the bracelet and fatigue related information, in the case of customer approval to do a good job of corresponding monitoring, which can use quantitative data to help themselves to improve the product's physical strength requirement, and can help the tour guide to pick up or tourists themselves do our strengths, to avoid some unnecessary danger happening.

In fact, the more modular, more data-oriented travel products are not only available for quantifiable and highly customizable products. This paper argues that tourism enterprise operators and managers need to focus on tourism products big data (information, Internet information, information interaction, using the valuable tourism product data found new profit point, improve the value of tourism products and shorten the product optimization time.

3. The application prospects of the big data of tourism products

This paper argues that big data of tourism products has the same characteristics as what is commonly referred to as big data, i.e. the four Vs of big data, namely large amount of data (Volume), high speed calculation (Velocity), many different types (Variety) and low value density (Veracity). The general method and means of big data research in other industries are also suitable and practicable to relevant research activities in tourism industry: data acquisition, platform building, model establishing, data analyzing, and so on. However, there is no strict standard of tourism products themselves, and the big data of tourism products have special industry characteristics, which are more dependent on other industries. We can actually make full use of the big data analysis results of tourism industry and its adjacent industries, so as to "make force from a borrowed force" and pave the way for tourism product data integration and application.

Through the acquisition, storage, manipulation and calculation of relevant data of tourism products and the related factors influencing the tourists experience, we can enhance the overall value

of the tourism products and customer satisfaction, so that make the operation and management of the upstream tourism enterprises closer to the market.

3.1 Method exploration: granular computing

Granularity plays an important role in the design and implementation of intelligent systems. Granular computing is used in the process of solving the problem of "size" of all the theories, methods, techniques, and tools "tag", granular computing is not a specific model or method, but a methodology.

Information granulation aims to establish based on the external world, effective, and the concept of user-centered, at the same time simplify our understanding of the physical world and virtual world, can efficiently provide the exact solutions for a class of "utility". From the perspective of artificial intelligence, granular computation is the natural mode of simulating human thinking and solving large-scale complex problems. In order to solve the problem, the problem can be solved by using the feasible satisfactory approximation solution. From the data analysis and processing level, granular computing from the complex data information with information instead of samples as the basic unit of calculation, can greatly improve the computational efficiency.

Granular calculation mainly consists of data granulation, multi-granularity pattern discovery and integration, multi-granularity/cross- granular reasoning, etc.

Granular computing is a computational paradigm for simulating human thought, so it is important to analyze how each model fits into the subjectivity of the analyst. Big data analysis emphasizes the relationship between data, so it is important to compare the granular structure of each model (the relationship between the layers and the relationship between the particles).Based on granular computing of big data processing, data acquisition, extraction, cleaning, integration between, say, analysis, modeling, interpretation has clear correspondence).Data granulation is based on the data analysis based on granular computation, which is the process of decomposing complex data into information granular according to the given granular strategy. Multiple granular policies can be adopted based on different data modeling goals and user requirements. The big data granulation of tourist products first needs to be studied for data acquisition, data acquisition and data source.

3.2 Acquisition and application of big data of tourism products

As previously mentioned, tourism product big data is not completely the same as tourism big data, through the analysis, deductive tourism product data can be conducive to tourism enterprises optimization products and services. Then, combining with the particularity of tourism products and tourism products big data analysis, the purpose of the first need to decide and identify which belong to the category of tourism product big data research data.

The most influential domestic tourism product definition is proposed by Lin Nanzhi and Tao Hanjun, "from the perspective of

tourism destination, tourism product is referring to the tour operators with tourist attractions, transportation and tourism facilities, to provide tourists to meet the demand of the tourism activities of all services", "from the perspective of tourists, the tourism product is referring to the tourists spent a certain amount of time, cost and energy for an experience".

Foreign scholars Smith S. tourism product definition is at the heart of tourism products are the result of tourism enterprises to interact with tourists, tourism enterprises to provide tourists travel experience is the final product. Foreign scholars generally agree with the idea that tourism products are a tourist experience for tourists.

As you can see from the above definition, the tourist product is a very residential experience and a tourist experience. Secondly, tourism enterprises will provide tourists with a range of products and services, such as transportation, hotels and scenic spots. Therefore, the factors of tourism products include transportation, hotels, tourist attractions, etc.

Tourist traffic covers a wide range of traffic, including transportation between tourist destinations and destinations. Set off the east coast of the United States for example Shanghai tourism products, Shanghai is a major transportation service to New York, New York can be a flight to the next destinations Boston can also be a tour bus. For big transport planes, different airlines have their own service characteristics, and there are differences in the time and price of flights. The normal rate and rate of flight are also important for travel products, and flight delays will have an impact on overall travel arrangements.

Different travelers have different requirements for hotel location and hotel facilities, for example, shopping will choose a hotel where you can move in. Vacationers have higher requirements for hotel facilities. If a tourist is a VIP of a hotel chain, it will be a priority to consider the hotel brand in order to satisfy the purpose of his travel. The same hotel, different room price is different also for guests' island swims, in front of the sea will be more attractive because of good watch scenery effect, but the price will be much higher than other room types.

Tourist attraction is the motive of tourists' travel. Wu Jinfeng believes that with the group of natural, economic, social, cultural, political, technology has significant differences, and make the attractive to potential tourists' tourism destination (including natural, economic, social, cultural, political, technological, etc.) of things or phenomena is defined as tourist attractions. Ma Ling thinks that the connotation of the tourist attractions can be understood as: "the tourist attractions is relative to the visitors the attractiveness of the objects; its attraction can be divided into absolute and relative attractiveness. Absolutely attractive from the tourist attractions of some kind of special objective attributes, while relatively attractive from the symbolic attribute of the tourist attractions, that is, the object to become a symbol for the tourist value identification. This paper argues that tourism destination attractions including the scenic area, recreational activity (or event) concert, festival activities, folk

customs, institutions and certification logos, landscape symbolic significance. Tourists to visit Taiwan is mainly to watch a Jay Chou's concert, mid to late August to go to Tibet is chosen to attend traditional Tibetan Sholton Festival. The Oriental Pearl Tower and the Jiuzhaigou Resort are places where tourists yearning, a symbol represents Shanghai scenic spot, and another is the world's heritage.

In addition to the attractions, there are also weather conditions, public transportation, and the off-peak season factors that affect the experience of the destination.

From what has been discussed above, some data will affect visitors and tourism product sales experience, can be used to analyze these data, and for the tourists experience and custom service to provide intelligent, Table 1 will be big data has carried on the elaboration and the classification of tourism products.

Table 1. Classification of tourism product big data

| No | Item description | Data type |
|-----|--------------------------------------------------|--------------------|
| 1 | airplane | |
| 1.1 | airline company | static |
| 1.2 | flight timetable | relatively dynamic |
| 1.3 | flight punctuality | relatively dynamic |
| 1.4 | air fare | dynamic |
| 2 | traffic condition around the tourist destination | |
| 2.1 | public transport system | static |
| 2.2 | taxi | static |
| 2.3 | tour coach | static |
| 2.4 | car rental agency | relatively dynamic |
| 3 | hotel | |
| 3.1 | location | static |
| 3.2 | hotel facilities | static |
| 3.3 | services | static |
| 3.4 | hotel fame | static |
| 3.5 | room price | dynamic |
| 4 | meteorological data | |
| 4.1 | tourism-generating region | dynamic |
| 4.2 | tourist destination | dynamic |
| 5 | tourist attraction | |
| 5.1 | cultural and sports activities | dynamic |
| 5.2 | cultural attribute | static |
| 5.3 | peak/slack season of tourism | static |
| 5.4 | natural landscape | static |
| 5.5 | facilities | relatively dynamic |
| 5.6 | tourist commodities | static |
| 5.7 | certification | static |
| 5.8 | landscape symbolic significance | static |
| 6 | customer(tourist) | |
| 6.1 | gender | static |
| 6.2 | age | relatively dynamic |
| 6.3 | occupation | relatively |

| | | |
|-----|---------------------|---------|
| 6.4 | consumption history | dynamic |
| 6.5 | hobby | dynamic |
| 6.6 | fatigue | dynamic |
| 7 | mass media | dynamic |
| 7.1 | travel notes | dynamic |
| 7.2 | word of mouth | dynamic |

In this paper, data is divided into 7 categories and 31 subcategories, and there are three basic types of data, namely static data, relatively dynamic data and dynamic data. The first type is solidified data that almost will not change, because the structure is relatively stable; the second type is relatively dynamic data, which changes after a certain period of time; and the third is dynamic data that can change at any time.

The sources of tourism product big data include:

First, through the Internet, health, financial, economic, traffic and other activities of various kinds of data, including Weibo, text, graphics, video and other information. For example, consumer records, travel destinations, destination travel and word of mouth.

Second, all kinds of computer information system data, such as files, database, multimedia form, also including automatic generation of logging information, such as passenger traces in the operation of e-commerce platform.

Third, the data collected by various digital devices, scientific experiments and observation. Weather conditions provided by meteorological systems.

According to what mentioned above, big data analysis emphasizes the relationship between the data, according to the data modeling of different target and user needs, can adopt the strategy of a wide variety of graining. The tourism enterprise can analyze the above data according to the grain strategy.

4. Conclusions

This paper first clarified the differences and relation between big data in the field of tourism and the big data of tourism products, then put forward some new ideas on the big data of tourism products, and further explained and emphasized the importance of the big data application in the marketing of tourism products for tourism enterprises through the analyses of application examples. This paper focused on the feasibility study on the application of big data in the marketing of tourism products, without making any analysis at the level of granular and granular layer by utilizing specific strategies, the latter will be the author's direction of further efforts.

It is also hoped that this paper can serve as a modest spur to induce more researchers in the future to come forward with their valuable contributions in big data research on tourism products based on tourism enterprise management innovation.

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Study on the National Security Review Legislation Related Issues of China's Foreign Direct Investment

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Abstract: China has become one of the capital output countries in 2018.^[1] The dual identity of investment in the host country and the home country put forward a severe challenge for China's foreign investment legislative reform. The BIT negotiation between China and the United States is still in process, the reform of China's foreign investment law is also still in progress. That is one of the important principles of drafting the "the people's Republic of China for Foreign Investment Law (Draft)" that foreign national security review system being incorporated into the law of foreign investment and further improved in it. This article is intended for improving the design of the system of legal rules. It is important to reflect on selecting China's national security review of foreign direct investment legislation mode by research existing legislative style national security review in the world, to combine the status quo of our national security review of legislation. Also it focus on the legal rules of FDI national security review in both China and US, respectively by comparing and analyzing two countries "scope of review" clause, "review content" clause and "review structure" clause, then to reflect on the system design issues of the national security review, and provides that improvement recommendations for China's existing foreign investment of national security review of legislation: to erect the special law, to make sure of the scope of the review, to set carefully review security factors; to improve oversight review recommendations.

Key words: foreign direct investment, national security, safety factors, national security review, legal rules

Introduction

Introduction: China was listed as the prospectively best source country of investment in the World Investment Report of 2015, 2016 and 2017.^[2] Utilization of foreign investment is still a basic policy of China; however, inbound investment will inevitably bring about risks of politic, economy, law and national security, which makes legislation about national security review and its reform important. In 2015, Ministry of Commerce of PRC promulgated Foreign Investment Law (Draft), and the government of Shanghai introduced The Measures for the Pilot Program of National Security Review of Foreign Investment in Pilot Free Trade Zones. The above measures have significant influence on the design and establishment of FDI national security review rules in China. These legislations tie closely with recent results of academic research in China.^[3]

Based on the above researches, the following aspects were selected as the focus of this research. The first one is to compare existing relevant legislation with three pillar provisions in typical national security review systems, aimed at improving the design of national security review system from the perspective of legal provisions. The second one is to recommend the expansion of the scope of national security review, which means

to clarify the scope of national security review, including both foreign merger and greenfield investment. The third one is to discuss the traditional provision that national security review "is exempted from administrative review and judicial review", suggesting that judicial review be added in national security review system.

1. Legislative model of China FDI national security review and the comment

1.1 Analysis of legislative model of FDI national security review in China

Legislative model means the model of legislation. The extension of legislative model is relatively wide. Legislative model *sensu lato* includes legislative body, legislative power, legislative procedure, legislative content, legislative value and some other series factors. There is no consensus on the definition of legislative model among the academic world. Many scholars established their understandings about legislative model indirectly when studying the legislative model of one particular law.^[4] Other scholars hold the idea that legislative model is the typical pattern, basic mind-set, specific procedure and the legislative system and rules decided by many factors when promulgating, amending and abolishing a law.^[5] Some scholars

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opined that legislative model includes goal model,^[6] body model and system model. Here, it refers particularly to body model and system model.

The legal basis for FDI national security review in China is Notice of the General Office of the State Council on the Establishment of the Security Review System for Mergers and Acquisitions of Domestic Enterprises by Foreign Investors (Security Review Notice), Provisions of the Ministry of Commerce on Implementing a Security Review System for Mergers and Acquisitions of Domestic Enterprises by Foreign Investors (Security Review Provisions) and Measures for the Pilot Program of National Security Review of Foreign Investment in Pilot Free Trade Zones (Measures for the Pilot Program) newly introduced in 2015. As of now, there is no special or comprehensive legislation for national security review in China. Chapter 4 of Draft of Foreign Investment Law (Draft) introduced by Ministry of Commerce in early 2015 specially regulates foreign investment national security review system, which explores the legislative model for a comprehensive FDI national security review system in China.

1.2 Analysis of features of legislative model for FDI national security review legislation in China

1.2.1 The legislative model for the Draft is a comprehensive one

The features are as follows. The first one is that it is a statutory law, which typically appears in Canada and Australia. Canada is the first country which regulates foreign investment review using statutory law, and it promulgated Foreign Investment Review Act (FIRA) and Investment Canada Act (ICA) in 1973 and 1985 respectively to regulate foreign investment legally. In 2005, Amendment for ICA was introduced, marking the establishment of national security review regime in Canada. In 2009, Canada Parliament introduced National Security Review of Investments Regulations (NSRIR). The Amendment and NSRIR collectively provide the legal basis for detailed contents to be reviewed.^[7] Australia promulgated Foreign Acquisitions and Takeovers Act (FATA) and Foreign Acquisitions and Takeovers Regulations respectively in 1975 and 1989. In 2010, Australia amended FATA and its implementing regulation.^[8] The current Draft in China is also a statutory law. The second one is that the Draft is an overall institutional arrangement. The third one is that the rules of security review are reflected in Foreign Investment Law, or a chapter or some provisions of it, accompanied by an implementing regulation. As for China, the rules of security review are listed in Chapter of the Draft, from Article 48 to Article 74.^[9] The fourth is that the comprehensive model has some defects. For examples, the form of the legislation is limited, and the capacity of the legislation cannot satisfy the need for a complex and vital law handling national security review. That is because the substantial contents of a national security review

legislation cover the reviewing facility; reviewed contents including reviewed investments and reviewed investors; the conception of national security, national interests, national public policy and related rules; accountability system for national security review;^[10] related procedure and enforcement of law; related institutions and the relationships between them; the validity of law the relationship with other related legislations; coming into force of the legislation.^[11] It seems cramped if the above contents are squeezed into one chapter or few provisions, causing difficulty for the readiness of the substantial rules. The form of special legislation can avoid above defects and the contents of such legislation will be clearer, more precise and more comprehensive.

1.2.2 Borrowing from special legislation model and the analysis of the approaches

Based on the above analysis of the comprehensive legislative model, this study opines that the defects can be avoided by borrowing from the special legislative model. America is a typical example adopting special legislative model. It's worthy of researching the experience, features and approached of security review legislation in America. Firstly, the special legislation for national security review in American went through consistent amendments, which made it become precise, improved and practicable gradually. During countless amendments, the legal loopholes were filled.^[12] Until 2007, the President of America Bush introduced the Foreign Investment and National Security Act (FINSA), which amended section 721 of the Defense Production Act, strengthening and improving the national security review system in foreign merger. The improvement covers six aspects: codification and standardization of the working mode during practice; focus on the political issues in cases; add factors to be considered when reviewing cases; build re-review system; strengthen the involvement of Congress; clarify the function and power of high rank government officials.^[13] Obviously, FINSA was improved based on the national security review rules which have been in existence for more than thirty years, thus, it is perfected and practicable. Consequently, it is worth being borrowed by China.

Secondly, the operability of the FDI national security review rules in America is worth being borrowed to regularize existing effective measures. For examples, the Mitigation Agreement signed by parties of a transaction and competent authority in related industry has become regulation. The status of national intelligence department is also regulated. It is also clearly stipulated that the scope of monitoring and review are merger cases relating to national security, while the most important definition of "national security" is described from eleven aspects, with certain vagueness out of necessity.^[14]

Thirdly, the rigorous feature of the special legislation in America is worth being borrowed. For example, the system of re-review, which means that if any party to the transaction

submitted false or misleading material information, or omitted material information, the previously reviewed transaction will be reviewed again.^[15]

Fourthly, the compatibility of special legislation in America is worth being borrowed, which means the compatibility between the function and power of different facilities and officials involved in the review. For example, the system of Lead Agency in FINSA stipulates that the Secretary of the Treasury shall designate, as appropriate, a member or members of the Committee on Foreign Investment to be the lead agency or agencies on behalf of the Committee in charge of the negotiation, adjustment, monitoring and enforcement of the mitigation agreement, providing periodic reports to the Committee and providing report to the Director of National Intelligence, Attorney General and other departments having material relationship with specific cases. This system involves functions of many departments and the compatibility between them, which is exactly what can be borrowed by the review system in China. Meanwhile, the function and status of the national intelligence department in the Committee on Foreign Investment is clarified.^[16]

2. Analysis of some major legal issues of FDI national security review regime in China

2.1 The scope of security review need to be further clarified

The vague scope of security review will do harm to national security review regime. Although the factors being reviewed in national security review regime is improved in the Draft,^[17] the scope of review in current regulations in force need clarifying, the reason for which is that the determination of the scope relies on the definition of "foreign investment", and "controlling power", a well-recognized reference shall be taken into account when defining "foreign investment". Nevertheless, there is no clear provision in current regulations in force.

2.1.1 There is controversy about the extension of "foreign investment"

The controversy is reflected from two aspects. The first one is the extension of "foreign investment" in current regulations,^[18] and the second one is that the security review for "greenfield investment" in newly introduced Draft is not clear enough,^[19] which is disadvantageous for the enforcement of the national security review legislation.

As to the first aspect, the definition of foreign investment in current national security review legislations is not comprehensive enough. In Security Review Notice, the scope of review is limited to merger and acquisition,^[20] and greenfield investment is not covered. The Measures for the Pilot Program is limited to investments in free trade zone, including new projects or formation of enterprises, merger and investment through agreement-based control, holding shares for others, trust,

reinvestment and other means. This definition expands the concept of foreign investment from foreign merger to foreign direct investments. The Draft stipulates seven factors to be examined,^[21] and "foreign investment" is defined directly.^[22] These provisions will change previous security review system in China, but consensus has yet been formed. For examples, the definition of the seven factors reviewed shall be stipulated, otherwise, the practicability and effectiveness of security review will be influenced. Moreover, the scope of review need deeper considering.^[23] By contrast, the content reviewed under national security review in America is "covered transaction",^[24] which means any merger, acquisition, or takeover that is proposed or pending after August 23, 1988, by or with any foreign person which could result in foreign control of any person engaged in interstate commerce in the United States. The definition of "covered transaction" clarifies types of foreign investment, which are acquisition of the shareholder's equity, acquisition of voting assets or proxy voting right, merger and establishment of joint venture.^[25] Obviously, the scope of "covered transaction" in America is wider than "foreign investment" and seven factors in the Draft in China. A wide definition ensures strict foreign investment review in America and avoids loopholes, resulting in a foreign investment security review system which is worthy of the name. Thus, borrowing this key provision in the Draft is worth considering. It is noteworthy that Article 15 of the Draft stipulates that "Foreign investment under this law means any of the following investment activities directly or indirectly engaged in by a foreign investor", while there is no direct definition of "foreign investment" in FINSA. However, in US Model BIT 2012, "investment" is clearly defined as every asset that an investor owns or controls, directly or indirectly, that has the characteristics of an investment, which is similar to the definition in Chapter 9 of TPP.^[26] China defines "investment" as "activity", while America defines it as "asset", let alone differences in detailed categories.^[27] Compared with each other, "activity" and "asset" differ hugely. "Activity" usually refers to an action aimed at certain goal, which "asset" refers to resources capable of generating economic benefits controlled by an entity (enterprise, natural person, organization or state). Different definitions can cause divergence during enforcement easily. Consequently, there should be a more precise definition for "investment" in the draft.

2.1.2 The definition of controlling power is not scientific

The "controlling" in current national security review legislations is not scientific because of following reasons. First, the determination of controlling power in Security Review Notice is far more simple by using the criteria of 50% stock. It is also true for Measures for the Pilot Program that the determination of controlling power is judged by 50% stock plus parameters such as decision-making, human and financial affairs. Despite the above facts, the scope of review is different in

Security Review Notice and Measures for the Pilot Program, from traditional “enterprises whose actual controlling power may be obtained by foreign investors” in Security Review Notice to “foreign investors obtain the actual controlling power of the enterprises they invest in” in Measures for the Pilot Program, meaning that the threshold for security review becomes higher and the number of transactions to be reviewed is reduced to some extent. Meanwhile, the limited discretion makes the operation of the procedure more effective and convincing. Second, compared to the design of the elements of “control” in foreign national security review regime, related legislations in China do not emphasize and define elements of “control”.^[28] The term control means the power, direct or indirect, whether or not exercised, through the ownership of a majority or a dominant minority of the total outstanding voting interest in an entity, board representation, proxy voting, a special share, contractual arrangements, formal or informal arrangements to act in concert, or other means, to determine, direct, or decide important matters affecting an entity; in particular, but without limitation, to determine, direct, take, reach, or cause decisions regarding the following matters, or any other similarly important matters affecting an entity: (1)... (2)... (3)... Apart from that definition, situations where more than one foreign person has an ownership interest in an entity constitutes “control” and where minority shareholder protections shall not in themselves be deemed to confer control over an entity is clearly stipulated, which is precise and strict. In newly amended FATA in Australia, substantial interest in a corporation is newly defined.^[29] The person, alone or together with any associate or associates of the person is in a position to control not less than 15% of the voting power in the corporation will be deemed as substantial interest. Moreover, substantial interest can be added cumulatively if two or more persons, together with any associate or associates of any of them, are in a position to control not less than 40% of the voting power or issued shares in the corporation. In 2008, Germany passed the 13th Amendment of Foreign Economic Law and Foreign Economic Regulation, stipulating that where investment projects, no matter from EU or non-EU members, are to acquire more than 25% of stocks in Germany enterprises will be under review.^[30] In 2008, Russia promulgated Procedure for Foreign Investments in Companies of Strategic Significance for the Defense and Security of the State, which stipulates that ownership by foreign merger of more than 50% of the voting shares in a Strategic Company should be approved by Foreign Investment Committee led by the Premier. Foreign state-owned enterprise which is to acquire more than 25% of the stocks of the above companies shall also be approved by the Committee.^[31]

To sum up, through the analysis of the elements of “control” in security review legislations both in China and abroad, the following conclusions can be reached. To start with, the requirement for portion of foreign shares to constitute

controlling power differs from country to country. Meanwhile, percentage of shares is not the only factor, and other factors of factual control shall be taken into consideration, which is without any doubt. What is worth considering for security review legislators in China is the specific percentage and how to set that percentage. Moreover, the key word “control” is clearly defined in legislations around the world. As the focus of review, elements of control, as well as contents of which, shall be clearly defined in legislation. Such clear definition is worth borrowing because it can make the legislation more operational in practice, more convenient for investors as a guidance, and more scientific as to avoid controversy caused by vague definition. Before the introduction of the Draft, there is no such legislative technic in China, which is worth applying in future legislation practice. Besides, the elements of control in national security review regime in China should be deeply considered and nicely designed.

2.2 The standard for security review is uncertain

The standard for review is the substance of FDI national security review regime, including principal standard and specific principle. The principal standard for national security review is whether the investment will jeopardize national security. As a result, the definition of “national security” is the key to the standard. The specific standard of national security review is judged on the bases of “factors reviewed”.

2.2.1 The vagueness of the definition of national security

Traditionally, national security was associated with national defense security; however, from the perspective of the development of international practice, this interpretation is no longer appropriate. The publications of UNCTAD pointed out that the Oxford English Dictionary defines national security as the security of a country and its people and facility, and, especially, it is protected from the impact of military threat, spies and terrorism. Since the security of the country and its people is the core of this definition, the threat to people’s health and environment, as well as the threat to general political, economic, financial system and domestic infrastructure and culture shall be included.^[32] The definition of national security in the context of foreign investment should be different from its general meaning, with a wider scope.

Currently, there is no precise definition of “national security” in international or domestic practice.^[33] In FINSA, national security is defined as “to include those issues relating to ‘homeland security’, including its application to critical infrastructure”,^[34] which is obviously general. In the Draft, similar provisions are simply vanished, with seven factors to be reviewed.^[35] Such kind of intentional vagueness of the definition is a legislative technic in order to maintain more flexible discretion towards this issue, the reason for which is that a state demand both inbound investment and a safe country. The attraction of foreign investment can boost new industry, realizing

the effect of resource transfer called “change market for technology” which can push the growth of GDP. On the other hand, large utilization of foreign investment will cause deviation of economy development mode, resulting in monopoly. This will cause disadvantageous influence on domestic competition and severe waste of domestic resources, impeding sustainable development.^[36] Even worse, it will constitute potential threat to national security. As a result, governments try to give consideration to both aspects and find a balance point between them. However, it is a challenge to take advantage of such flexibility and find better balance in this field of law. Undoubtedly, intentional vagueness of the definition of national security is beneficial to a state, there is something more which need considering, such as posing a general definition of national security, while distinguishing it with the definition of national interests, national economy security and public interests in order to avoid impeding or burdening foreign investment.^[37]

2.2.2 “Factors reviewed” are not comprehensive

Due to the vagueness of the definition of “national security”, the legislative design of “factors reviewed” becomes important; however, the factors reviewed in currently national security legislation in China are not comprehensive.

In Security Review Notice, the factors reviewed include national defense security, national economy security, social order security and capacity of research and development (R&D) of key technologies, among which national defense security includes production capacity of domestic products, provision capacity of domestic services, and relevant equipment and facilities that are required by national defense.^[38] The factors reviewed in Measures for the Pilot Program include national defense security, national economy security, social order security, culture security, public morality security, cyber security and capacity of R&D of key technology.^[39]

From Security Review Notice to Measures for the Pilot Program, the national security review legislations added culture security, public morality, cyber security in to consideration, reflecting requirements of national security review in new era. Culture security refers to security relating to mental state, including knowledge, experience, technology, personality, sense of value and moral standards.^[40] In international trade, much attention is paid on culture, forming the principle of “l'exception culturelle”, which shall also be included in the field of foreign investment. The absorption of culture security into the rules reflects this requirement. Public morality security also draws much attention. In Gambling and Betting case, the American panel made an interpretation of public morality: it refers to standard of right and wrong maintained or represented by a society or country, and it relates to the maintenance of fundamental interests of society reflected by public policy and law.^[41] Consequently, it is undoubted that culture security is important, especially for a country like China with moral

tradition where the design of public morality security consideration meets the requirement of the current situation. As to cyber security, it refers to measures adopted to protect cyber infrastructure, maintain safe communication and defend cyber-attack.^[42] With the popularity of internet, cases relating to national security began to appear,^[43] resulting in more intention drawn on it. Due to the swift and irreversible feature of internet, the convenience brought about to cross-border transaction as accompanied by irreparable errors. Even worse, financial crimes through internet jeopardize national economy security. Under such circumstance, the reform of national security review legislation in China must take cyber security into consideration. This is not only the advanced experience abroad, but a step of reform and opening-up policy.

As regard to security review legislations in China, they follow the trends while maintaining special characteristics; however, compared to developed countries, there are some defects.

For example, the factors reviewed in national security review legislation of America are designed comprehensively. With the forward of time and the accumulation of experience, they became perfected. Firstly, defense industry is top priority among factors reviewed. The Exon-Florio Amendment listed three factors to be reviewed relating to national security.^[44] The first one is the control of domestic industries and commercial activity by foreign citizens as it affects the capability and capacity of the United States to meet the requirements of national security. The second one is the potential national security-related effects on United States critical industries, such as telegram and transportation. The third one is national security-related effects on other industries and services, such as financial system. The third factor is a general miscellaneous provision, blocking any transaction that may threat national security. Because two of the three factors are related to defense, it can be seen that the focus of this amendment is the influence of foreign merger on defense industry.

Secondly, weapons are listed into factors reviewed.^[45] Byrd Amendment added two factors reviewed. The first one is the potential effects of the proposed or pending transaction on sales of military goods, equipment, or technology to any country that supports terrorism or holds destructive weapons. The second one is whether the merger involves third party. In the end, general factors such as strategic assets are included to make the national security review stricter. For example, FINSAs added five factors, focusing on strategic assets, governmental influence and practicable discretion. Strategic assets include critical infrastructure, critical technology, critical energy and critical material. Governmental influence refers to whether the policy of the foreign government is compatible to America as to counter terrorism and nuclear, chemical and biological weapons. The discretion means that a transaction can be terminated by

President or the Committee for other factors as they may determine to be appropriate. What is noteworthy is the new tendency of American legislation, which is Foreign Investment Risk Review Modernization Act of 2017 (FIRRMA). The new Act would modernize the CFIUS review and approval process, which has struggled to keep pace with a surge of foreign investment in the United States over the last several years. If passed, the bill would revamp the CFIUS review process and update the regulations to address the national security concerns implicated in the transfer of sensitive U.S. technology to countries of "special concern," most notably China. FIRRMA would also expand the Committee's mandate to include certain joint ventures, minority position investments and real estate transactions near military bases or other sensitive government facilities. Once the Act is passed, the changes mentioned above will generate important influence on foreign investors seeking to invest in America and American tech companies seeking outbound investment.^[46]

It can be seen that there are 11 factors reviewed in American national security legislation, adopting the method of listing and miscellaneous provision, and the newly promulgated security review legislation will make the standards for review more specific and comprehensive.

The design of factors reviewed in the Draft is the highlight of national security review regime reform, and the related provisions are ahead of the world. For example, Article 57 of the Draft listed 11 factors reviewed, including national defending security, research and development capabilities for key technologies, critical infrastructures, dual use products that are subject to import or export control, information and internet security, energy and critical resources security, stable operation of national economy, public interest and public order, and whether the foreign investment is controlled by a foreign government, accompanied by "other factors that the Joint Committee believes must be considered" as a miscellaneous provision.^[47] This article shows that not all transactions relating to national security, but those under the coverage of factors reviewed will be subject to national security review, which makes national security review more effective. Meanwhile, it is clear enough for the investors whether a certain transaction should be applied for national security review. This article is also flexible, and the design of miscellaneous provision leaves security practice with enough space for discretion, making the scope of national security more comprehensive.

However, some scholars doubted Article 57^[48] that some of the 11 factors may not be related to national security, and exceeding factors may increase the number of security review cases. Nowadays, the connotation of national security is not limited to national defense security. Excluding politics, this conception covers economy, culture, society and ecology. As the last and the most important base line, the factors shall be

designed comprehensively as a preventive action. It is better to adopt additional factors than leaving obvious loopholes. Apart from traditional defense, energy and technology, the involvement of public interests and public order is the result of the consistent emphasis on morality in China, while the involvement of information and internet followed international trend.

There are also some defects in the design of the factors reviewed. For example, security in fields like human right, ecology, culture and food ties closely to human life now, but they have yet been taken into consideration. Compared to those in America, the factors reviewed in China are improved, with epochal feature and their own characteristics such as the consideration of culture and morality. However, the defect is that with the international trend of counter terrorism, related factors have yet been listed into the legislations in China, while in America, whether the source country supports terrorism or maintains destructive weapons is taken into consideration to eliminate potential unsecure threat.

2.2.3 The reviewing body is not reasonable

The scope and the contents of security review are regulated in the substantive law of national security review. After the related regulations are appropriately arranged, the national security regime can operate effectively. Among the procedural regulations, the institutional arrangement is a critical part. The unreasonable arrangement of reviewing bodies and the incompatible relationship between them are defects in national security review regime in China.

a. The current arrangement of the reviewing body in China is unreasonable

The Security Review Notice provides that An Inter-Ministerial Panel on Security Review on M&A of Domestic Enterprises by Foreign Investors (the "Inter-Ministerial Panel") will be established to undertake the work of M&A security review. The Inter-Ministerial Panel, led by the National Development and Reform Commission and Ministry of Commerce under the leadership of the State Council, will work with relevant government agencies to carry out M&A security review, in accordance with industries and sectors where the foreign investors' M&A takes place. The main responsibilities of the Inter-Ministerial Panel are as follows: analyzing the impact of foreign investors' M&A of domestic enterprises on national security; studying and coordinating key issue in the security review of foreign investors M&A of domestic enterprises that are subject to security review; conduct security review of M&A covered by this Circular and make decision.^[49] The reviewing body remains unchanged in the new legislation reform, and the current mechanism is Inter-Ministerial Panel.^[50] The advantages of this arrangement is that the reviews are more professional and they can meet the requirement of expanded scope of review; however, the body in

charge is unclear, and the functions and power is difficult to be performed. Comparatively, FINSA clearly authorizes CFIUS with the power to carry out national security review.^[51] As to the constitution of Committee, FINSA created Lead Agency mechanism and the President and Treasury is free to add new members. In China, the Panel is led by National Development and Reform Commission and Ministry of Commerce, which will cause confused responsibility and power between two departments. Due to closer relationship between management of foreign investment and the function of MOC and more experience MOC has to this regard, it is more appropriate if the power of conducting security review is authorized to MOC. It can also avoid the waste of administrative resources. Consequently, the reviewing body shall be clearly designated in new legislation.^[52]

b. The regulation of "relevant agencies" in security review legislation in China is vague

The definition of "relevant agencies" is not clarified in implementing regulations, and only general principle is provided, which is "in accordance with industries and sectors where the foreign investors' M&A takes place". Such provision not only influences the effect of security review, but also makes it difficult to fulfill responsibilities. More importantly, the goal of national security review is jeopardized. As a result, the innovating method of America is worth borrowing. FINSA and its implementing regulation clarifies the reviewing body and coordination of functions between government agencies. As to the composing departments of CFIUS, they can be divided into four categories based on their position and function. The first category is the departments in favor of utilizing foreign investments, including Department of the Treasury, Department of Commerce, Department of State, Office of the United States Trade Representative, Office of Management and Budget, Council of Economic Advisers and National Economic Council. The second category is the departments which take national security as top priority, including Department of Homeland Security, Department of Defense, Department of Justice, National Security Council and Office of Homeland Security and Counterterrorism. The third category is the department which holds neutral position, including Office of Science and Technology Policy. The fourth category is the departments which hold neutral position and hold no voting right, including Department of Labor and Office of the Director of National Intelligence.^[53] At the beginning of the establishment of the Committee, the reviewing bodies had been arranged. The design of reviewing body was improved till the introduction of FINSA and its implementing regulation. The expansion and improvement of the composing agencies show different policies towards foreign investments in different times, as well as the process where the power of the Committee became strong from weak, and limited again. All in all, the reviewing bodies of

national security review regime in America as well as the responsibilities of which are clear regulated, resulting in a high-level security review function. It is common in international practice that the foreign investment national security review is carried out by multiple government agencies to ensure a scientific and reasonable review.

As a result, "relevant agencies" should be directly clarified in new legislations by, for example, listing Ministry of National Defense, Ministry of State Security, National Development and Reform Commission, Ministry of Foreign Affairs, State-owned Assets Supervision and Administration Commission, Ministry of Justice, Ministry of Agriculture and Ministry of Science and Technology into relevant agencies. Lastly, taking into consideration of the importance of national security review and the wide scope of review, relevant agencies can be designated openly, providing that the State Council is entitled to involve other agencies as reviewing body of certain transaction temporarily to meet the actual need of security review.

3. Suggestions for improving FDI national security review legislations in China

3.1 Legislate special law for national security review

3.1.1 Special legislation can meet the requirement of security review regime under new situation

As stated before, the legislation for national security review was introduced late, such as Provisions of the Ministry of Commerce on M&A of a Domestic Enterprise by Foreign Investors (Order 10) and Provisions of the Ministry of Commerce on M&A of a Domestic Enterprise by Foreign Investors (Order 6) promulgated respectively in 2006 and 2009. In February 2011, Notice of the General Office of the State Council on the Establishment of the Security Review System for Mergers and Acquisitions of Domestic Enterprises by Foreign Investors was introduced, which established foreign investment national security review regime in China. Afterwards, in 2011, Provisions of the Ministry of Commerce on Implementing a Security Review System for Mergers and Acquisitions of Domestic Enterprises by Foreign Investors was introduced by MOC. On 19 January 2015, Foreign Investment Law of PRC (Draft) was publicized by MOC. This process shows the transformation of national security review regime from policy to law. At the beginning, the legislation was mainly borrowed from relevant law in America. It reduced the difficulty for legislation, while such legislation is relatively distant from domestic practice in China. Nowadays, the background of national security review legislation is different, and the time has come to replace passive reform with special legislation that is internationalized and well-planned. Moreover, special legislation is beneficial for a clear and operational security review system.

3.1.1 National security review legislation shall enjoy high hierarchy of legal validity

Taking the current situation of legislation, new background of legislation and the trend of reform into consideration, the field of foreign investment national security review need special legislation, such as Foreign Investment National Security Review Law in the form of Anti-Monopoly Law. The reasons are as follows. First, foreign investment national security review legislation, as a special review regime relating to national security, bears arduous responsibility under the background of the reform of foreign investment management. As a result, authority is an inevitable requirement for national security review to fulfill its function as the last base line. Looking at previous and current legislations in China, the form of administrative rules as the basis of review for foreign investment accession, which is a sort of administrative licensing, is problematic as regard to its legality. Even though it is legal, a regulation with low hierarchy of legal validity will cause problems in practice, and it is hard to follow the international trend. This issue has already drawn attention in the reform of foreign investment management, and solutions have come out in the Draft. The situation has been changed, but there is still room for improvement.

Secondly, the system of security review involves many critical government agencies and complex contents including scope of review, contents of review and procedure of review. It further need detailed instructions, which makes it a better option to be legislated separately.

Lastly, the foreign investment national security review regime intersects with Foreign Investment Law and National Security Law. Article 59 of National Security Law implemented on 1 July 2015 provided national security review,^[54] showing that foreign investment national security review is a part of national security. National security review is also provided in the Draft, which shows that national security review is critical in foreign investment law. Due to the complexity caused by the intersection, special legislation is a better option. In that way, for the purpose of the uniformity of legal system, brief instructions can be provided in relevant law, and detailed regulations are provided in this special legislation.

3.2 Clarify the scope of national security review

3.2.1 The scope of national security review should be expanded

The national security review system should be applied to greenfield investment, a form of investment by which a foreign enterprise can invest directly in the host state to set up new factories, which is frequently used in investment. As the only standard for national security review is whether certain investment may jeopardize national security, this kind of investment should be subject to relevant legislation. Moreover, “foreign investment” is not clearly defined in Chapter 4 of the Draft. According to the method of systematic interpretation, the definition of “foreign investment” is the same as that in Article

15, Chapter 2, which means that foreign indirect investment should be subject to national security review. Foreign indirect investment refers to investment made through profitable stocks and securities.^[55] During the whole process of investment, the investor does not take part in the management of the enterprise and does not control the target enterprise. There are divergent forms of foreign indirect investment, such as buying stocks of listed companies in securities market and buying corporate bonds to acquire dividend or interests. As a result, the substantial difference between foreign direct and indirect investment is whether the investor can control the target enterprise.^[56] However, elements of control is critical in determining scope of review. Consequently, it is the opinion in this study that national security review is not applied to foreign indirect investment. As to the Draft, an exception provision shall be added in Chapter 4 to exclude foreign indirect investment. If special legislation is promulgated in the future, foreign investment can be defined to limit the conception in foreign direct investment.

3.2.2 Scientific design of elements of control

First, it is not scientific to set a single percentage of ownership, because control cannot be divided from foreign investment. As foreign investments are of different forms, subjects and objects, it is not scientific to apply the standard of 50% ownership to investments in every industrial sector without distinction. For example, special attention is put on critical technology and critical infrastructure, and Russia designated 42 industries in 7 sectors as strategic industry. China, without exception, maintains Catalogue of Industries for Guiding Foreign Investment. As a result, stepwise percentage requirement can be set in accordance of different importance of target industries. Obviously, this method is inspired by the design of Russia, which distinguish enterprises controlled by foreign governments from general investors, adopting standards of 25% and 50% respectively. As investments controlled by foreign governments are also focus of national security legislation in China, the method of Russia is worth being borrowed. Moreover, China has categorized domestic industries by Catalogue of Industries for Guiding Foreign Investment, so it is convenient to associate the catalogue with the percentage of ownership. The method of cumulative percentage of Australia is also worth being borrowed, which is the same as the method of judging dominant market position in Anti-Monopoly Law in China.

3.2.3 Define the key words of legislation

Through the analysis of the provision of “scope of review” and “contents of review”, it is obviously shown that the main legislative technic of determining the target and standards of national security review if to define key words. This study mainly analyzed the legal definitions of “foreign investment”, “control”, “national security” and “factors reviewed” in different countries to analyze the similarities and differences of the scope

and contents of security review in those countries.

Through the analysis of these definitions, it is shown that, firstly, in the field of foreign investment national security review, the legal connotation and extension of some words have changed comparing to their common meaning. For example, the extension of "foreign investment" is narrowed down. The connotation of some words has also changed over time. For example, the connotation of "national security" has expanded. Moreover, a word may be defined differently by different states, and foreign investment will inevitably involve both domestic and foreign subjects and legislations. For the purpose of avoiding security review controversies caused by different understandings of words, it is necessary to define key words clearly. If certain words, such as "national security", cannot be defined, the scope or standards used to examine them should be clarified. For example, factors reviewed is the standard of judging "national security". The method of defining key words in the Draft shows the improvement of legislative technique in China.

What's more, the methods of making definition are different, among which the method of summarization plus listing is the most common one. The legislation in America emphasizes definition, which are always a separate section named as "definition". Moreover, the definition in American legislation is the most comprehensive one, including not only summarization and listing, but also detailed examples and analysis. This study opined that in the future implementing regulation of national security review, this method can be borrowed to define complex legal conception, but it is not appropriate in the Draft or special National Security Law.

Lastly, one indispensable method of making definition is "reverse definition". Where the extension of a definition is too extensive to be listed, the method of excluding can be adopted, which means to list the circumstances which are not covered by the definition such as a "negative list". Article 5 of the newest FATA of Australia, the relative conceptions of foreign acquisitions and takeovers are defined through this method. The method of excluding is adopted by the Amendment to conduct the review, listing two circumstances where FATA does not apply. The first one is acquisition by will or by devolution by operation of law, and the second one is acquisition by way of enforcement of a security held solely for the purposes of a moneylending agreement.^[57]

3.3 The "factors reviewed" shall be designed deliberately

Currently, there is no clear definition of national security domestically or abroad. In the practices of legislation in different countries, this phrase is given vague definition. However, factors reviewed are put in place not only because national security associates with fundamental national interests, but for the convenience for practice of national security review. America government designed 11 factors, the feature of which is that they

focus more on national defense and economy security, and economy security has drawn increasingly more attention. The factors reviewed in FDI national security review regime in China are inspired by the experience of America, but they are also designed in accordance with the new international trend. It has improved comparing to previous legislation, but there is still room for perfection.

3.3.1 Attention shall be paid to the investments controlled by foreign governments

The Byrd Amendment added compulsory review,^[58] paying much attention to investments controlled by foreign governments. As long as the foreign investor is an enterprise controlled by or representing the interests of its government, such transaction must be subject to national security review.

The M&A of Chinese companies were blocked consistently in recent years, one of the reasons for which is that the CFIUS thought that the investors were controlled by Chinese government, threatening the national security of America. For examples, the acquisition of Unocal by CNOOC^[59] and the acquisition of 3COM by Huawei. The reason why these transactions were blocked by American government is that, according to the legislation of America, foreign government control is one of the factors reviewed. For China, apart from considering active reform of state-owned enterprises, countermeasure by method of law is a roundabout method to relieve the dilemma. As a result, investments controlled by foreign governments shall be taken into factors reviewed. This is covered by the Draft, but it is not covered in currently effective legislation.

3.3.2 Ecological security, human right and environment should be taken into consideration

Peace and development are main themes now; however, a lot of energy and resources are consumed along with the boosting speed of economy development, causing severe environment pollution and threats toward sustainable development. Issues of ecological environment are popular in recent years. Developed countries build their factories in developing countries to avoid pollution to their own. There are two ways of reducing the cost of investments for the fast development of source country. The first one is the convenient utilization of cheap labor and energy, and the second one is the transfer of ecological burden. As a result, while carrying out the domestic reform of economic development model and industrial transformation, ecological security should be covered by the scope of national security review, which means that investments jeopardizing ecological environment shall be prohibited.

Apart from that, the considerations of human right and environment are inevitable in foreign investment national security review. In the field of foreign investment, human right is reflected as follows. The first one is the protection of the right of workers. Foreign investment should guarantee fundamental

constitutional rights such as human dignity, right to rest and right to salaries. In practice, the phenomenon of insulting workers happens a lot, which can be avoided by taking human right into consideration of security review, and it is the obligation of the source country to protect the rights of its own workers. The second one is that the investor cannot violate the requirements of human right, including ethics and morality. Circumstances like human cloning and terrorism shall be prohibited.

The design of factors reviewed covering above two issued will be ahead of the world. Even the Draft and the Measures for the Pilot Program reflecting the results of the reform did not take them into consideration. They only contain advanced factors such as cyber security and culture security.

3.3.3 Miscellaneous provision should be contained in the contents of review

Borrowing from the legislation in America, the Draft added miscellaneous provision, which expands the scope of review and increases the flexibility of the review. The significances of these provisions have been mentioned in detail before. Because it is not included in current legislations, it is emphasized here.

3.4 The supervision mechanism shall be improved

The design of FDI national security review regime involves three aspects of allocation of power.^[60] Apart from the inner division of the reviewing body, the balance and restriction between the power of legislation body, judicial body and administrative body influence the function of the review directly, even the development of the legislation. Although the template of the security review rules is legislation in America, the arrangement of the reviewing body is not scientific enough. The supervision of review shall be strengthened, including legislation supervision and judicial review.

3.4.1 The supervision function of the NPC and its standing committee shall be expanded

It is a well-recognized rule of power that absolute power leads to absolute corruption. As a result, in the field of national security review system, the mechanism for power restriction is designed. In America, it is the supervision from the Congress, while in Russia, it is judicial review. The existence of the outward supervision can not only ensure law-based administration but also expand the discretion for national security. That is to say, the significance of supervision is not to prevent the administrative body from being exceedingly strict, but from exceedingly loose, which may influence national security. In this regard, the supervision of Congress in America can be borrowed. The US Congress requests that the CFIUS make a report at the end of every national security review case, as well as confidential brief report and annual report.^[61] It is under such strict supervision that the merger of Unocal by CNOOC was blocked. The current national security review rules in China lack supervision mechanism. Due to the critical importance of national security, the supervision function of the

NPC shall be expanded. An analysis of the foreign investment national security review cases shall be included in Government Work Report of last year reported to NPC. While the NPC is adjourned, every review case shall be reported to its standing committee, which forms a perfect network for national security.

3.4.2 The judicial review of foreign investment national security review

The purpose of expanding supervision for legislation is to maintain national security. While implementing the above reform, the principle of system balance should be born in mind. If there is nothing but the rules for protecting national security, the confidence of investors will be shaken, and negative influence may be brought on utilization of foreign investment. However, the utilization of foreign investment is always a highly advocated economic policy. This study opined that the remedy of judicial review can reduce investors' concerns. Traditional national review legislations, both in China and America, insisted on the exemption of judicial review. However, during the introspection of the problems in national security review regime in America by foreign scholars, the remedy of judicial review has become a major dispute. In America, the issue of judicial review in national security review was ignored, because the clear legislations are undoubted. However, this situation has begun to change after 2012. In *Ralls Corp. v. CFIUS* case,^[62] Chinese company defended justice by way of law and set a precedent. This case was settled now, but the research on the justiciability of security review continues. There are countries where judicial review is a part of national security review, typically Russia. If the application made by investor is not reviewed, or a transaction is denied by the Foreign Investment Committee, investor can appeal to courts. The original intention of the exemption of security review from judicial review is to maintain national security; however, it failed to strike a balance, and it is opposite to the original idea of security review. It is possible that at the beginning of the security review system, more attention was paid to national security, because the reason why this system was designed is to eliminate factors threatening national security. However, with the development of this system, balance seems more important, especially under the background that security review may be politized. To achieve fairness and equity and attract foreign investors, we should add judicial review of security review. The provision of "exemption from administrative review and administrative law suit" should stop to exist. Moreover, the remedy of judicial review for national security review shall be specially provided, and the jurisdiction and procedure of such cases shall be clarified.

3.5 Conclusion

China, as a developing country, is a major destination for capital and also a major source for capital. It is an absolute option currently and in the future, to utilize foreign investment and attract advanced technologies and management experience

for the development of domestic economic development. In order to avoid possible damages to sovereignty and economy security caused by inbound investment, sophisticated FDI national security review system shall be established in China. This study starts with the selection of legislative styles, and states that there are abundant contents, many rules and complex agencies in this legislation. This study also pointed out the defects in current legislation and possible breakthrough in legislations relating to foreign investment. Suggestions are made in this study as regards to aspects that can be further improved, which is to borrow experience from America and other countries along with the considering of the requirements of foreign investment policy and the international trend of national security review legislation. The Draft can be improved as regards to legislative model, scope of review, factors reviewed and supervision of review. In the future research, the practicability of judicial review and its detailed rules will be studied further.

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- [1] Until the end of 2016, Chinese outbound investments have reached 190 countries (regions), and Chinese investors set 37.2 thousand enterprises abroad in more than 80% countries around the world. The total sum of outbound investment has reached 5 trillion dollars. (See Report on Chinese Outbound Investment, <http://master.10jqka.com.cn/20171201/c601861384.shtml>) In 2017, the sum of Chinese outbound investment is 124.63 billion dollars. (See website of MOC: <http://www.mofcom.gov.cn/article/ae/ai/201802/20180202714039.shtml>) From January to November in 2017, the sum of Chinese inbound investments is 803.62 billion dollars, which increased 9.8% year-on-year. (See <http://finance.people.com.cn/n1/2017/12/14/c1004-29707615.html>). In January 2018, the number of newly established foreign enterprises increased 168.6% year-on-year. The report of UNCTAD also showed that the sum of Chinese inbound investment reached a record high, making it the top and developing country and second biggest destination for foreign investment. The researcher and director of Multinational Corporation Research Center of MOC, He Manqing Pointed out that the regulation system of foreign investment which complies with the regime of "negative list" should be established and developed promptly, including on-going and afterward monitoring system, foreign investment information reporting system, foreign investment information publicity platform, foreign investment national security review regulation and system, industry security alarming system etc.)
- [2] World Investment Report 2015; UNCTAD: 2016World Investment Report.p5; UNCTAD: 2017World Investment Report.p9
- [3] The results are focused on the following aspects. First, considering that M&As of Chinese enterprises in America were blocked consistently, some researches analyze national security review regime of America and come up with solutions. Second, some researches seek to improve national security review system in China, such as Comparative Study of National Security Review Regime of M&A in America and China written by Chen Chanting, which was published in 2013. Another article written by Yan Jianfeng and Zhao Xiaolei in 2015 involved The Measures for the Pilot Program of National Security Review of Foreign Investment in Pilot Free Trade Zones. (Foreign Investment National Security Review Regime in America and its Inspirations to Shanghai Pilot Free Trade Zone). Professor Qi Tong did a research on the Draft. It analyzed the national security review of China from the perspectives of agencies, scope of review, standard of review and review procedure (Several Critical Issues in Foreign Investment National Security Review Legislation). This is the most comprehensive and representative research, and it is based on the actual legal provisions, which overcame traditional defects in study on systems. Currently, no foreign research on the Draft or the Measures for the Pilot Program was found, but some researched more or less involved. For example, some foreign researchers deemed the anti-monopoly review in Anti-Monopoly Law of PRC as a part of national security review. Some foreign researches involved the Security Review Notice. (Nathan Bush. Antitrust and National Security. Competition Law International January, 2012. 8 No. 1 Competition L. Int'l 43). There are also some foreign researches as regards to the national security review regime in America. (e.g: Jingli Jiang, Gen Li .CFIUS: For National Security Investigation or For Political SCR- TINY? Texas Journal of Oil, Gas, and Energy Law 2013-2014; Edward M. Graham and David M. Marchick. US National Security and Foreign Direct Investment. Washington, DC : Institute for International Economics, c2006 ; Theodore H. Moran and Lindsay Oldenski.Foreign direct investment in the United States : benefits, suspicions, and risks with special attention to FDI from China. Washington, DC : Peterson Institute for International Economics, 2013).
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- [7] See Investment Canada Act, R.S.C.,1985, C.28(1st Supp), Act current to 2013-09-16 and last amended on 2013-06-26.
- [8] See Foreign Acquisitions and Takeovers Act,1989, and last amended on 2010.
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- [10] Tao Lifeng. 2016. "Analysis of the Accountability of Foreign

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- [11] See The Foreign Investment and National Security Act of 2007. <https://www.congress.gov/110/plaws/publ49/PLAW-110publ49.pdf>
- [12] In 1975, CIFUS was established in America based on an executive order, and America began to set up its foreign investment national security review regime since then. In 1988, for the purpose to prevent threat brought to national security of America by M&A from Japan, the US Congress passed section 5021 of the Omnibus Trade and Competitiveness Act of 1988, and amended section 721 of the Defense Production Act of 1950, which is Exon-Florio amendment. Consequently, the legislation was called Exon-Florio provision (hereinafter “the 1988 legislation”). In order to ensure the implementation of the 1988 legislation, the President introduced related implementing regulations. In 1991, Regulation Pertaining to Mergers Acquisitions and Takeover by Foreign Person was promulgated, which established the principle of voluntary report; however, the President maintains the power to block unreported foreign M&A projects. In 1993, section 837 (a) of the National Defense Authorization Act amended the 1988 legislation. This amendment was also called the Byrd Amendment.
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- [14] See The Foreign Investment and National Security Act of 2007, section4.
- [15] See The Foreign Investment and National Security Act of 2007, section2.
- [16] See The Foreign Investment and National Security Act of 2007, section2.
- [17] Qi Tong. 2015. “Several Critical Issues in Foreign Investment National Security Review Legislation.” *China Law Review*, 1:3.
- [18] Which refer to The Measures for the Pilot Program of National Security Review of Foreign Investment in Pilot Free Trade Zones and Notice of the General Office of the State Council on the Establishment of the Security Review System for Mergers and Acquisitions of Domestic Enterprises by Foreign Investors
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- [25] See Sec 2. (a)(3) Foreign Investment and National Security Act of 2007. The U.S. Public Law 110-49-july26,2007.
- [26] Art9.1 Definition, Section A, TPP
- [27] (a) an enterprise; (b) shares, stock, and other forms of equity participation in an enterprise; (c) bonds, debentures, other debt instruments, and loans; (d) futures, options, and other derivatives; (e) turnkey, construction, management, production, concession, revenue-sharing, and other similar contracts; (f) intellectual property rights; (g) licenses, authorizations, permits, and similar rights conferred pursuant to domestic law; and (h) other tangible or intangible, movable or immovable property, and related property rights, such as leases, mortgages, liens, and pledges.
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On the Execution of Fine Penalty in Germany and Its Enlightenment to China

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Abstract: With the trend that penalties of the world having become mitigated and efficient in recent years, all countries tend to improve the using rate of property penalty in the activity of punishing criminals. In Germany, property penalty acts the same role as freedom penalty, both being ruled as the main penalty. By being applied frequently in justice practice, property penalty has since been the hub of German punishment system. This article starts by making an overview of the history of German property penalties. Then, it mainly introduces relevant details of the execution of German property penalty, such as legal bases, executive departments, executive processes, executive ways, subjects and contents of execution and executive prescription. At last, by referring German property penalty system, the writer is trying to give 5 suggestions on the basis of the practical criminal justice of our country: "executive departments which are scientifically defining property penalty", "building probation system for paying penalties", "setting up a substitutional system for property penalty", "clearing the executive range of property penalties" and "adding the executive prescription for property penalties".

Key words: Germany, property penalty, execution, reference

Introduction

The forfeit is one punishment that the court condemns criminals to surrender a number of money to the country.^[1] Feuerbach, the famous criminal law master of Germany in modern times, thought property penalty is one punishment in which the criminal would lose a specific number of money.^[2] By comparing with other criminal punishments, property penalty is mainly characterized as: 1. What property penalty deprives only limits to money, not including automobiles, real estates and other material objects. But the criminal could exchange his material goods into money which can be surrendered as forfeits. 2. The number of forfeit can exceed what the criminal legally owns. 3. What kind of legal interest property penalty is aimed to deprive are belongings. This feature makes it being obviously different from freedom penalty. 4. The forfeit which the criminal surrenders would be nationalized, but not beneficial to victims or courts.

1. The overview of German property penalty

The history of German property penalty could be early traced back to the Germanic time.^[3] During that period, principally, crime (breaking the order) only could initiate some specific reactions of the victim and his or her group. They often required the criminal to pay a number of money for his or her mistakes or made a

self-defense of their own (private punishments). Owing to the destruction that this self-defense might bring to their group, gradually this private punishment had been replaced by atonement contracts (giving horses, poultry and weapons to the victim as one compensation, later money being involved by referring to the seriousness of criminal behaviors and the status of victims). Part of the ransom money was used as a "keeping peace foundation" for all this group.^[4] In the time of Frank, Merovingian dynasty started to make some rules on the issue of signing atonement contract and the details of fulfilling the atonement. "The obligation of signing an atonement makes the right of self-defense slowly being eliminated. Later because of the birth of monetary economy, the number of atonement money could be settled down."^[5] In the early stage of German feudal society, property penalty which had been widely used as many other western countries did played an important role in the punishment system. In the age of enlightenment, property penalty was fiercely criticized as one tool of protecting the privilege of some classes. Beccaria, the founder of criminal classical school, had pointed out, "once every punishment hardly can be expelled the range of property penalty. People's crimes and behaviors of violating public safety are resources of the revenue of the empire. Guardians who undertake the mission of protecting public safety are expecting the infringement of what they are required to supply protections.

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Therefore, property penalty evolves into a squabble between criminals and the national treasury (tax owners of criminal punishments) and civil dispute without considering benefits of the public. It enables the national treasury to discard the right endowed by the work of public protection and turn to use other rights. It cut off the connection between the guilt criminals had taken and the need of building the deterrence of the law. Then, the judge has become the barrister of the national treasury, not the impartial hunter for facts; has become the representative of the national treasury cashier, not the servant and guardian of the law. On the condition of this system, confessing one's own guilty amounts to the fact that he or she is in debt of the treasury. This is one target of criminal procedure at that time.^[6]

Simultaneously when it suffered theoretical criticisms, the use of property penalty was restricted in each western country and Germany was not the exception. At the end age of 19th, with the number of crimes increasing and a huge amount of recidivism appearing, the role freedom penalty, especially short-time ones, came to be doubted. As a result, some western countries began to search for a substitutional penalty which could surmount the deficits of short-time freedom penalty and improve the leniency of criminal punishments. Exactly, property penalty was again highlighted by each country because it could either overcome the shortcoming of short-time freedom penalty or maintain the deterring and striking function of the criminal penalty. Property penalty got an unprecedented development among many countries in the 20th century. For Germany, its criminal law stressed the role of property penalty and widely used it in practice: in the protocol of the *Criminal Code* of Germany in 1909, it had been clarified that the execution of property penalty should be suitable to the economic status of the defendant; in the protocol of *Criminal Code* of Germany in 1919, it has been proclaimed that "the short-time freedom penalty should be avoided being used as much as possible through the operation of probation, admonishment and forfeit which were beyond the rule of the protocol. Under the circumstance of making a choice between property and freedom penalty, freedom penalty should be the last choice when the use of property penalty can realize the target of criminal punishments".^[7] Thereafter, the pioneer of correctional punishment, German criminalist Franz List(1851-1919) came up with a scheme about building punishment system which included the application of property penalty, sentences with sub-conditions and imprisonment, and had a collaboration with France scholar Bonneville de Marsangy in the formulation of *Forfeit Law* (1921-1924) in Germany in which the limit, exchanging fine, economic capability of criminals and details of installment were ruled and a relatively perfect structure was organized.^[8] In Germany, property penalty, same as freedom penalty, was regulated as the main penalty^[9] and the use of it extends to a wide range: according to the writer's statics, the regulation of property penalty could be found in all 30 divisional provisions of the penal code of Germany. Among them,

about 13 specific provisions, their all contents, including "the criminal violation of the operation of constitutional departments (election and vote)" and "the criminal violation of national defense", have been involved with property penalty. Simultaneously, in all 235 clauses of this code, property penalty could be discovered in 158 clauses which make a proportion of 67.23% in all criminal clauses. In judicial practice, property penalty makes a great influence: more than 78% of punishments that the court had sentenced by adult criminal laws were property penalty. In judicial practice, property penalty was used in an extremely frequent way: 1967, forfeit cases dealt by German federal court accounted 62% of all criminal judgements. This number went up to 70% in 1969 and even 84% in recent years.^[10]

2. The execution of property penalty in Germany

"The existence of criminal punishments depends on the execution process. A criminal punishment without possibilities of being executed is neither meaningful nor understandable."^[11] And the execution of punishments is that, the execution institution of punishments ruled by the law, on the basis of a criminal judgement with legal force, try to make contents of this judgement being realized and held different activities to solve legal issues during the process.^[12] The execution of property penalty in Germany could be categorized in several aspects below:

2.1 The legal basis of executing property penalty

Punishments are ruled by criminal punishment regulations. So the change of the criminal law would certainly influence what it rules on criminal punishments.^[13] However, the execution of criminal punishments is not entirely managed by the criminal law, but more ruled by criminal procedure law, administrative law and prison law.^[14] In Germany, there are six main sources of property penalty: 1. *The Penal Code*, it mainly stipulated the respite of property penalty (the reservation of the warning and exemption of criminal penalty); 2. *Judicial Claiming of Debts Rules* and *Urgent Claiming of Debts Rules*, both rules act an interactive role for each other. They clearly regulate every process of the execution of property penalty; 3. *Criminal Procedure Law*, the criminal execution chapter of this law makes some principles for the execution of property penalty. 4. *Criminal Execution Rules*, this rule also has clear requirements for the execution of property penalty. 5. *the law of assisting people* also has relevant stipulations about property penalty and forfeit. 6. *Civil Procedure Law*, it offers some basis for relevant matters of the execution of property penalty whose legal roots can't be found in rules above. In terms of characters, rules about property penalty from *The Penal Code*, *Criminal Procedure Law*, *the law of assisting people*, *Criminal Execution Rules*, *Judicial Claiming of Debts Rules* and *Urgent Claiming of Debts Rules*, are definite and specific. The *Civil Procedure law* could be taken into consideration only in situations that rules described before had no specific stipulations about property penalty.

2.2 *The executive institution of property penalty*

The executive institution of punishments is regulated by criminal law as the main executive subject. For the reason that there are two kinds of criminal execution in Germany, the executive institution can also be divided into two sorts: the static one, including the judicial administration^[15] and jail, and the dynamic one, the prosecutor's office which is collaborated with the court. The criminal executive tribunal which could not be categorized in criminal executive departments takes the main responsibility of judging serious issues in the process of criminal execution. The 451th provision of German Criminal Procedure Law stipulated: 1 the execution of punishments, the prosecutor's office which acted the role of the execution department would carry out the punishment depending on the executive credential which was released by the court clerk and the copy of the writ judgement which had been verified; 2 the prosecutor of a province could only take the responsibility of the execution of criminal punishments which was assigned by the provincial justice administration; 3 the procuratorate, the executive institution, was open to missions coming from criminal executive tribunals of other provincial courts. This transfer of mission should consider both the interest of guilty subjects and the agreement of the executive tribunal.^[16] According to stipulations of these laws, the procuratorate is the executive institution of property penalty. Of course, in real situations, it also could accredit the court clerk to do the execution. This is the same as what the executive tribunal in China had done. For example: the 5th regulation of first sentence of 36th b provision of *the law of assisting people* had made it clear that the execution of property penalty (except freedom penalty) could be completely or partly transferred to the court clerk through the order from local governments. In Germany, the procuratorate which was regarded as the criminal executive departments made the same influence as what the judge, the assistant of judge or the executive tribunal in China had made. This is probably because the court had a cooperation with the procuratorate in handling official business.

2.3 *The executive process of property penalty*

According to the stipulation of *German Criminal law*, property penalty could be used either as one single punishment or an additional penalty with freedom penalty. It also can be regarded as a substitutional or exchangeable punishment for freedom penalty. The 41th provision of *German criminal law* stipulates that the law which even doesn't authorize the use of property penalty or only treats it as a selective punishment can put property and freedom penalty combined to punish someone whose behaviors had made profits or been aimed at making profits.^[17] As the 164th provision of the criminal code of Germany said, someone who was so willing to make other people being investigated or punished by the authority as to violate his or her conscience, had exposed other people's violation of laws or official obligations to authority, authorized officers, military officers or the public. He or she would

be sentenced to property penalty or freedom penalty of less than 5 years imprisonment. At once, the 43th provision of the criminal code of Germany gives the detail of how a property penalty could be executed by freedom penalty: Anyone who can't afford the fine would be punished by freedom penalty. A day of fine is equitable to a day of imprisonment.^[18] The execution of freedom penalty which acts as a substitution would not be lower than 1 day. In Germany, the executive process of property penalty could be dismantled into 4 main parts: recourse, warning, compulsory surrendering and stopping recourse, and simultaneously equipped with some means like searching, the order of mortgaging and subrogation performance.

a. Recourse. According to the stipulation of laws, once the criminal judgement was put into effect that the forfeit should be paid, the procurator's office began to press for this forfeit and the fee which was required to pay for the execution-----the officer of the executive institution should supply a charge list to the institution and sent an order of recourse to the obligor. In this order, the obligor would be informed that he or she should surrender the forfeit to the executive institution by paying money to the local finance department and only had two weeks to finish it. The recourse order is not the necessary part of recourse work for executive institutions. Because there are times when the penalty order had made it clear of relevant stuff, the special recourse order would look unnecessary. The order of dunning could be sent by an informal mail.

b. Warning. If the obligor had not paid the money within the limited period, the obligor would be warned before releasing the order of searching. Generally there would be 10 days before searching for payments. Surely the warning process could be ignored if the officer had predicted that the obligor would snub warnings. For the reason that warning was only the official function of executive institutions, guilty defendants did not have the right to ask for warnings before searching for payments. Warnings could be sent by informal mails and nobody was responsible for the arrival of warnings. If relevant finance departments had not gotten any payments after the warning had been sent out for a condign period or the payment deadline had been exceeded for one week without any warnings. The executive institution could consider which mean they taken in the next step.

c. Compulsory collection. If the effort of recourse proved to be acarpous, the executive institution would search for the payment. According to the first sentence of provision 459th of criminal procedure law, once the fact had been verified that the guilty defendant had the willing of eluding from payments, the work of searching for payments (instantly) could start to operate before the end of the payment period (2 weeks). Searching for payments means that the step would be forcefully executed. The compulsory collection has two prerequisites: 1 the guilty defendant should be proved to have a willing to avoid payments; 2 the compulsory collection could only be put into effect after the

payment period (2 weeks). If the guilty defendant defied the compulsory collection, it had been claimed in criminal procedural law that the guilty defendant could ask the executive tribunal of the court of first sentence to make a judgement.

d. Stop recourse. According to the second sentence of 459th c provision and 459th b of criminal procedure law, there are 3 circumstances that the compulsory collection would be blocked: 1 the prediction that efforts in recent time would not have good performance could stop recourse; 2 the guilty defendant had suffered freedom penalty or successfully applied the probation in the same process; 3 freedom penalty had been executed and prerequisites of the 55th provision^[19] of the criminal code failed to exist. If the execution of property penalty would make the subject hard to return to the society, the court could be able to block or partially block the payment of forfeits. This judgement which would result in the end of property penalty would be taken by either the application or the function of executors. In justice practice, the first circumstance could be more specific---this kind of prediction should be good evidenced-based and the economic status of the guilty defendant would not have any improvements in recent period. When the first circumstance appeared, executive institutions should stop unnecessary actions and use freedom penalty as the substitution. That is to say, the executive institution should put substitutional freedom penalty into effect as soon as it followed the requirement of first circumstance. However, if the remaining number of forfeit were not enough to offset a day of imprisonment, the defendant could be out of punishments. Otherwise, the action of executive institutions should follow the hastening principle of second sentence of criminal executive rules. If executive institutions stop pressing for dunning because of the second circumstance or the third one, this would be the finale of dunning, no need for any substitutional freedom penalty. The executive institution should honestly put reasons of stopping dunning on record so as to be looked and checked. In addition, according to the stipulation of 459th h of criminal procedure law, when the defendant was not in line with what the executive institution decided to stop, the criminal executive tribunal of the first sentence court should make a judgement.

2.4 Executive ways of property penalty

Germany had once put an unlimited property penalty system into practice.^[20] Afterwards the day-fine system was imported from Scandinavia and gradually made the unlimited-fine system being part of history. According to the criminal code of Germany, property penalty could be executed in 9 ways: respite, one-time payment, installment payment, prolonged payment, limit time payment, substitutional freedom penalty, offset by voluntary labor, turnaround execution, exemption of penalty and so on.

a. Respite---reservation of the deterrence of punishments. Although the terminology---respite about property penalty can't be found in the criminal code of Germany, the system of reserving deterrence of punishments could be paraphrased as one respite of

property penalty. The most significant character of it was to exempt someone who was under particular circumstances from paying the forfeit. A probationary period was set in this system that the defendant was required to be abided by specific regulations and obligations. If a defendant was sentenced with 180 days of forfeit, the court could tag the person with guilty without executing the pronounced punishment instantly under certain circumstances. The punishment would be withdrawn only if the guilty defendant hadn't violated any relevant requirements in this period. Generally such circumstances could be concluded in 5 conditions: 1 it is obvious that the defendant can hardly return to a crime even without the punishment; 2 after making a conclusion about behaviors and characters of the defendant, the defendant was identified under certain conditions that he or she could be absolved of punishments; 3 the decision of absolving the defendant of punishments would not violate the operation of laws; 4 the defendant who had gotten a respite from punishments or suffered a punishment in the last 3 years before making this illegal act, by principle, was not allowed to get a respite again. 5 defendants who were sentenced with security measures or one correction, were not allowed to get this respite. Days of the probationary period which was determined by the court was not clearly defined in the law, but not longer than 3 years or shorter than 1 year. During this period the defendant is instructed to: 1 trying to make a reconciliation with the victim or a compensation for what harm his or her behaviors had made; 2 on the duty of giving support; 3 giving a specific number of money to charities or the treasury; 4 asking for outpatient treatments or specific treatments for addiction; 5 participating in curriculum of learning transportation rules. During the probationary period, the court should not ask the defendant for some unexpected requirements. Such 5 instructions, like "trying to compromise with the victim or repay what the victim had lost", given by the court have to be match with the serious degree of his or her behaviors. If there was such a mismatch between behavior severity and punishments, the court would be able to absolve the punishment of the defendant. But this stipulation is not suitable for a defendant who had been sentenced with one year or one year above of imprisonment. The court would withdraw the probation and execute the real punishment as soon as the defendant was found with these behaviors during the probationary period: 1 the defendant commits a crime during the period, the fact that makes it clear that the expectation of the probation had not come true; 2 the defendant seriously or repeatedly violates instructions, or repeatedly refuses supervisions and instructions. So it's reasonable to assume that he or she would return into a crime; 3 the defendant severely or repeatedly refuses to fellow the obligation. If violations happened before the time when the judgement formally went into effect, then the first stipulation of first sentence would find its way there. If the defendant had taken some measures to make remedy, the court could reserve the probation.^[21] The probationary system (reserving the deterrence of punishments) of German property

penalty is a much special executive system of property penalty. The using rate of it was relatively high: according to statistics officially released by Germany, there were 5500 judgements of such case in the year 2003.^[22]

b. One-time payment. Once the criminal judgement with some forfeits goes into effect, the procuratorate starts to make a preparation on every executive step, including recourse, warning, search, compulsory collection and so on, and put all forfeits and the fee required for execution into the treasury in one time. The contents of these executive steps have been clearly described earlier in this review.

c. Installment payment, prolonged payment. The prolonged payment of forfeit is prolonging the deadline for the defendant to pay the fine. Installment payment means that the forfeit could be paid off by several times.^[23] In another word, the guilty defendant paid the forfeit in several times or postponed to pay the forfeit after the judgement goes into effect. Such executions are quite lenient. Owing to the discrepancy of subject and time, there are kinds of installment and prolonged payment: 1 during the trial, the court would directly make sure how this guilty defendant went to pay the forfeit (the deadline or how many times this forfeit could be paid through) by referring to the investigation of his or her property and physical condition. 2 if the physical or property condition of the defendant had changed so as to be unable to pay all the forfeit immediately when the judgement had gone into effect, the executive institution would decide whether this defendant was qualified to get an installment payment or prolonged payment. The court could ask the guilty defendant to supply something to prove that he or she deserves to be treated in a lenient way. Of course, if any new facts happened in the life of a defendant, the executive institution also could choose to make a rescission or change of this lenient execution, and simultaneously redefine details of installment payment or prolonged payment. The decision of cancelling the lenient execution of paying the forfeit should be recorded in files. The defendant would not be entitled with the lenient treatment if he or she failed to pay the installment of forfeit at each deadline of the plan.

d. Limit time payment, it requires the guilty defendant to pay the fine during a limited period. Generally, one-time payment, installment payment and prolonged payment are substantially one kind of limit time payment. However, limit time payment here, has a definition that during the process of executing property penalty, owing to some particular reasons, the executive institution demand the defendant to pay all this forfeit in a limited period. According to the first sentence of the 459th C, compulsory collection (instant recourse), when the guilty defendant was found to willingly avoid forfeit payment, the executive institution would start a recourse 2 weeks after the deadline of paying all or installment of the fine.

e. Substitutional freedom penalty, freedom penalty substitutes the role of property penalty. According to the Criminal Code of Germany, any defendant who can't afford the fine would be

punished by freedom penalty instead. A day of fine is equitable to a day of imprisonment. The execution of freedom penalty which acts as a substitution would not be lower than 1 day. That is to say, on the one hand, when the whole or rest number of money which the defendant is sentenced to give is not enough to be transformed into a day of imprisonment, freedom could not be taken as a substitutional punishment. But the defendant still can't be absolved to pay the remains of forfeit until the recourse go out of its time. On the other hand, if the defendant had paid 9 days of fine out of all 10 days and been unable to afford the last day of fine, he or she should undertake one day of substitutional freedom penalty. In addition, the first sentence of the 40th provision of the criminal code had made it clear that if the defendant were incapable to pay all the fine, the upper limit of the substitutional freedom penalty would not be allowed to exceed 360 days and 720 days when the freedom penalty acted as an auxiliary punishment. Though it has been clarified that the substitutional freedom penalty only can go into operation by the condition of unaffordable forfeit, the defendant would not be entitled with the right to make a choice between property penalty and substitutional freedom penalty, which is an issue decided by the court. If it would be too harsh for the defendant to undertake a substitutional penalty, the court should block the execution of such an execution.^[24] The court is required to make a decision on such a condition that more than one substitutional freedom penalty would be put into fact and recognized as one combined punishment by the executive institution. the defendant could ask the court to make a determination when he or she has disagreements on the result of taking a substitutional freedom penalty. After the final decision of executing substitutional freedom penalty, the executive institution would make it done by initiating a prisoner subpoena and request because of the independence of the defendant during the trial. The request and any other orders which would possibly bring some forceful imprisonments must be withdrawn and subjects who had been put into a jail should be instantly released if the defendant had paid all the forfeit. Actually, the substitutional freedom penalty had been widely used to defendants who could not afford the forfeit. Statistically, 3982 defendants who would have suffered a forfeit in 2008 were punished by the substitutional freedom penalty. 3643 in 2007; 3845 in 2006; 3775 in 2005.^[25]

f. The offset by voluntary labor. In previous time, for the reason that the unemployment rate of federal and state agencies kept increasing because of a stagnation on Germany economy, as a result the executing rate of property penalty suffered a tremendous reduction. Simultaneously the number of times that freedom penalty was taken as a substitutional execution went through the ceiling but prisons which had bogged down in the skyrocketing number of prisoners were incapable of undertaking the mission of accepting more defendants who could not afford the forfeit. In order to reduce the number of substitutional freedom penalty, the 293th of Enforcement act of German Criminal Law had authorized

every state to introduce the execution of voluntary labor to obstruct the use of substitutional freedom penalty. The state government also could entrust the justice administrative department to do the work. According to the stipulation of this law, the fact that guilty defendants had finished the voluntary labor acclaimed the end of substitutional freedom penalty. Of course the labor was voluntary without any targets of get economic interests.^[26] This stipulation had successfully translated expectations of using the voluntary labor to substitute property penalty into realities: after the judgement of substituting property penalty with freedom penalty, voluntary labor could be translated as property penalty. However, voluntary labor which acted an alternative of substitutional freedom penalty only could be put into practice when every condition of practicing substitutional freedom penalty was satisfied. And the guilty defendant was forbidden to willing use voluntary labor to offset the forfeit, because he or she was not entitled with the right to make a selection between property penalty and sub-freedom penalty. Paying the fine by doing voluntary labor only could be realized to hinder the execution of sub-freedom penalty. It was required that the defendant had to apply to the executive institution for a translation from sub-freedom penalty to voluntary labor. The institution should refuse the application in such circumstances: 1 it is reasonable to assume that the guilty defendant is unwillingly or incapable to supply voluntary labor through referring to contents of files or judge assistant reports; 2 the defendant is unable to move freely on the day of making a judgement; 3 voluntary labor will possibly be interfered by his or her job during a specific period. The obstacle of executing sub-freedom penalty would be wiped out with the imprisonment subpoena being sent out as soon as the application is refused. Of course, the defendant could have disputes with the refusal. If the guilty defendant had finished a necessary group of voluntary work hours, this would mean the end of sub-freedom penalty and also the end of property penalty.

g. Turnaround execution. If new special reasons appear when the guilty defendant is in the implementation of alternative freedom penalty or voluntary labor, the court can revoke the decision to replace freedom penalty or voluntary labor, and then restore the implementation of remaining property penalty. In judicial practice, there are the following situations in which the turnaround execution of property penalty is carried out: 1 In the course of the implementation of the alternative freedom penalty, if it were found that the execution was too harsh for the guilty defendant, and after the review of the executive authorities to decide whether or not to bring the order to the court under article 459th of the Code of Criminal Procedure. If the court issued an order prohibiting the execution of an alternative freedom penalty and the economic condition of the guilty defendant was improved, then the penalty would be continued to be enforced on. 2 The convicted defendant may, at any time, fail to pass the decision of the court to grant the use of voluntary labor to replace freedom

penalty, with a serious obstruction hindering the labor and the court's inability to rule out other remedial measures and revoke the compulsory labor decision. Of course, if the penalty execution of the fine penalty may seriously affect its reintegration, the court may order all or part of the imposition of fines and fees.

h. Exempt from punishment. The actual implementation of exempting property penalty could be mainly concluded in the following cases: 1 Guilty defendant who is in the penalty period can be exempted from punishment by the court after the expiration of the trial when he follows court's instructions to fulfill the obligations, and has no re-crime or does not offend instructions (achieve the basis of probation expectations); 2 If the execution of property penalty may seriously affect its reintegration, the court may award all or part of its penalties and the enforcement of the costs; 3 The court may be exempted from penalties if the consequences of the conduct of the perpetrator are serious enough to impose a clear sentence on their sentence.

2.5 Target of property penalty execution

The object of the penalty execution is the sentenced person. The sentenced person, the person makes a crime and then suffers criminal punishments.^[27] The penalty is to force the offender to pay a certain amount of money to the state. Penalties in modern criminal law are limited to deprivation of money. However, in judicial practice, the executive authorities are not always directly to the executor to deprive the money, sometimes need to deprive other property and then into money.^[28] The same is true of the German penalty execution, first of all by depriving the guilty defendant of the amount of money. According to the law, the cash income of the person to be executed, unemployment benefits, income from independent work, commissions and medical insurance and other cash income can all be used to pay a fine.^[29] If the person being executed is a prisoner who is serving a sentence, under the provisions of articles 39, 43-47, 51, 52, 75 and 84 of the German Criminal Enforcement Act, the wages of private money and other property, imprisonment outside the free employment and the independent work of the prison, education allowance and other property, in addition to living expenses and transition funds, can be mortgaged to pay a fine.^[30] If the person to be executed is not available for cash, the asylum of the creditor may apply to the court for a search warrant and then search the house in accordance with the law. If it is found that movable or immovable property is available for execution, the executing agency may grant the power of attorney directly or through the Court of First Instance of the Court of First Instance and then enforce the measures such as seizure, seizure, auction and settlement. At the same time, the power of the terms of the recourse shall be clearly stated as an incidental fee. If the executing authority finds that the other person's creditor's rights and property rights are enforceable, the mortgages and remittance orders may be issued to the third debtor and the debtor by means of mortgages and on their behalf, requiring them to perform as directed by the executive authorities.

In particular, it is important to note that the law provides that the executor's estate can not be imposed on fines. Because "the penalty can only be applied to a person who had committed one crime, and not to an innocent person." That is to say, the judge in the application of arbitrary punishment, not to reach the punishment of the perpetrators of the purpose of the crime and the crime of the person without penalty; b) Do not punish anyone who is not shame of the punishment at the same time. In the case of all members of the organization or most of the members of the crime, the penalty is not against the organization itself, but only for the organization of the guilty members. Therefore, it can be concluded that, c) the penalty for the property of the offender must not be passed on to the heir of the perpetrator.^[31]

2.6 Implementation period of property penalty

In Germany, if a person who is sentenced to property penalty is not executed for a certain period of time, the penalty can no longer be imposed on the offender. According to the provisions of Article 79th (3) (4) and (5) of the Penal Code, the statutory penalty is less than one year, and the penalty is 30 units or more, after 5 years (no longer to execute penalty); Proper penalty less than 30 units of one-day amount, after 3 years (no longer to execute penalty). At the same time, article 79th (5) of the Penal Code also provides that the period of limitation of the execution of a penalty or disposition shall not expire before the execution of another penalty or other dispositions if free penalty and property penalty is sentenced simultaneously, or the sentence also declared deprivation of liberty, recovery, confiscation or seizure in addition. But at the same time the security supervision is on the way, and does not impact the expiry of the execution of the penalty or other dispositions.^[32]

3. Inspiration and reference for our country

In the history of China, forfeit and ransom penalty were combined as one. The status and using rate of ransom penalty are much higher than property penalty. Only in the modern age, property penalty was regarded as a formal punishment organism being involved in the whole punishment system and acted as an accessory part for the main punishment and a minor or peripheral role by comparing with other main punishments. In the history of Germany, its property penalty was not only being used early and widely, but also being categorized as a main punishment which was a key part of German punishment system. Certainly, for the reason that property penalty had penetrated in every corner of all kinds of crimes in provisions of the Criminal Code of Germany, it was skeptically tagged as one abused penalty that runs for rich person. In the judicial practice of our country, the sentencing rate of property penalty is on a relative top position. "but the practice of property penalty is not well-satisfied. Property penalty is one sort of penalty that suffers most problems in the execution by comparing with all kinds of criminal punishments, and still performed as a conundrum which puzzles judicial departments a

lot."^[33] Through analyzing reasons, it could be mainly summarized: the subject who legally takes charge of property penalty in our country is unscientific; executive ways look too meagre; the executive organism is inflexible.

In contrast with vague regulations that our country made for the execution of property penalty, what the Criminal Code of Germany did looks more specific, agile and normative. Although Germany shows a certain difference with our country on aspects, such as political system, cultural tradition, social structure, economy development, justice idea, crime prevention, punishment execution, correctional system, prison administration and so on, as one common rule and developing tendency of criminal law, many successful explorations Germany had made on the area of property penalty like legislation building, abutting measurements and flexibilities of ways, have a great positive influence and reference value on the process of perfecting the property penalty system of our country.

3.1 Scientifically defined property penalty institution

The executive institution of property penalty in Germany is the prosecuting department whose official business was co-sponsored with the court but still possessed with a strong independence. Although it has been clarified by the criminal law of our country that property penalty is executed by the first sentence court,^[34] the court's role of being both the decision-maker and the executor, the same as being both the judge and the athlete during a match, is crippled on the issue of ensuring justice fairness. So there are always much voice of calling for an adjustment. Certainly, the issue that who should own the power to execute property penalty invariably could incite a lot of controversies in the theory area of our country. In summary, 4 views could be concluded: 1 the court for people keeps acting as the executive institution; 2 who the executor is largely depends on which step of the procedure process the defendant is being with: courts on the trial stage, jails on the sentence-serving stage and police departments on release stage and property penalty-only punishment (without any other sanctions);^[35] 3 the police department take charge of all forfeit-executing missions;^[36] 4 the police department acts as the executor of property penalty at present and justice administrations would turn to take charge of it after some conditions had been satisfied.

In the opinion of this review, according to a significant decision about solving many problems of comprehensive promoting Law-based governance from the Central committee of the Communist Party of China: "the justice power should be organized in a better way, so as to put police departments, prosecuting institutions, judicial departments and justice administrations on the way where they belong. We are trying to build a reciprocal-influencing system in which investigation right, procuratorial right, sentence right and executive right could be interactive. Improving the reform experimentation of differentiating the work sentence right from the work executive

right is a way to perfect the justice system. The punishment-executing system should be unified and promoted.”, the writer thinks that the subject who take the execution of property penalty of our country should be shifted from courts to justice administrations. By doing so, either the requirement of separating sentence right from executive right or the expectation of making each justice department find their way there could all be satisfied. What is more, the reciprocal-influencing system for each justice right and the punishment-executing system could both get a promotion. In one word, this work of clarifying each other’s function and right is very salutary for our country to promote Law-based governance comprehensively.

3.2 Setting a probation system for property penalty

A criminal jurist GanYuPei once pointed out: “security measures, probation and release in parole are three carriages for the punishment to step forward on the road of being reasonable.” At present, the probation system for property penalty was set up in the criminal code of countries, including Japan, Czechoslovakia, France, Argentina and so on.^[37] Probation, such a terminology, could not be found in the stipulation of property penalty, but the system of reserving the warning function of punishments is equitable with the probation of property penalty. nowadays, no contents of using probation on property penalty could be discovered in the our country’s criminal law. Such a phenomenon deviated from the goal of logical organizing a punishment-executing system. Because our country had set probation for two serious punishments: freedom penalty and death penalty. The practice of refusing to set up a probation for property penalty, the minor penalty, is not reasonable and does not follow the logic of “举重以明轻”. Indeed, many tips should be noticed when the probation of property penalty is put into use, such as low frequency of using, building serious conditions for its use and setting up a reasonable probationary period. By referring to what Germany has done and the reality of our country, the upper limit of the number of forfeit could be set at 100 thousands yuan and the repeat offender is not allowed to be limited on this. The probationary period could last 2 years and the defendant was required to follow specific regulations and obligations. The order of withdrawing probation would be instantly efficient as soon as the defendant was found to violate the probationary rule.

3.3 Establishing an substitutional system for property penalty

In China, lower executing rate of property penalty is an obvious problem. An important research made by the Supreme Court in 2005 suggested that the executing rate, according to an intermediate court, was respectively 15%, 17.2%, 10.7% from 2002 to 2004, which was only 14.3% per year.^[38] Though the data was collected from 10 years ago, the phenomenon has not been changed much so far. The poverty of executing measures (confined to property) is one of the main reasons contributing to this fact. How to solve this problem effectively? Germany had

formed both the substitutional freedom penalty system and voluntary labor which blocked freedom penalty but replaced the execution of property penalty to reply this challenge. This definitely supplies a good example for us to mimic. Therefore, setting up such systems, like substitutional freedom penalty and serving for the community to replace the defendant’s sentences, would smooth execution of the property penalty for those criminals who are not capable to afford the fine or refuse to pay the fine without a warrant. The precondition of using those alternative measures is certainly that the penalty cannot be carried out. There are various concrete situations with regard to that the penalty cannot be carried out, which include criminals’ poverty and transferring of property maliciously for escaping justice. As a result, the criminal fine exchanging institution which based on principle of equality is designed to ensure that all the criminals could be appropriately punished. A part of property penalty would not be carried out without this system, which would lead to a far greater unfairness. The custody as a replacement for fine is not suitable for minors without doubt, for preventing minors from harmful effects out of considerations of humanitarianism. If the minors have no ability to pay the fine, we suggest using community sentences such as community services as a replacement, which would make the minors not separated from their original living environment but also make them introspect their crimes by practice to accelerate their mental transformation. Meanwhile, the system would enable the minors to assume the responsibility appropriate for their ages, which would reduce the occurrence that parents pay fines for their children to some degree.

4. Define the property scope for the execution of property penalty

Property penalty has been hard to be put on the ground in China all the time. A survey found that the average executing rate of property penalty in the Yanjin Court is 40.7% from 2006 to 2009, and for Guangzhou Intermediate People’s Court, the number is 42.4% from 2001 to 2005. It means that almost 60% of the cases with regard to property penalty cannot be executed^[39] even in those places where the relevant sentencing rate is high from this survey. For those criminals who are sentenced to imprisonment concurrently imposing fines, the rate is particularly lower. For instance, a survey made by a prison management bureau in 2015 finds that among the 5,855 detainees in custody involved in property obligations, the criminals who has carried out property obligation partially is 1,043, and who has not carried out property obligation completely is 3,362, accounting for approximately 75.23% of the total number of detainees. According to the Article 53 in the Chinese Criminal Law,^[40] if a person is unable to pay the fine in full, the court shall demand the payment whenever it detects the fact that the person owns properties for paying fine. It suggests that the executive organ should take action whenever it finds the property which can be executed, even if the criminal is in

his prison sentence. In practice, apart from remittances from families or friends, criminals also has other incomes, such as labor remuneration gaining during the sentence,^[41] or compensation for demolition or land expropriation in some criminals' registered permanent residence. For those properties, depending on China laws, the remaining part at present and after release should be regarded as execution property, which should be withheld and remitted by the executing organs of the property penalty and custody or by organs which pay the compensation for demolition or land expropriation. In addition, according to the Article 232 in the Civil Procedural Law in China^[42] as well as the Article 16^[43] from the Several Provisions of the Supreme People's Court on Enforcing the Property Portion of a Criminal Judgment (Interpretation No. 13 [2014]), if the criminal died, his inheritance would be the execution property. From my point of view, the provision which requires criminal's inheritance should be the execution property ought to be abolished, for it means that the criminal's punishment is transferred to criminal's inheritors.

5. Adding the implementation period of property penalty

The implementation period, also known as the limitation of acting penalty, on the basis of the Chinese Criminal Law, is the time of validity to execute penalty for persons who are sentenced, during which the executive organs have right to execute judgments from the court. Or the executive institutions cannot execute punishments beyond the period.^[44] The Criminal Law of China has not stipulated the implementation period for the property penalty; however, the court could demand the payment whenever it finds the criminal has properties for paying fine.^[45] It is manifested that the original intention that few regulations about time validity in China could recover the penalty at any time so as to guarantee the execution of property penalty, but the real effect is limited. From the perspective of juridical practice, there is nearly no cases where the executive organs would recover the penalty in hot pursuit after many years, so the system performs practically no function. Moreover, it seems unfair the property penalty has no implementation period while for those no matter they should be sentenced to death or life can avoid prosecution beyond the a certain time limit. Therefore, I deem that the Chinese Criminal Law ought to be modified to set up the system for the implementation period of the property penalty just like the Germany. The detailed design is as follows: For those who are sentenced to the property penalty only, the lowest implementation period is five years learned by the Germany; otherwise, the persons subject to enforcement should be recovered within five years after the execution of the their freedom penalty is finished ,or execution power should be eliminate.

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- [17] [China]Sun Mingxian. *Comparative Monograph on Chinese and Foreign Criminal Laws*. Law Press, 2011, p.288.

- [18] Section 40 of the *German Penal Code* (punishment by daily amount) provides that (1) fine punishment is imposed with daily amount as the unit, which should be 5 units of daily amount at minimum and 360 units of daily amount at maximum (if not otherwise provided by laws); (2) the amount of daily amount should be determined by court in view of physical and economic situations of the perpetrator, which is subject to daily average due or potential net income of the perpetrator in principle. One unit of daily amount should be no less than EUR1 at minimum and no more than EUR5,000 at maximum; (3) it can assess the income, property and other basic aspects of the perpetrator for calculation of daily amount.
- [19] Section 55 of the *German Penal Code* (ex post composition of total term of sentences) provides that: (1) as for convicted person of effective sentence put on trial for previous offenses before original sentence prior to completion of pronounced sentence or prior to expiry of time limitation or pardon, provisions of Sections 53 and 54 can also apply. Sentence made after final investigation on the basis of confirmation of basic facts during original court proceeding shall be deemed as original sentence; (2) property punishment, accessory punishment, collateral consequences and punishments originally imposed (Paragraph 8, Subsection 1, Section 11) should remain effective if they are not invalid due to new sentence. If the amount of property punishment originally imposed exceeds property value of the perpetrator at the new sentence, this provision should still apply.
- [20] Section 86 of old *German Penal Code* provides that “offenders of crimes (monstrous crimes) listed in this chapter are subject to a fine of unlimited amount, in addition to punishments prescribed under Section 80 to Section 84”.
- [21] Section 56 f(2) of the *German Penal Code* provides that the court can deny the revocation of suspended sentence if it can be compensated for by the following measures: 1. providing further burden or direction, especially by putting the convicted person under supervision of probation helper; or 2. extending probation period or supervision period of suspended sentence (in this case, extension of probation period of suspended sentence shall not exceed half of the probation period of original sentence). Section 56 f(3) provides that labor service provided by subjects for the purpose of fulfilling burden, voluntarily undertaking work, direction or permission is free of charge, but the court can offset labor service provided for fulfilling burden provided in Paragraph 2 to Paragraph 4, sentence 1, Subsection 2, Section 56 (b) or proper work provided in Subsection 3, Section 56 (b) against punishment if suspended sentence is revoked.
- [22] [China]Si Shaohan. *Study on German Criminal Enforcement Law*. China Chang’an Press, 2010, p. 200.
- [23] [China] Zhang Mingkai. *Outline of Foreign Criminal Laws* (2nd edition). Tsinghua University Press, 2007, p. 395.
- [24] [China]Translated by Li Changke. *German Criminal Procedure Code* (China University of Political Science and Law Press, 1995, p. 175) Section 459 (f)
- [25] [China]Si Shaohan. *Study on German Criminal Enforcement Law*. China Chang’an Press, 2010, p. 207.
- [26] [China]Si Shaohan. *Study on German Criminal Enforcement Law*. China Chang’an Press, 2010, p. 209 & 210.
- [27] [China]Zhang Mingkai. *Criminal Law* (4th edition). Law Press, 2011, p. 546.
- [28] [China]Wang Zhixiang (ed.). *Theory and Practice on Property Punishment Application*. Chinese People’s Public Security University Press, 2012, p. 207.
- [29] [China] Si Shaohan. *Study on German Criminal Enforcement Law*. China Chang’an Press, 2010, p. 203.
- [30] [China] Si Shaohan. *Study on German Criminal Enforcement Law*. China Chang’an Press, 2010, p. 204.
- [31] [German] Anselm Ritter von Feuerbach, translated by Xu Jiusheng. *Textbook of the Penal Law Commonly Valid in Germany* (14th edition). China Fangzheng Press, 2010, p.137.
- [32] Section 79 (execution time limitation) provides that (1) sentence or punishment (Paragraph 8, Subsection 1, Section 11) shall not be executed after expiry of time limitation; (2) execution of life punishment against freedom is not restricted by time limitation; (3) time limitation is provided as follows: 1. Twenty-five years for punishment against freedom with legal sentence above 10 years; 2. 10 years for punishment against freedom with legal sentence above 5 years and under 10 years; 3. 10 years for punishment against freedom with legal sentence above 1 year and under 5 years; 4. Five years for punishment against freedom with legal sentence under 1 year and fine punishment above 30 units of daily amount; 5. Three years for fine punishment under 30 units of daily amount; (5)1 if both punishment against freedom and fine punishment are imposed, or if punishment of deprivation of freedom, recovery payment, confiscation or attachment is pronounced in addition to sentence, the time limitation of execution of one sentence or punishment shall not be expired before that of another; (5)2 however, public security supervision is required, it shall not hinder the expiry of time limitation of sentence or other punishments.
- [33] [China]Wang Qiong. *Empirical Study on Fine Punishment*. Law Press, 2009, p.345.
- [34] Article 2 of *Several Provisions of the Supreme People’s Court on Implementation of Property-related Issues of Criminal Judgment* provides that property-related issues of criminal judgment shall be implemented by the People’s Court of First Instance, which can delegate to a people’s court at the same level where the property is located.
- [35] [China]Wang Zhixiang (ed.). *Theory and Practice on Property Punishment Application*. Chinese People’s Public Security University Press, 2012, p. 198.
- [36] [China]Wang Zhixiang (ed.). *Theory and Practice on Property Punishment Application*. Chinese People’s Public Security University Press, 2012, p. 198.

- [37] Section 25 of 1947 amended *Penal Code of Japan* provides that for servitude or imprisonment of less than 3 years or fine of less than JPY5,000, in one of the following situations, the penalty can be suspended for a period of over 1 year and less than 5 years from the determination date of judgment according to circumstances...; Section 26 of *Penal Code of Argentina* provides that in case of first offender judgment of imprisonment or servitude of less than 2 years or fine, the court can appoint the same judge to announce suspended implementation of sentence. Subsection 2, Section 24 of *Penal Code of Czechoslovakia* provides that accessory punishment will not be suspended due to suspended sentence of deprivation of freedom; however, for fine, various accessory punishments of prohibiting from engaging in certain activities, deportation and prohibiting from living in certain areas, the court can implement suspended sentence, or suspend one of the accessory punishments.
- [38] [China]Yu Jingyao. Analysis of Causes of Difficulty in Implementation of Property Punishment, *Journal of Law Application*, 2007(5), 31;34;34.
- [39] [China]Xiong Moulin. *Empirical Study on Fine Punishment Application*. Southwestern University of Finance and Economics 2015 doctoral dissertation, p. 54.
- [40] Article 53 of *Criminal Law of China* provides that fine should be paid by in lump-sum or in installments within prescribed period of sentence. Mandatory payment will be implemented in case of failure to pay at the expiry. For failure to pay full amount of fine, the people's court should recover payment at any time when it identifies executable property of the person subject to enforcement. In case of difficulties due to force majeure disasters, among others, the fine can be deferred, reduced or exempted according to circumstances after ruling by the people's court.
- [41] Item 4, Article 8 of the *Guiding Opinions on Labor Reform Work of Imprisoned Offenders* of the MOJ Bureau of Prison Administration ([2010] SYZ No. 193) provides that prisons should establish and improve offender labor compensation system, specifically establish standards and utilization measures for withdrawal, management and distribution of offender labor compensation, regularly pay remuneration to offenders participating in labor work. The implementation of offender labor compensation system should adhere to the principles of openness, justice, equality and labor-based compensation, so as to fully mobilize the initiative of offenders. At the same time, it should give consideration to the nature and purpose of the prison and special identity of the offender to avoid adverse social effect. Article 8 of the *Provisions on Offender Labor Hours* of the Ministry of Justice (SFT [1995] No. 065) provides that prison production units organizing offenders to work overtime in accordance with provisions of Article 6 and Article 7 of the notice should arrange compensatory time-off for offenders or pay certain amount of overtime pay according to the length of extended labor hours if it's not practical to arrange time-off. Midnight meals should be provided in case of overtime work after 23:00 in the evening. In case where offenders are organized to work on official holidays, it should pay wages higher than regular overtime pay according to the length of extended labor hours. Midnight meals should be provided in case of overtime work after 23:00 in the evening. Overtime pay for offenders should be disbursed from production cost.
- [42] Article 232 of the *Civil Procedure Law* provides that in case of death of citizens as persons subject to enforcement, debts should be paid out of their legacies. In case of termination of legal persons or other organizations as persons subject to enforcement, the bearer of rights and duties should fulfill the obligations.
- [43] *Judgment* (FS [2014] No. 13) provides that in case of absence of relevant provisions by the Criminal Law, Criminal Procedure Law and relevant judicial interpretations when handling with property-related issues of criminal judgment, the people's court shall, mutatis mutandis, apply relevant provisions of civil execution. 41.
- [44] [China]Zhang Mingkai. *Criminal Law* (4th edition). Law Press, 2011, p. 565.
- [45] Article 53 of *Criminal Law of China* provides that fine should be paid in lump-sum or in installments within prescribed period of sentence. Mandatory payment will be implemented in case of failure to pay at the expiry. For failure to pay full amount of fine, the people's court should recover payment at any time when it identifies executable property of the person subject to enforcement. In case of difficulties due to force majeure disasters, among others, the fine can be deferred, reduced or exempted according to circumstances after ruling by the people's court.

Ancient Chinese Thoughts and Contemporary Chinese View of Sovereignty

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Abstract: Contemporary China is the hybrid of heritage and modernity, continuity and change. Chinese ancient thoughts can be tracked in almost every aspects of Chinese current society. It has heavily influenced China's internal affairs and has a substantial effect on China's foreign policies as well. China has actually integrated selectively traditional thoughts into modern international systems for the best of its own national interests. The idea of a community of common destiny and "one belt and one road" initiative obviously connect contemporary China with its extraordinary Chinese traditional civilization. The traditional idea of "great unification" is decisive for China's strong sense of territorial integrity and unwavering position on Taiwan, Hongkong, Tibet, Xingjiang, and Maco. The outdated tributary system is the profound root of "One country, two system", "one China Policy" and "one China principle". China's adherence to nonintervention principle can also attribute to ancient China's thoughts. However, it is worth to emphasize that the Tianxia view was abandoned and now still in limbo because it is in conflict with sovereignty principle no matter how influential China's ancient thoughts are. Undeniably, analysing the relative ancient China's thoughts is the easy way to understand China's current perception on sovereignty.

Key words: sovereignty, Tianxia, great unification, tributary system, non-intervention

Introduction

As unavoidable is the fact "that the structure of sovereignty, the identity of sovereignty, no less than the identity of an individual or people, is formed by its history, its origins in and engagement with the colonial encounter".^[1] Undisputedly, China as an old civilization state, actually, has the common political and cultural communities which are largely congruent and forged in thousands years.^[2] As Liang Qichao commented many years ago, "The modern Egyptian, Arabs, or Greeks, can hardly claim that they are the true heirs of their respective civilizations, and we do not regard, the Italians as 'Romans', but there is no mistake about the Chinese." He said, "the Chinese are unique, for though we are by no means the only people possessing an ancient civilization, we are the only people who retain the essential features of that civilization."^[3] Chinese continuity of their identity as Chinese is persistently unchanged as Russell suggested: Chinese civilization "has persisted through a continuous evolution".^[4] Today's China, as if the Europe of the Roman Empire and of Charlemagne had lasted until this day, is the only one of the ancient civilizations that has survived the test and scourge of time, and continued till this day, in reinvigorated form.^[5] It is unique that contemporary China continues not only as a state with almost the same size as the empire but also as a community where Chinese have no doubt on their lasting identity of 'Chinese'. That is a decisive factor for nowadays

perception of China on sovereignty. When China as an ancient nation entered into modern history with its own identity, the extremely strong nationalism forced statism sovereignty prevailing over people's sovereignty. Simply because the saving task overwhelmed enlightening, establishing a national state did not at the same step with democratic process.^[6] Unquestionably, the China's ancient thoughts are planted in the minds of Chinese. Both in theory and practice, they have made an indelible mark on the governments, politics, societies, educational practices, and family life of China. The Chinese think inclusively, not exclusively, therefore, they absorb others' experiences, thoughts, theories into their culture. Certainly, others' thoughts or systems are once exploited by Chinese, then, they are normally marked with Chinese unique characteristics while they integrate into Chinese civilization. It is logic to conclude that China's perspective on sovereignty reflects the full acceptance of Westphalian order with Chinese traditional thoughts.

When man mentions China's traditional thoughts and Chinese civilization, Confucianism simply comes out without considering as the main body of China's traditional thoughts. However, Confucianism was not the only major schools in ancient China even though many writers refer Confucian equal to Chinese traditional culture. Three schools of early Chinese thought have played a pivotal role to shape Chinese civilization. Confucianism, Daoism, and Legalism influence Chinese variably according to circumstance. The Daoism pursuit liberality and warships nature, which has blended in Chinese

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normal life for a long time; the Legalism emphasizes rule of law and brutal governance; the Confucianism promotes benevolent and humane authority-moral strength and the neo-Confucianism advocates refraining self for community. Three major philosophies disparate from each other even contradict from each other twist together to shape the character of Chinese and history of China. Likewise, Confucianism, Daoism and Legalism are also complementary that it is almost axiomatic to say that traditional Chinese ‘Daoist in private, Confucian in public; and in some measure Legalist, for people who entered government service also inevitably became partly Legalist.’^[7] The influence of Confucianism on China and Chinese is rather exaggerated so that substantial impact of Legalism and Daoism are overlooked. Such a view obscures the fact that the prevalent social and political doctrines of imperial times were a hybrid of elements from all three ancient ideological currents and, as time went on, elements from other currents as well.^[8]

As Hegel said, ‘Every Philosophy is a philosophy of its own day,... and thus can only satisfaction for the interests belonging to its own particular time.’^[9] No doubt, Chinese ancient thoughts had its own moment. However, traditional Chinese thoughts, mainly composed of the Confucianism, Daoism and Legalism, deeply rooted and mutual permeated in Chinese blood and DNA over twenty-five hundred years, and now are being modernized and revitalized. For instance, the theory of ‘great unified state’ has rooted deeply in China’s perspective of sovereignty and can be decisive for Chinese foreign policy. Indeed, the influence of ancient philosophy could be tracked in Chinese current perception on sovereignty as well. Nonetheless, it is worth to emphasize that the Tianxia world order is not included in the remaining part of China’s traditional thoughts which still maintain influential.

1. The Community of Common Destiny shall be harmony but not hierarchical

In fact, as early as more than two thousand years ago, Mencius considers territory, people, governance (政事) as the treasures of monarchs.^[10] Here, the governance implies sovereignty. Even hundreds years before Mencius, Guan zi used the exact word of ‘sovereignty’ as ‘king’s power.’^[11] Manifestly, the sovereign of Zhongguo did not normally acknowledge other States’ superior power within their own land because the tianxia view saw peripheral states of Zhongguo inferior to emperor’s authority. The hierarchy claim of Chinese rulers and its dominance in its neighborhood regions stunted the external sovereignty from happening. The Tianxia theory is defined as anti-sovereignty concept.

The Tianxia view was initiated by the Zhou dynasty, and has remained as the fundamental principle of other later dynasties and developed afterwards. Tianxia literally means all under heaven. Theoretically, it was regarded as an abstract force,

which people simply had to obey. The theory of Tianxia asserted the ruler’s power from an impersonal deity (Tian) and his accountability to a supreme moral force that guides the humane community. Intrinsic point is that the whole universe is dominated by an impersonal but omnipotent Heaven. A man needs to have the Mandate of Heaven, which entrusts the ruler in the name of Heaven’s son with responsibilities for ‘all under heaven’ (Tianxia), one country as a whole.^[12] Like one sun in the sky, Confucians claimed that China was the only one empire and true civilization in the world. Generally speaking, the Tianxia idea starting from Western Zhou developed in Eastern Zhou increased in importance after Han dynasty and continued as the legitimization of the ruler’s power for the following dynasties till the end of Qing dynasty. Chinese central spheres of influence reverberated and radiated from the tributary system; influence was greater closer to its core and lesser on its periphery. Theoretically, Chinese international relations were conducted as an extension of Chinese domestic policy under the theory of Tianxia. However, such a concentricity was only one side of two mutually complementary aspects of one system.^[13] Undoubtedly, the Tianxia idea which legitimizes the absolute authority of China’s emperors assumes that the whole universe is dominated by an impersonal but omnipotent Heaven. Different from modern sovereignty, it is rudimentary, and only in the form of internal sovereignty. Since it originates from the mandate of heaven, the sovereign of Zhongguo did not normally acknowledge other States’ superior power within their own land because the tianxia view saw peripheral states of Zhongguo inferior to emperor’s authority. The unique system, so-called tributary system, definitely strangled the birth of sovereignty because the system of tribute preached superiority of Chinese imperial over the periphery countries. Consequently, those traditional thoughts are comprehended as the anti-sovereignty and backward ideas and thus, incompatible with modern sovereignty.

Actually, after China’s world order was destroyed, China has been mainly a student and follower of western international order. “On balance, after 150 years of interactions, the Chinese have integrated outside and inside views sufficiently to begin to make contributions to a future international order.”^[14] Today, ensuing China’s rising, Beijing is seemly confident enough to redefine itself distinctively as a peaceful rising state. A number of core Chinese foreign policy elites have begun, for the first time in the history of the PRC, to give extended and public consideration within their written work to how the normative underpinnings of the international system might be reconstituted. During China’s rising, China turns to support its traditional culture reviving strongly. Some Chinese scholars seemly work around the development of a ‘Chinese international relations theory’ by mixing up the western international relations with Chinese ancient thoughts. Recently, Zhao Tingyang suggests

re-building international politics in accordance with a revival of the Tianxia principles which once underscored politics within China's dynastic past. He recommends to see some eliciting points in the all-under-heaven institutions and policies, which are still worthy of consideration even today. And Yan Xuetong also recommends using traditional Chinese thought to re-order a better international system than the current hegemonic system. Yan suggests that China shall try to be a humane kingship country, a superstate grounded in high morals and ethics, to lead this world. He continues to suggest that China will presence such a kind of humane authority in the world, relying on moral power instead of material power of economic advantage or military strength. according to Xunzi's belief that a differentiated, hierarchical norm helps prevent conflict between states, it should bring about a world order more peaceful and secure than that today.^[15] Definitely, those suggest to revive China's ancient thoughts to re-shape a new international order is contrary to the principles of sovereignty and non-intervention. It is worth to mention analysis made by Kim decades ago,

The Sinocentric world order was a concentric extension of the hierarchical principle which prevailed in the domestic social structure of the middle Kingdom . . . It was not a system of international relations in the modern European sense, whose stability was maintained by the balance of power among more or less equal member states. It was instead a system of hierarchical harmony enforced by the preponderance of power and virtue anchored in China.^[16] The principles of national independence, national sovereignty, and national equality, upon which modern international law are built, were meaningless for the Chinese; in fact, they were repugnant to their sense of a universal state and civilization.^[17]

Certainly, the establishment of Chinese school of international relations theory cannot be achieved simply by adding some of Chinese ancient thoughts into western theories. Such an academic phenomenon has not made any difference of Chinese foreign policy but led Certain countries worrying that a rising China might revive the old East-Asian tributary system.^[18] However, since 2013, Chinese President Xi Jinping has used the notion of a "community of common destiny", the concept of a "community of common destiny" has been the central focus of China's relationship with its neighbors and the international community at large. With the initiatives of the Asian Infrastructure Investment Bank (AIIB) and "the Belt and Road," it appears the notion of "a community of common destiny" is not a slogan but an actual move in China's efforts of shaping a new world order.^[19] In 2018, the community of common destiny has been written in the new version of Chinese constitution. Fostering a "new type of international relations" and building "a community of common destiny with mankind" is the primary aim of Chinese foreign policy. With China's more aggressive policies in South China Sea, there are serious concerns

associated with tianxia and "a community of common destiny". The idea is increasingly popular that 'China will rule the world as 'Tianxia' once again.'^[20]

Actually, resurrection of ancient Tianxian view can deepen the theory of 'China's threat ' and renders neighboring states' anxieties. Even though the tributary system concerns more about nominal hierarchy, sovereignty independence is also often about a face or dignity of a state. It does not matter that the tributary system would bring peace or not. It matters that such a system will damage the peripheral states' dignity of sovereignty. Moreover, Beijing has sought to avoid any language that might feed into perceptions that China's military and economic rise was in any way threatening. Furthermore, Beijing consistently rejects the notion of "world law" and any form of supranational system.^[21] Beijing claims a community of common destiny for harmony but no sameness, for peace and sustainable development of the economy, for win-win. It has no any intention involving in political issues but mainly for economic cooperation. Neither "the belt and road" initiative nor Asia investment bank program tries to build a political community. It does not touch the "sovereignty" red line. Indeed, China seemly attempts to explore economic globalization under the current sovereign-oriented international order and claims that other states can share the benefits of China's development if they want to. It shows that China is trying to take advantage of economic globalization to promote its own economy and expand its influence through economic cooperation with other states. As well-known, China has gained sovereignty through long-term and arduous struggle. China understands how import sovereignty is for those weak countries and that it needs their support to build a community of common destiny. The western states advocate human rights-oriented international order, China is not the fan of such an order, thus fully understands the ideological differences with these countries, thus, China conceives a community of common destiny as a society with "harmony but no sameness". It connects the idea of Confucian's "Harmonious World" and mutually respecting sovereignty. Xi Jinping said that China provided a "new option" for "developing countries" to "achieve modernisation ... while preserving their independence."It certainly conveys respect for sovereignty to other states, particularly, those small or weak states. Consequently, China's idea of a community of common destiny seeks only common development and common prosperity, even if China has become the leader of this community through economic influence. It is clear that the world today does not have the environment to revive the "world order" and "tribute system", and China is not powerful enough to revive it at all. In fact, even the ancient China was incapable of implementing the real sense of tribute system or Tianxia order upon the region. The Chinese government has always been known for pragmatism, thus, it only utilizes some traditional Chinese ideas

which can be accepted by all countries to support the idea of a community of common destiny. Hence, China government unwaveringly denied the suggestion of reviving a Tianxia world order by reiterating its insistence on the Five Principles of Peaceful Coexistence in the foreign relations. Xi Jinping reiterates, "No one is superior or inferior to others,... all countries, regardless of their size, strength or level of development, are equal members of the international community, and they are entitled to equal participation in international affairs. ... We should respect diversity of civilizations and promote exchanges, dialogue, peaceful and harmonious coexistence among different civilizations and nations."^[22]

Indeed, it is an explicit denunciation of the application of Chinese traditional view of Tianxia in contemporary international society. He comments that human history has proved that any attempt to establish a dominant civilization in the world is an illusion.^[23] It is also a declaration that China will continue to stick on sovereignty principle to counter the US and its allies.

2. Great Unification Thought and One China policy

In 221 B.C., Qin Shi Huang unified Jinzhou (ancient name of China), finally, expanded Zhongguo ('China' in Chinese) into an imperial, which is recognized at the first time to accomplish the great unification. He governed China with a new centralized and bureaucratic state system to replace the old feudal system and unified the country economically and culturally by decreeing a unified standard of weights, measures, currency, writing and law. Therefore, the Chinese imperial from Qin dynasty is widely accepted as the starting point of 'self-identity' of great unification. In the evolution of thousands of years, the thought of "Great Unification" has evolved into the major ideology in Chinese society. This thought as an imagination in the pre-Qin dynasty came true in Qin-Han dynasty. The former 'Tianxia'-Zhongguo- was transformed as the territory effectively controlled by the emperors through one unitary centralized bureaucratic system. 'Zhongguo' gradually represented the 'Great unification, the identification of a nation collided with the state identification. Dong zongshu portrayed it as such: "Chun Qiu^[24] valued 'the Great unification', as the principle among the sky and earth, and the common sense from the past to today."^[25] In this thought, central plain was always the heartland of Zhongguo of the legitimate central dynasties. During forming and developing of the great unified state, its borders continued to expand and the idea remained and evolved both in theory and in practice. In lengthy Chinese history, wars, conflicts and secessions happened from time to time, however, unification always followed secession. Just like the Chinese proverb says, 'That which is long divided must unify; that which is long unified must divide.' consequently, Since Chinese imperial state first took shape in the Qin dynasty (221 B.C.), the land mass that

makes up the heartland of the East Asian subcontinent has remained under the roof of the great unified entity, which led Chinese political system totally distinguished from European."^[26] It must be admitted that the great unification thought has been significantly influential on the identity of Chinese as a nation and a state. The invisible coherence from it united Chinese in the same land. This puzzle tightly connected with the traditional thought of "great unification".

Due to historical reasons, from the first day when it established, the PRC government confronted the challenge from the ROC government which was former government and had to relocate itself to Taiwan because of losing the Chinese Civil War. Unlike Germany or Korea which had broken into two independent parts in the international community, China refuses to become two states.^[28] China's one China policy embodied very clearly in Shanghai communique in 1972 as follows:

'the Government of the People's Republic of China is the sole legal government of China; Taiwan is a province of China which has long been returned to the motherland; the liberation of Taiwan is China's internal affair in which no other country has the right to interfere; and all U.S. forces and military installations must be withdrawn from Taiwan. The Chinese Government firmly opposes any activities which aim at the creation of "one China, one Taiwan", "one China, two governments", "two Chinas", an "independent Taiwan" or advocate that "the status of Taiwan remains to be determined". and "The United States acknowledges that all Chinese on either side of the Taiwan Strait maintain there is but one China and that Taiwan is a part of China."^[29]

Chinese policy of 'one China' had been evidently embodied in that document and has been carried out all the time. Any state who seeks diplomatic relations with the People's Republic of China (PRC) must break official relations with the Republic of China (ROC), and vice versa. Hence, all the countries recognizing the ROC recognize it as the sole legitimate representative of all of China and not just the island of Taiwan and other islands but also with de jure sovereignty over all of China. Taipei government considers "one China" to mean the ROC, founded in 1912 and with de jure sovereignty over all of China. Later, the 1992 Consensus between the PRC and ROC employed so-called 'one China principle' instead of 'one China policy'. Under this principle, both governments agree that there is only one sovereign state encompassing both mainland China and Taiwan, but disagree about which of the two governments is the legitimate government of China. Chen Shui-bian, the leader of ROC from 1996 to 2004, saw Taiwan as a country separate from China, in opposition to the PRC's insistence that the "One China" principle is a prerequisite for any negotiation. Currently this principle is still carried on by both sides of Taiwan Strait. Apparently, it shows that the idea of 'Great unification still heavily influences Chinese leaders and normal Chinese.

Fairbank, as the most prominent foreign scholar concerning Chinese history and politics, try to elaborate why Chinese leaders felt so strongly about China's unification, commenting :

"It cannot be expunged from the Chinese language or from the minds of the Chinese people. This is not only an idea, but a sentiment, a feeling habituated by millennia of conduct. It attaches the highest importance to Chinese civilization, which consists of all those people who live in a Chinese way...and springs for a sense of culturalism, something a good deal stronger than a mere Western-style nationalism."^[30]

He notes, "From inside looking out, it does seem that key Chinese leaders and thinkers take as their starting point the deep structure that gave shape to the civilization and state that came into being over 3,500 years ago."....."The Son of Heaven was not merely a king or emperor but also the symbol of the system of values that made the Chinese what they were"^[31]

In fact, the 'great unification' is one of those values. While all other ancient empires, such as Rome empire, ancient Egypt, ancient Persia, etc., disappeared in the past, it is a miracle that China basically keeps similar size today as it did as an empire. Indisputably, the traditional idea of 'great unification' is partly responsible for such a miracle. We have to admit that this idea has been still in the deep of Chinese conscience and plays an influential role in the China's perception of sovereignty under the form of nationalism or culturalism.

It is obvious that the idea of the 'great Unification' confronts with independence movement of Tibet, Xingjiang, Taiwan. The sovereignty principle and non-intervention principle simply defend China against flood accusation of its responses to secession operations. The frequency which Chinese spokesmen use sovereignty to defend their anti-secession action is simply countless. In such a context, sovereignty connotes that China has absolute rights to keep territory of China unified. China could not allow any secession and will try any peaceful measure(even military measures in an extreme situation)^[32] to reunified the lost territories. In sum, it is not exaggerate that the territory sovereignty always comes into the kernel issue of national interest of China.

3. "One state, two systems" and the traditional tributary system

Many foreigners could not understand China's persistence on the state's unconditional sovereignty over Hongkong, irrespective of 'one country, two systems' arrangement, as well as its struggles for national reunification as regards Taiwan. This idea allows Chinese regions such as Hong Kong, Macau, and Taiwan to continue to have its own political system, legal, economic and financial affairs, including external relations with foreign countries. Chinese government stations troops in Hongkong to safeguard the national security, not to interfere in Hong Kong's internal affairs. Beijing even promised Taiwan to continue to maintain its own military force under one country

two system.^[33] These regions almost have full jurisdiction over their lands except that they must keep the titles of China. Hongkong and Maco exempt from mainland laws, mainland education system, economic and political systems, mandating the use of simplified characters in publishing and Mandarin in public education and most broadcasting. Hong Kong continues using English common law and Macau continues using the Portuguese civil law system. Chinese supreme court has no jurisdiction over Hongkong and National people's congress has no legislative rights as well. Chinese people and Chinese products cannot enter into Hongkong's territory without particular processes and customs procedures. Such a high degree of autonomy makes China's sovereignty over these regions symbolism. Undoubtedly, it is an extreme compromise on China's sovereignty over Hongkong and Maco.

For a long time, Beijing has fought and still fights against the so-called US-led "soft war" which pursues to export capitalism system to replace the socialism system in China. Nonetheless, the ideology security fear gives way to the traditional idea of 'great unified state'. Interestingly, for Chinese government and Chinese people, reunification is on the top of priority. It does not matter whether Hongkong and Maco make profit for Beijing or how much it cost Beijing to maintain two regions prosperous. It does matter that the two regions under the name of Chinese sovereignty. Such an arrangement is rather similar to Chinese tributary system which only cared about hierarchy and had no intention to govern the tributary countries. Generally speaking, China has been predominant on the Asiatic mainland due to her vast area, immense manpower, and high civilization for thousands years. Chinese Emperors' assertion of the son of heaven has been accepted by some neighboring princes beginning from third century B.C. under the unique system, so-called tributary system. In return, they also received some noble titles and lavish gifts from the emperor, trade opportunities with Chinese, on certain occasions, his protection in case of internal and external difficulties. Such a tributary system virtually attempted to achieve the pacification or control of the periphery usually regarded as essential to prevent attacks on Zhongguo. The pattern of tributary system was usually established between China and the periphery countries or tribes which normally formed a security threat against Zhongguo. In some cases, for the area not posing a significant security threat to Zhongguo, the intention was to sustain the political legitimacy and authority of the Chinese order and to deter potential adversaries.^[34] Essentially, the purpose of the tributary system was to maintain the appearance of peace between China and their neighbor states under the base of unequal relations in terms of Tianxia view which was fabricated for legitimizing the ruling of Chinese emperors. The presumption of harmony was the most easily maintained through a thin and distant official relationship by the tributary system.^[35] In other words, the tributary system

was practically a defense system for Zhongguo to maintain peace with peripheral states. It differed from modern imperialism or colonialism in that China merely claimed suzerainty over these states without the intention of exploiting their economic or other resources or intervening internal affairs.

As well-known, Chinese tributary system required neighbors subordinate to China, however, the suzerainty was symbolically paying their allegiance to China. Actually, China even return the tributary countries much more than what they submit to China so that some comment that China bought tributary relations. The policy of 'one country two systems' gives Hongkong and Macau benefits without profit-pursuing. Like past tributary countries, the two zones maintain highly autonomy and submit nothing to Chinese central government which offers military defense.

One the one hand, the great unification tradition makes China eager to reunify the lost territory; one the other hand, the traditional tributary system allows the reunited territory keeping a extremely high level autonomy almost as a sovereign state. If considering the traditional idea of 'great unification' and the Chinese tributary system, man can easily understand why Chinese accept the 'one country, two systems' and the creator of this system-Deng Xiaoping- also therefore gains Chinese' great admiration.

4. Daoism and the Non-intervention Principle

Daoism maintains that everything exists by its own path or way and nothing can change its way. There is an adage reflecting Daoistic thoughts: 'Clean the snow in front of your house, never pay attention to the frost on the tiles of other people's house.' It suggests people managing their own business and never bothering to intervene others' life. Moreover, Daoism believes that everything has its own Dao(rule) and runs in its own Dao. The outside intervention could damage the Dao and so ruin the promising way to develop. Under the tributary arrangement, Chinese imperial needed the periphery countries to admit only symbolical Chinese leadership and did not concern the internal affairs of the tributary countries. It is perfectly embodied in Chinese non-intervention policy. Furthermore, ancient China has always been a self-sufficient country, self-reliance is Chinese fine tradition. Chinese believe that individual states must learn how to govern themselves, develop themselves by themselves because only they actually know what is the best way for them and only they have rights to choose their own way. After China's opening policy accomplished a rapid growing in economic development, Deng suggested African alliances, "do not follow Chinese model. You must find your own ways to develop."³⁶ When president Xi states, "We should respect the right of a country to choose its own social system and model of development, and oppose the attempt to oust the legitimate government of a country through illegal means seeking

self-interests or imposing one's own views",³⁷ he explicitly means that every state shall govern its own house and let other states worry issues under their roofs, otherwise the world would lose their own way and fall in chaos.

This daoistic idea is deep in Chinese thoughts, consequently, Chinese cannot understand why western powers try to intervene in China's own business all the time. Such confusion just naturally came out while Xi said, 'Some foreigners with full stomachs and nothing better to do point fingers at us - but we don't export revolution, hunger or poverty, nor do we cause trouble for you.' On the contrary, the western politicians, activists, and writers have no idea why Chinese refuse their help. Unsurprisingly, Lucian Pye, an experienced China hand, felt very frustrated, signing, 'China seems impelled to reject the helping hand and to act in ways that seem perversely self-damaging in the eyes of those who believe they have that country's interests at heart.'³⁸

5. The other ancient thoughts influence Chinese decision making

In fact, the legalist constructed the main frame of Chinese bureaucrat system and legal system and cast a significant impact on Chinese politics. Pragmatism as the core tenet of Legalist is everywhere in various aspects of contemporary China. Pragmatism means that foreign policy as well as the interpretation of sovereignty is driven by core national interests, which are identified as national security, reunification, sustaining growth, with its implications for securing resource and energy, and also being willing to work within the realities of global power relationships. In the Chinese mind, wise and far-sighted statesmen are those who can 'adroitly guide action according to circumstances (yinshi lidao)'. Under that influence, practicalism is dominant in the China's perception of sovereignty.

Moreover, all things in the traditional Chinese cosmos function in accordance with Dao, which, in cosmological use, is the way, the process by which the cosmos operates. Since the Chinese conceive of the Universe, seen and unseen, as a single integrated organism, they are not inclined, as most Westerners are, to think in terms of contending, antagonistic polarities such as natural versus supernatural, life versus death, It made Chinese thinking inclusively, not exclusively. Everything belongs, in its appropriate form and role and on its appropriate plane in one undivided cosmic universe. Perhaps, it is the reason why Chinese easily accommodate seeming contradictions, and it is unnecessary for them to differentiate between 'true god and 'false' god. As a result, unlike Westerners, they have not fought holy wars or gone on crusades. Even under the tributary system, Chinese did not like to mess up with others' internal issues because Chinese thought that they had their own Dao. Such a thought can be easily found in current China's non-intervention principle. Likewise, China also unremittedly insists on its own

“Dao” to develop, refuses to completely apply western democracy.

Furthermore, the basic rule of ‘Mean’ of Confucian which pursues harmony by co-existing with heterogeneity has contributed the nowadays’ policy of ‘harmony society’ which respects heterogeneity. Clearly, ‘five peaceful co-exist principles’ also reflect the idea of peaceful “co-exist of heterogeneity”, the essence of rule of ‘mean’. Confucius said, “The gentleman aims at harmony, and not at uniformity. The mean man aims at uniformity, and not at harmony.”^[39] It is embodied in the policy of ‘seeking common ground while reserving differences’ (求同存异) which is the guiding principle in China’s foreign policies.^[40] Additionally, Daoism’s low profile has been carried on in China’s foreign policy since opening and reform policy began. Exactly, traditional China’s thoughts could be discovered everywhere in China’s foreign policy and perspective of sovereignty. However, China’s ancient thoughts are incredibly comprehensive so that it is no way for me to analyze the whole influence of them in nowadays and I can only see the tip of the iceberg.

Contemporary China is the amalgam of heritage and modernity, continuity and change. It is doomed inherently unstable and infinitely complex.^[41] Chinese leaders may be responding to Western demands, but it is doing so in its own way and at its own speed in ‘whatever is necessary to propel China forward and integrate modern ideas with the best of its own national condition. They scrupulously try to make changes in political and social levels step by step, meanwhile they attempt to avoid any possibility to repeat the play of secession which happened to the former Soviet Union. In order to doing so, China knows for sure that it must stick to the sovereignty principle to exclude the outside interventions from western powers.

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On the Connotation of Reform Suggestions of Delegating Power Strengthening Regulation and Optimizing Service in the Field of Higher Education in China

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Abstract: In the light of the structure and quality problems of higher education, on the basis of streamlining administration and instituting decentralization as well as delegating power and strengthening regulation, with the adjustment of power relations, system reform and innovation as means, the vitality of university running is excited, and the optimization service reform in the field of higher education is actively promoted. Based on the analysis of state-related policies, this paper probes into the connotation of the reform of streamlining administration and instituting decentralization, delegating power and strengthening regulation, and optimizing service in the field of higher education.

Key words: Higher education, delegating power and strengthening regulation, service, reform

Introduction

The level of higher education is an important embodiment of the comprehensive competitiveness of the country and is related to the future of the nation. In order to realize the core development strategy of talent power and innovation drive in China, the education reform must abandon the traditional coping style and fragmentation pattern of “find-it and fix-it mentality”; the comprehensive and systematical reform and innovation should be carried out. The reform and innovation of education is not only the structural adjustment of higher education administration and the improvement of quality under simple administrative order. The core is with structural and qualitative problems as the entry points, the adjustment of the power relationship as the fundamental and the reform and innovation of the system as means to perform the self-reform guided by the government departments with the core of streamlining administration and instituting decentralization, delegating power and strengthening regulation. The exploration of the reform of optimization service in the field of higher education is to solve the structural imbalance in the talent cultivation of higher education through the reform of the government departments in streamlining administration and instituting decentralization, delegating power and strengthening regulation. The evaluation of the quality of higher education cannot be measured by a standard; the administrative measures should not be used to define the inane goals and behavior patterns of colleges and universities; the reform rights should be fully put into the main

body of colleges and universities so that the universities themselves have sufficient reform space and autonomy. The construction of “Double First Class” universities with Chinese characteristics is not evaluated by a uniform discipline evaluation, but is evolved on the basis of the endogenous power of economic and social development and market demand. Based on the requirements of the country, under the background that all provinces, cities and autonomous regions will formulate relevant policy documents, by analyzing the connotation of *Opinions on Deepening the Reform of Streamlining Administration and Instituting Decentralization, Delegating Power and Strengthening Regulation, and Optimizing Service in the Field of Higher Education* (hereinafter referred to as “*Opinions*”), this paper provides a specific reference for the implementation of the reform of streamlining administration and instituting decentralization, delegating power and strengthening regulation, and optimizing service in the field of higher education in China.

1. Overview of China’s Opinions on Deepening the Reform of Optimization Service in the Field of Higher Education

In a number of opinions on deepening the reform of optimization service in the field of higher education issued by our country, according to the problem-oriented way, the main purpose of motivating the reform and development of higher education can be achieved by decreasing the burden of colleges and universities and enlarging the autonomy of universities in running schools.

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1.1 Degree Program Authorization and Major Setup of Colleges and Universities

For the situation that there is a relatively strict time requirement on the authorization of a master's degree and a doctor's degree of colleges and universities in China, the *Opinions* has relaxed the time requirement on the authorization of a master's degree and a doctor's degree; for the universities that undertake major scientific research tasks of our country, as long as they meet the standards of authorizing the master's degree and the doctor's degree, they can be authorized; based on *Catalogue of Undergraduate Specialty in General Colleges and Universities* issued by the Ministry of Education, in addition to the specialties strictly controlled by the country, colleges and universities can set up the specialties independently according to the catalogue of undergraduate specialty and combining their own running conditions; the local colleges and universities are encouraged and supported to set up new specialties according to procedures and relevant regulations and in combination with the needs of regional economy and social development.

1.2 Setting of Internal Management Organization and Management of All Kinds of Personnel in Colleges and Universities

In view of the current situation that China's universities belong to the national public institutions in the management system, *Opinions* propose that according to the way of dynamic adjustment of the total amount of personnel, colleges and universities carry out the reform of the current establishment management system. At the same time, it is required that the universities can set up the internal management organization independently, and the administrative levels of the internal management organizations of the university should be canceled by the pilot.

1.3 The Flow of Personnel in Colleges and Universities

In our country, the flow of personnel in colleges and universities is often restricted by administrative management. *Opinions* clearly state that colleges and universities can independently publicly recruit talents and conduct the selection and employment of talents independently and openly according to their own development status and actual needs in the situation that the recruitment or dismissal criteria and conditions are established independently.

1.4 Assessment of the Professional Title of University Teachers

In order to thoroughly change the administration mode of the administrative department to the evaluation and approval right of the professional title of universities, *Opinions* clearly state that it is necessary to put the evaluation right of professional title of university teachers into universities. For this reason, *Opinions* put forward two requirements for universities: firstly, in the evaluation the teachers' ethics should be the primary condition and the teaching achievement should be paid

much attention at the same time; secondly, when the evaluation criteria of the classification title are established, "representative results" and the actual contribution are regarded as the main content of the professional title evaluation.

1.5 University Performance and Salary Distribution

For the lack of incentive and other problems in the performance and salary distribution of colleges and universities in China, *Opinions* clearly state that based on the approved performance salary range, colleges and universities should establish diversified and flexible management methods of performance allocation according to the principle of "cash for work" for the people with outstanding achievements and business backbones, etc. At the same time, the transformation income of scientific and technological achievements obtained by the scientific research personnel in colleges and universities is not included in the total amount of performance wages, and the scientific research personnel in colleges and universities are actively encouraged to carry out various forms of social services.

1.6 The Use of Funds in Colleges and Universities

In order to improve the university fund management method and the division of the centralized payment scope of the treasury, *Opinions* propose that by improving the budget allocation system and optimizing the allocation structure, the payment scope of the financial authority is expanded gradually. In addition, the standard and way of disposal of the assets in colleges and universities are properly adjusted, and the disposal income is reserved for use by the school.

3. Analysis on the connotation of Optimization Service Reform of Power Delegation and Tighten in the Administration and Management of Higher Education

According to the background of *Opinions* issued by the country, based on the current situation of higher education development in China, the current higher education policy has been adjusted, and more efforts are paid on "delegating power" and "strengthening regulation" in the field of higher education.

3.1 Release of the Reform Kinetic Energy of the Education Management Department

The reform needs to break the barriers of interest; the education management department should make its awareness sober and make its deeds initiative, streamline administration and institute decentralization in the field of higher education. At the same time, it is required that the education management department should put the guidance and supervision in place; in the aspects of specialty setup with the right of speech, the professional title evaluation of teachers and interior administration in universities, on the premise of not breaking through the red line of policy, the education management department should accelerate the progress of decentralization, increase the power of decentralization, pay more attention to improving the system, standardize the process, simplify the

procedure, and fully implement the universities' autonomy in running schools to reflect the role and posture of the education management department in the reform.

3.2 Fully Mobilizing the Reform Enthusiasm of Higher Education

There is a wide range of the reform of streamlining administration and instituting decentralization, delegating power and strengthening regulation, and optimizing service in the field of higher education; the reform needs many departments to support and cooperate. Only when the departments such as the preparation offices, the Development Reform Commission, the Office of Human Resources and Social Security and the Department of Finance shall be unified and coordinated in thoughts and actions, can the will of our country be carried out well. According to the requirements from *Opinions* issued by the country, especially in areas like manpower, finance and goods, the relevant departments of all provinces need to reach consensus, actively cooperate with the preparation, human resources and social security departments and refine the reform measures such as the overall management and remuneration of personnel in colleges and universities, so as to ensure that the resources can be integrated and the resultant force of reform can be formed.

3.3 Perfecting the Institutional System of the Reform of Colleges and Universities

Whether the reform measures take effect or the reform is successful, the key lies in the implementation. In order to ensure the implementation of the reform of streamlining administration and instituting decentralization, delegating power and strengthening regulation, and optimizing service in the field of higher education, on the one hand, in *Opinions* a series of institutional arrangements have been made. It also requires the provincial education management department to further transform the work function and management mode, establish the way of spot check, supervision, tour, third party assessment and so on, and strengthen the supervision in the course and afterwards. On the other hand, colleges and universities are required to set up a series of supporting systems to undertake reform on the basis of extensive study and publicity. In the design of the regulatory mechanism and the supporting system, attention should be paid to the development situation of the reform policy to realize the equal importance of policy formulation and policy implementation.

4. Optimizing the Internal Requirements of Service Reform in the Field of Higher Education

According to the requirements of *Opinions*, in the course of promoting the reform of optimization service in the field of higher education, through the construction of policy formulation and policy system, the accurate force in four aspects: innovation,

talent cultivation, resource and element configuration and route selection are actively carried out.

4.1 Reform and Innovation as a Base

Whether it is in the construction of "Double First Class" universities in China or in the course of the transformation development of the application-oriented talent cultivation in the local universities, for solving the problems of development in colleges and universities, it is necessary to break through the old management mode through reform and establish a policy system for supporting the development of colleges and universities. In this background, the past traditional way of administration unification management in colleges and universities has been out of date; in order to make the universities be the motive force to cultivate and promote the economic and social development in talent cultivation, scientific research, service social and cultural inheritance, there is a need to reform the management system of higher education. This is not only the inherent requirement of the development of higher education itself, but also an important symbol of the establishment of higher education with Chinese characteristics.

4.2 Centering on Improving the Quality of talent cultivation

Talent cultivation is the center of the work of colleges and universities, and the improvement of the quality of talent cultivation is the fundamental task of colleges and universities. Although higher education plays an important role in the development of national economy society, in the national development strategy driven by innovation, colleges and universities need to further improve the quality of talent cultivation and undertake the important role in the development of national economy. With the transformation of the national industrial structure adjustment and the economic development mode, the new requirements are put forward in both the level and structure of the talents, and the higher education is objectively required to promote the classification development and the characteristic development, so as to meet the needs of the economic and social development to the talents. Therefore, in order to speed up the classification reform of the development of higher education in our country, it is necessary to deepen the reform of streamlining administration and instituting decentralization, delegating power and strengthening regulation, and optimizing service in the field of higher education; according to the requirements of establishing "Double First Class" universities and the application-oriented talent cultivation requirements of the transformation development of local universities, the resultant force of cultivation should be formed to meet the needs of our country's economic and social development to talents in level and structure.

4.3 It is the key to stimulate the vitality of reform

For the adjustment of the talent cultivation level and structure in the higher education of our country, the activation of

the stock mode of educational factors is regarded as the entry point. Deepening the reform of streamlining administration and instituting decentralization, delegating power and strengthening regulation, and optimizing service in the field of higher education is to change the mode of executive-led efficiency-based reform and establish the dynamic reform based on the stock of elements. To carry out the dynamic reform in the field of higher education, it is necessary to clarify the principal status of the university, implement the autonomy of running the school, take the university itself as the main body, configure its own resources and activate educational elements in accordance with the law of higher education and the development of the national economy to the demand of talents. By making full use of limited educational resources and creating public products that meet the social needs, it is possible to make full use of educational resources and form a pattern for the virtuous circle of educational resources.

5. Conclusion and Discussion

The dynamic reform impetus in the field of higher education needs to be excavated from the university; different from the efficiency-type reform of the top-down administrative lead and the management and control, the dynamic reform needs to be pushed forward from the top to bottom based on the discourse system of the university. The essence of deepening the reform of streamlining administration and instituting decentralization, delegating power and strengthening regulation, and optimizing service in the field of higher education is to establish the independent status of the university in running school, enable the university to more actively face the society and integrate into the society in accordance with the social and economic development requirements, and improve the integrating degree of universities between the quality of talent cultivation and the development demand of national economy. On the basis of following the law of higher education, we can push the university itself to grasp the national industrial layout more actively, strengthen the research on the development trend of the regional economy, and take an active part in the construction and development of the local economy and society. Universities should clarify the principal status of universities in running school, follow the requirements that curriculum reform and professional construction are the foundation of running a school and educating people, optimize the layout of the professional structure of colleges and universities, guide the reasonable positioning of specialties and the reform of the curriculum structure, set up a professional dynamic adjustment mechanism for the development of social economy, and set up the characteristics and benefits of colleges and universities. For a

long time, as there are no construction of incentive mechanism for university teachers, the effective institutional arrangements are not carried out for initiative and creativity of guaranteeing teachers' work. According to the principle that the teacher is the core resource of the university and is the most active element of the productive forces, and according to the guideline of deepening the reform of streamlining administration and instituting decentralization, delegating power and strengthening regulation, and optimizing service in the field of higher education, it is necessary to establish a scientific performance appraisal system to stimulate the vitality of the teachers' work in the aspects of the evaluation of the professional title and the distribution of interests. In conclusion, the reform of streamlining administration and instituting decentralization, delegating power and strengthening regulation, and optimizing service in the field of higher education is to establish the autonomy of colleges and universities in running schools, follow the requirements of the adjustment of the national industrial structure and the transformation of economic development mode for talents, and make the reform and development of higher education in our country guide from the administrative-led efficiency reform to the vitality reform of the university itself. Through the separation of "management, evaluation and conduct", the institutional mechanism of the reform and development of higher education in our country can be established and perfected; the ability of higher education to serve the economic and social development can be enhanced, and we will work hard to ensure that the people are satisfied with higher education.

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Analysis of Influential Elements in Autonomous English Study to the Chengnan Independent College of the CUST Backed by the Network Environment

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Abstract: This paper adopts the questionnaire method to investigate the autonomous learning and training model of the students in the Chengnan College of Changsha University of Science and Technology (CUST) in the network environment. The purpose is to study students' learning motivation, learning strategies, as well as the expectation of teacher's role, so as to explore the students' autonomous learning and training methods: to stimulate students' learning motivation, to cultivate students' interest; to optimize the students' meta-cognitive strategies, to cultivate their cognitive strategies and social emotional strategies; to change the traditional teacher's role into guide, evaluator, motivator, monitor and moderator, which will help to cultivate the comprehensive English ability for the students.

Key words: autonomous study, strategies

Introduction

Chinese Educational Ministry has been stressing on formation of autonomous study in English for a long time. Since the end of 2003, the ministry of education has launched a pilot program for college English teaching reform centering on "cultivating students' autonomous learning ability". In January, 2004, the ministry of education issued "college English Curriculum Requirements (Trial)", in which it was clearly pointed out that a successful important symbol of the teaching model reform is the formation of students' individualized method and the development of students' autonomous learning ability". In "College English Reform Program in 2017", there is clear regulation that "To Take students as the center, to focus on students' needs, to make full use of information technology, to construct and use micro-class, Mooc, to implement a hybrid teaching model based on traditional class, online class and inverted classroom, in order to make students develop active learning, autonomous learning, and individualized learning. Therefore, from 2013, the Chengnan College of the CUST, began to explore actively the reform of college English teaching, trying to shift the traditional "teacher-center" model to the modern "student-center" model backed by the network environment, aiming to promote students' English comprehensive ability, especially listening and speaking skills, and improve students' autonomous learning ability of teaching into college English class.

The Chengnan College of the CUST has carried out the reform since 2009. One of the reformation is to cultivate

students' autonomous study ability in the network environment. In addition to the original 4 lessons per week, the Chengnan College of the CUST adds 2 hours' classes of listening and speaking on line (the main materials are *New Horizontal English for Speaking and Listening level 1-4* together with other online materials) per week, stressing on speaking skills, and improving their autonomous study ability.

The course mainly relies on students' independent learning, and tutors in the classroom mainly conduct individual guidance, responsible for solving problems encountered by students during their independent learning process. So what is the student's autonomous learning state since then? How to cultivate and improve the independent learning ability of students in Chengnan College of CUST? Thus, this research, through the questionnaire survey is to investigate the training path to cultivate the students' autonomous learning ability.

1. Theoretical Format

In the international field, the concept of "Autonomous Learning" appeared in the mid-1970. Henri Holec (1981) mentions in his *Autonomy and Foreign Language Learning* that self-learning is the ability to be responsible for self-management, that is, to determine learning objectives, to choose learning methods, to determine learning content and progress, to monitor learning process, and to evaluate learning outcomes. Zimmerman (1990) identified, if autonomous learners emphasizes metacognition, motivation and behavior, knowing when and how to use a specific learning strategies, to self-monitor and self-adjust their own learning activities, if so, it

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could be called autonomous learning. Pintrich (2000) argues that autonomous learning is an active and constructing process, in this process, students determine their own learning objectives, and monitor, adjust and control their cognition, motivation and behavior, which are affected by their learning goals and environmental characteristics and restrictions.

In the domestic, Pang Weiguo (2003) summarizing the predecessors' research, put forward from two aspects: horizontal and vertical aspects to define autonomous learning. From the perspective of horizontal, he refers to a comprehensive definition of autonomous learning from all dimensions, including motivation, strategy, time-planning, and management, etc. The definition of autonomous learning from the vertical perspective refers to the whole process of learning, from which, essence of autonomous learning is explained, including how to make a learning plan, how to use learning method, and how to monitor learning progress, etc. Pan also pointed out that independent learners are influenced by internal factors and external factors, the internal factors include learning motivation, cognitive strategy, metacognitive developing level, will-control level, gender roles, etc. The external factors include school education, family and cultural factors. This study focuses on learning motivation and learning strategies (the two internal factors), learning motivation explains why to learn, and learning strategy explains how to learn, both of which are two basic elements of the autonomous learning.

At the same time, this paper is to discuss college education, it will also investigate students' expectations for the role of teachers in the process of autonomous learning.

So this study mainly discusses the following three problems in the Chengnan College of the CUST under the environment of network: the current situation of the students' English learning motivation,; The use of English learning strategies for students; Students' expectation for the role of teachers in the process of autonomous learning; From the study, the specific method of training students' autonomous learning ability will be discussed.

2. Research and Findings

This study used Likert' 5 subscales classification formulation to make the survey questionnaire of the present situation of autonomous learning in the questionnaire, its options vary from "strongly agree" (5 points) to "strongly disagree" (1). The whole

questionnaire has 60 questions, including English learning motivation (22 questions), English learning strategies (20), teachers' role (18). When the questionnaire design is completed, the reliability is tested in one class, the testing coefficient is 0.972, the results of the project analysis show that the questions of the questionnaire are well differentiated, so the results of this questionnaire are reliable and effective.

Research Group in May 2016 take undergraduate students in the Independent Colleges of CUST for questionnaire investigation, after recycling, 220 are valid questionnaires, the effective rate is 96.3% to quantify the all questionnaire option, SPSS19.0 is used for statistical analysis of the questionnaire data.

2.1. Autonomous Learning Motivation

Gardner and Lambert (1972) divided motivation into two categories from the perspective of social psychology: "Integrative Motivation" and "Instrumental Motivation". "Integrative Motivation" refers to that the learners expect to integrate the target language group into the culture; Instrumental motivation means that learners use language as a tool and achieve a practical goal, such as through a test, to get a well-paid job. Another classic division is intrinsic motivation and extrinsic motivation (David. C. McClelland, 2014).

The former is a learning desire without external pressure from the heart, such as interest, ideal, and the desire for knowledge, etc. The latter is directly related to the individual's future or economic interests, such as obtaining extrinsic reward, competition, or examinations, etc. It is generally believed that the integrated motivation corresponds to intrinsic motivation, and the instrumental motivation corresponds to extrinsic motivation. Gao Yihong (2003) proposed that there are seven types of motivation for undergraduates' English learning motivation in Chinese universities: Internal interests, achievements, situations, going abroad, social responsibility, personal development, media. The questionnaire survey of the motivation part considering Gao Yihong's idea about study motivation and the internet study environment, and also puts forward seven learning motivation factors: learning attitude, achievement motivation, learning freedom, emotional motivation, development information, media, and learning interest. The collected 231 questionnaires were put into the computer and SPSS19.0 was used to carry out the statistics, described as follows.

Table 1

| learning strategy | number of people | mean value | standard deviation |
|------------------------|------------------|------------|--------------------|
| learning attitude | 231 | 4.49 | 0.57 |
| learning freedom | 231 | 4.41 | 0.63 |
| Developing information | 231 | 4.48 | 0.63 |
| information media | 231 | 4.33 | 0.73 |
| emotional motivation | 231 | 4.18 | 0.72 |
| learning interest | 231 | 4.09 | 0.81 |
| achievement motivation | 231 | 3.73 | 0.88 |

From table 1, the two dimensions of learning attitude and learning freedom are quite high, 4.49 and 4.41, respectively, from which it can be inferred that most of the students, the overall impression on the *New Horizontal Independent Learning System* is good, and the students have realized the importance of independent learning. In addition, the students accepted the advantages of autonomous learning in network, it has a large number of resources on the network which could be used at any time and at any place, and students can adopt different learning method according to their own, etc.

The two dimensions of study development and information media are above 4.3, this shows that students have recognized the benefits of network autonomous learning, and know the network autonomous learning is helpful to improve their English comprehensive ability, and to cultivate their independent thinking ability. At the same time, the content of the “New Horizon” serials can also help students understand foreign cultures. The two dimensions of emotional motivation and interest in learning are about 4.0, showing that students are more interested in network autonomous learning, and could more relax both bodily and spiritually in the network autonomous learning environment, avoiding some embarrassment in a traditional class. Achievement motivation is of the lowest average, only 3.73, not because the “New Horizon” book serials are required, or occupy a certain proportion in the final exam, this is unexpected. At the beginning of the network autonomous learning, in order to urge

students to study self-consciously, teachers reiterated its proportion in the final exam, but from the survey, it reveals that achievement motivation in students' learning motivation is the smallest proportion.

2.2 Autonomous Learning Strategies

For learning strategies, O'Malley & Chamot(1990) proposed a three-point strategy, including cognitive strategy, meta-cognitive strategy, and social emotional strategy.

Metacognitive strategies include such strategies as planning, monitoring, evaluation and problem identification, which is making learning plans, monitoring learning processes, evaluating learning effects, and finding problems and making adjustments.

O' Malley & Chamot believes that the success of learners depends largely on the metacognitive strategies. The social emotional strategy refers to the strategies that learners can improve their learning efficiency by communicating with others and adjusting their emotional factors, such as enhancing self-confidence and cooperation with others. On this framework, this study also divides the learning motivation into cognitive strategy (e.g., notes and review) metacognitive strategies (such as planning, monitoring, evaluation, and regulating), social emotional strategies (such as adjusting and cooperation). The questionnaire survey is designed in these three dimensions to find the status quo of autonomous learning strategies.

Table 2

| learning strategy | Number of students | mean value | standard deviation |
|---------------------------|--------------------|------------|--------------------|
| metacognitive strategy | 231 | 4.38 | 0.53 |
| cognitive strategy | 231 | 4.21 | 0.76 |
| social emotional strategy | 231 | 4.10 | 0.60 |

It can be seen from table 2, the mean value of three strategies are above 4.0, but the highest average is meta-cognitive strategy, students tend to use this strategy in the process of autonomous learning, such as making planning, allocation of time, monitoring and record of their own learning, to learn self reflection and self evaluation, and adjust study plan and schedule according to the phase of learning situation. The mean value of cognitive strategy is a little lower, students are weak in reviewing, combined with observing and monitoring the situation of students' autonomous learning. The mean value of social emotional strategy is the lowest, students is influenced by disgusting, distraction, lack of confidence, and lack of cooperation or communication with others in the process of learning.

2.3 Students' Expectations of Teachers

With the application of autonomous learning concept, teachers' role also faces new challenging. There are also much discussion about the role of teachers in the new teaching mode. Boud(1988) believes that the cultivation of autonomous learning

ability is not simply to abolish teachers' teaching, but to teach better. Little(1991) pointed out that teachers play an irreplaceable role in cultivating students' autonomous learning ability. Zimmerman and Risemberg(1997) advocated that teachers should promote students' autonomous learning from four aspects. (1) Stimulate students' intrinsic learning motivation. (2) Focus on autonomous learning strategies. (3) Instruct students to conduct self-monitoring. (4) Teaching students to use various resources. Gardner & Miller(1999) summed up the multiple roles that teachers play in autonomous learning: consultant, estimator, evaluator, text-book developer, organizer, leader, and so on. He Lianzhen (2011) studied the current situation of teachers under the new model, and divided the teacher's roles into: planning guides, monitoring regulator, classroom organizers and resource promoters. But what role do teachers play in the autonomous learning process for the independent college students? This paper puts forward the framework, combining the suggestion by experts/scholars, and practical teaching situation in the Independent College of

CSUST, teachers' role will be divided into: Learning resources promoter, study planning guide; the motivator of learning interest, self-learning monitor/regulator/examiner, self-learning evaluators. Through these five dimensions, students are surveyed to reveal the expectations of independent college students in the

process of independent learning. Through these five dimensions, the questionnaire is undertaken to learn about independent college students to the teacher's role expectation in the process of autonomous learning.

Table 3

| Teacher's role | Students | Mean Value | Standard Deviation |
|---------------------------------|----------|------------|--------------------|
| Study planning guide | 231 | 4.52 | 0.47 |
| Resource utilization promoters | 231 | 4.51 | 0.46 |
| Independent learning evaluators | 231 | 4.43 | 0.56 |
| Interest motivators | 231 | 4.30 | 0,73 |
| Monitoring regulators | 231 | 4.12 | 0.79 |

As can be seen from table 3, the two dimensions of the study planning guide and resource utilization promoter are the highest, both of which are 4.5. It shows that students hope greatly that teachers can guide them to make study plans, to understand the needs and characteristics of different students, and help them to make learning plans according to each student.

Second, the network autonomous learning, after all, has the very big difference with the traditional classroom, the students also hope teacher can help guide them to use various resources on the network more effectively, and help them to search and find helpful information quickly, and often recommend useful English learning material to students. The mean value of independent study evaluator is a little above 4.4, showing students also attaches great importance to teachers for their autonomous learning to make assessment and evaluation, students can adjust their autonomous learning situation according to the evaluation of teachers timely.

The two mean values of learning interest motivator and learning monitoring moderator is lower than the first three dimensions. In particular, the study monitoring moderator has the lowest mean value, 4.1. It reflects the students' ambivalence: they wish the teacher's guidance to assist and evaluate, but are also unwilling to accept the teacher's supervision.

3. Enlightenment to Cultivate Students' Independent Learning Ability

Independent college students have their own characteristics. Although it is admitted through college entrance examination, the admission line is normally lower than that of ordinary colleges, most students have poor English proficiency. Therefore, it is impossible to copy the training mode of ordinary undergraduate college. This questionnaire surveyed in the Chengnan Independent College of CUST is just an example of the independent college students in autonomous learning motivation, learning strategies as well as the expectation of the teacher's role, this survey of cultivation of students' autonomous learning ability for independent college provides the beneficial enlightenment for all the independent college in autonomous

learning model training.

3.1 To Stimulate Students' Learning Motivation and Cultivate Students' Interest in Independent Study

Learning motivation is the first condition of independent learning. With certain learning motivation, students will have the motivation to study independently. According to the results of the questionnaire survey, the learning attitude, the learning freedom, learning development, and information media have a higher mean value. It shows that students are aware of the advantages and importance of autonomous learning and realize the help of autonomous learning in the network environment.

However, the lower mean value of learning interest indicates that although students are conscious, they are not necessarily motivated to study independently because of their interest. Interest is the best teacher, so in the process of cultivating autonomous learning, teachers should focus on cultivating the students' interest in learning, such as teaching students some effective methods, to upload some video or interesting materials, to organize various classroom activities, etc.

3.2 To Cultivate and Optimize Students' Independent Learning Strategies

The results of questionnaire survey show that students use metacognitive strategies in the process of autonomous learning the most, and metacognitive strategies play a crucial role in autonomous learning. This requires that teachers should help students to optimize the study plan, self-monitoring, self assessment, and self-control, to help students cultivate autonomous learning effectively.

In addition to the metacognitive strategy, cognitive strategy is also very important to autonomous learning, for independent college students, it is quite necessary for the students to get online learning materials to practice, from the usual practice, most of the students just finish the exercise according to the requirement, but only a handful of students carry on the review, and sums up the key points and difficult points to practice repeatedly into memory. Besides, according to the questionnaire survey results, the mean of social emotional strategy is the

lowest, so it is necessary to cultivate students' self-confidence and encourage students to cooperate and learn.

3.3 Teachers' Important Role in the Process of Students' Autonomous learning

In the autonomous learning under the environment of network, teachers should first change roles, the teacher is no longer the traditional leader of the class and the imparter of knowledge; teachers should not be completely excluded, putting students in a complete free situation; teachers should play a very important role in autonomous learning in the network environment; teachers should help students make learning plans and guide students to make more effective use of the network platform to gain more resources; teachers should also evaluate students' learning activities and give timely feedback; teachers should stimulate students' interest and monitor their learning progress and learning effects, etc. All these changes perhaps require teachers for more responsibility, such as network experts, psychologists, researchers, etc., which will be discussed in another paper.

Conclusion

To sum up, to cultivate the autonomous learning ability of independent college students, three things should be done: learning motivation, learning strategy, and teachers' role. The concrete methods are: to stimulate students' learning motivation, and to cultivate students' interest emphatically; to optimize the students' metacognitive strategies, cognitive strategies and social affective strategies; to change the traditional teacher's role, teachers should become study-planning guide, resources conductor, resource promoters, learning evaluators, interest motivators, and study-monitoring regulators. Only in this way can autonomous learning in the network environment be effectively combined with traditional classroom learning, and can students also improve their independent learning ability and cultivate their independent learning ability.

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Practice of Mathematics Education in Chinese Primary Schools: A Case Study of Beijing Chaoyang Experimental Primary School

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Abstract: In recent years, Chinese students' mathematics achievement ranks among the top in various international surveys and competitions, which has aroused widespread interest in academic circles around the world. This paper is a part of a series of four reports, which trace the origin of mathematics achievement from practice of mathematics education in Chinese primary schools by taking Beijing Chaoyang Experimental Primary School as a case to explore the factors affecting students' mathematics performance. The case study investigated the status quo and characteristics of Chinese primary school mathematics education from the aspects of Chinese mathematics standards and curriculum, primary school students' mathematics learning, teachers' teaching characteristics, and the school's teaching quality assurance practices. This paper provides the background of Beijing Chaoyang Experimental Primary School and the application of the national mathematics standards and mathematics curriculum at the school.

Key words: Mathematics education, Beijing Chaoyang Experimental Primary School, case study, mathematics standards, mathematics curriculum

Introduction

This report uses Beijing Chaoyang Experimental Primary School as a case to explore the status quo and characteristics of primary school mathematics education in China. In the paper, the background of the school will be introduced first, and then the application of the national mathematics standards and mathematics curriculum at the school will be explored.

1. Introduction to Beijing Chaoyang Experimental Primary School

Beijing Chaoyang Experimental Primary School is a full-time public elementary school established in 1956, which is situated in Chaoyang District, Beijing China. There are more than 400 teachers and more than 4,000 students in the school. The campus is distributed at six different places.

The School implemented a six-year primary education system (The People's Congress of PRC, 2006). Each school year is divided into two semesters, Spring and Autumn, and the total class time is 35 weeks. The School arranges traditional activities, cultural festivals, sports games, and excursions for 2 weeks, and prepares students for the exams for 2 weeks. There are 13 weeks of summer and winter vacations and national legal holidays. The Autumn semester (the first semester) starts every year on September 1 and ends in the

middle or late January of the following year. The Spring semester (the second semester) starts every year in late February and ends in mid-July. The school opens from Monday to Friday, starting at 8:00am every day and finishing school at 4:00pm.

Table 1. School Timetable

| No. | Time | Contents |
|-----|-------------|-------------------|
| 1 | 8:00—8:40 | The first lesson |
| 2 | 8:40—8:50 | Recess |
| 3 | 8:50—9:30 | The second lesson |
| 4 | 9:30—9:40 | Recess |
| 5 | 9:40—10:20 | Sports activities |
| 6 | 10:20—10:30 | Recess |
| 7 | 10:30—10:35 | Eye Exercises |
| 8 | 10:35—11:10 | The third lesson |
| 9 | 11:10—11:20 | Recess |
| 10 | 11:20—11:55 | The fourth lesson |

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| | | |
|----|-------------|-------------------|
| 11 | 11:55—13:30 | Lunch break |
| 12 | 13:30—14:05 | The fifth lesson |
| 13 | 14:05—14:15 | Recess |
| 14 | 14:15—14:20 | Eye Exercises |
| 15 | 14:20—14:55 | The sixth lesson |
| 16 | 14:55—15:00 | Recess |
| 17 | 15:00—16:00 | Social activities |
| 18 | 16: 00 | Classes are over |

The school adopts national, local and school-based curriculum. The main courses include: Morality and Life, Morality and Society,

Chinese, Mathematics, Foreign Languages, Science, Sports and Health, Music, Fine Arts, and Integrated Practice Activities. On average, each subject should have no less than 10% of the total hours to be used to set up courses for practical activities in the disciplines and conduct interdisciplinary comprehensive practical activities. The municipal local courses include special topics of comprehensive education courses, excellent traditional Chinese culture, calligraphy, Chinese dreams, career education, our cities, and I love Beijing. The special topics of comprehensive education courses integrate the topics of drug prevention, HIV prevention, environmental and sustainable development, safety and self-rescue education, health education, and etiquette education. The School-based curriculum includes "Three Sheng Education" (life education, survival education, living education), "Three Li Education" (courtesy education, etiquette education, politeness education), sunshine football, etc.

Table 2. Curriculum of Beijing Chaoyang Experiment Primary School

| Courses/Year/Hour | | 1 | 2 | 3 | 4 | 5 | 6 |
|-------------------|---------------------------------|----|----|----|----|----|----|
| National course | Chinese | 8 | 8 | 6 | 6 | 6 | 6 |
| | Mathematics | 5 | 5 | 4 | 4 | 4 | 5 |
| | Morality & life | 2 | 2 | | | | |
| | Morality and society | | | 2 | 2 | 2 | 2 |
| | Foreign Language | 3 | 3 | 3 | 3 | 3 | 3 |
| | Science | 1 | 1 | 2 | 2 | 2 | 2 |
| | Sports & Health | 4 | 4 | 4 | 4 | 4 | 4 |
| | Music | 2 | 2 | 2 | 2 | 2 | 1 |
| | Fine Arts | 2 | 2 | 2 | 2 | 2 | 1 |
| | Integrated practical activities | | | 2 | 2 | 2 | 2 |
| distract course | Handwriting | 1 | 1 | 1 | 1 | 1 | 1 |
| | Class meeting | 1 | 1 | 1 | 1 | 1 | 1 |
| | special topics | 1 | 1 | 1 | 1 | 1 | 1 |
| | district course | 1 | 1 | 1 | 1 | 1 | 1 |
| Total | | 30 | 30 | 30 | 30 | 30 | 30 |

2. Application of the national Mathematics standards and Mathematics curriculum

In China, Mathematics is a basic subject at the primary school, and its purpose is to cultivate students' mathematical thinking and ability to solve problems.

2.1 The national standards for mathematics curriculum

According to the national standards the mathematics curriculum (Ministry of Education of PRC, 2012) in the compulsory education stage is the basic curriculum for cultivating citizens' quality. It is a basic, popular, and developmental curriculum. The mathematics curriculum enables students to master the necessary basic knowledge and basic skills, develop students' abstract thinking and reasoning skills, cultivate students' innovative awareness and practical ability, and promote students' development in terms of emotions, attitudes and values. The mathematics curriculum of compulsory education can lay an important foundation for students' future life, work and study. The design of the mathematics curriculum in the compulsory education stage fully considers the features of the students' mathematics learning at this stage, which is in line with the students'

cognitive level and psychological characteristics, is conducive to inspire students' interest in learning, and triggers students' mathematics thinking; fully considers the characteristics of mathematics itself, The essence of mathematics, while presenting the mathematical results as knowledge and skills, it also emphasizes the students' existing experience and enables students to experience the process of abstracting mathematical problems, building mathematical models, seeking results, and solving problems from the actual background.

Each teaching content in elementary school has clear teaching requirements. There is a clear two-way breakdown in the "Mathematical Exam Description". The table lists the knowledge points (content points) in each field and contains a detailed breakdown and description of the content contained in each knowledge point. Details have clear teaching requirements. The requirements are divided into four levels: "recognizing," "understanding," "mastering," and "application." They are represented by A, B, C, and D in the bidirectional breakdown.

| 知识内容 | 知识点 | 分项细目 | 考试水平 | | | |
|------|---------|----------------------------------------------------------------|------|---|---|---|
| | | | A | B | C | D |
| 式与方程 | 用字母表示数 | 1. 用字母表示数，表示常见的数量关系 2. 用字母表示运算定律 3. 用字母表示公式 | | | ✓ | |
| | 简易方程 | 1. 方程的意义 2. 用方程表示等量关系 3. 等式的性质 4. 解方程 5. 列方程解决实际问题 | | ✓ | | ✓ |
| 比和比例 | 比 | 1. 比的意义和性质 2. 求比值和化简比 | | ✓ | | |
| | 按比分配 | 1. 按比分配问题的特征 2. 解按比分配问题 | | | ✓ | ✓ |
| | 比例 | 1. 比例的意义和性质 2. 解比例 | | ✓ | | |
| | 正比例和反比例 | 1. 正比例和反比例的意义 2. 判断两种相关联的量是否成正比例或反比例 3. 用图像表示正比例关系 | | ✓ | | |
| | 实际问题 | 与比和比例有关的实际问题 | | | | ✓ |
| 探索规律 | | 探索给定事物中隐含的规律或变化趋势 | | | ✓ | |

Figure 1. Mathematical examination illustrates bidirectional breakdown

Students should meet the requirements of the curriculum standards through their studies in the elementary school. At the end of the primary school, there is a uniform graduation exam in the entire district. The content of the examination is based on the requirements of the “exam description”. Graduates can graduate after passing the exam, and they are required to participate in the make-up exams if they failed graduation exam.

2.2 The application of mathematics education in Beijing Chaoyang Experimental Primary School

The school has always been committed to mathematics education. The former Principal of the school Ma Xinlian is the famous super-class mathematics teacher, and the current Principal Chen Lihua is also a mathematics super-class teacher. At the school level, it analyzed the knowledge structure of primary school mathematics textbooks from grade one to grade six and refined the content of textbooks into 58 training lessons. Students can use four years to complete the content that they should study in six years, and they can guarantee a higher learning efficiency. At the school, students learn to be relaxed and happy. The following brief examples illustrate the school’s application of mathematics education.

2.2.1 The key to effective teaching design

At the school, the object of mathematics teaching is students. If teachers want to teach mathematics well, they need to understand the students and accurately grasp their psychological, age, and knowledge base. The teacher's long-term stay with the students will gradually deepen understanding of the students' mentality. It has been found that it is difficult for the students to grasp the knowledge accurately. To help students’ grasping mathematics knowledge accurately, at the school level there is a need to pay attention to students' conditions and design teaching effectively. In 2008, the

school gathered the wisdom of all teachers and developed a digital campus system. The digital campus system can accumulate data in the student's learning process. Through scientific analysis of the data, teachers can discover the crux of the teaching and adjust the teacher's teaching and student's learning in time so that the teaching can be more targeted. After several years of application, the school believes that data analysis under the information environment has the following applications:

First, based on the large amount of data accumulated by the digital campus system, the pertinence of teaching management can be improved. For managers, it is difficult to accurately understand the situation in each class, especially for schools with more classes. The data of each class is recorded in the digital campus system, so that the teaching administrator can analyze the data of each class's students about knowledge acquisition. Based on these analyses, the teachers can be guided in a targeted manner, thereby improving the teaching management.

Second, based on the large amount of data accumulated by the digital campus system, the teaching and research group's teaching and research activities can be targeted. The accurate positioning of problems in grades or disciplines, the rapid and timely detection of problems in teaching, discussion around issues, and finding ways to solve problems are prerequisites for the effectiveness of teaching and research activities. Data analysis can provide support for accurate positioning problems.

Third, based on the large amount of data accumulated by the digital campus system, individual tutoring can be targeted. As the digital campus system accumulates long-term data for each student, based on these data, each student's problems in learning can be analyzed. Teachers can analyze the causes of students' mistakes by

analyzing these problems and understanding students in peacetime. To guide each student, the most difficult for teachers is how to provide targeted counseling and assistance to students. Schools and teachers have been doing a lot of hard work for the “individualized” counseling of students, but more often “individualized” counseling only stays at a certain level and lacks in-depth research. Therefore, many teachers tend to give lectures to students on the day they are wrong, and then practice a few related topics. This may of course play a role in counseling, but it often lacks overall arrangements. It lacks a deep understanding of individual students, such as whether his knowledge structure is complete, and the effect of counseling is not obvious. However, data analysis allows teachers to gain a deep understanding of the students’ learning situation and to formulate measures to counsel students.

Before counseling the students, the teacher consulted all the students’ erroneous questions during the semester and found that the students had more questions. Therefore, the knowledge point analysis revealed that the student’s number of points, counting units, and rate of knowledge reached the wrong question rate. 40.7%, and it is a mistake of 20 questions, which shows that this student has a big problem in the learning of the large number of cognitive units. To understand the cause of the student’s wrong question, the teacher first asked the student to fill in the digital sequence table and found that there was no problem with the digital sequence, but the number was confused with the counting unit. Then the student was asked to do some of the accumulated errors. The teacher found that the student had seen the wrong things more seriously and that the learning habits needed further training. After having an accurate position on the problem, the teacher conducted detailed guidance on the student’s solving problems, and arranged exercises for the problem, and then provided further guidance on the problems that occurred during the exercise. After a few days, the students were given a small number of questions for this knowledge point and encouraged the student to go home and use the Internet to perform intensive exercises on this knowledge point. To understand the effect of counseling, the school has made statistics on the incorrect question rate of this knowledge after the teacher’s counseling. It found that the wrong question rate of this knowledge point dropped to 8.3%, and only one question was wrong, since the system records the data of each student’s knowledge point, this method is applicable to each student’s knowledge point. Therefore, the “individualized” guidance under the support of digital campus system data becomes things that can be done.

2.2.2 Grasping the structure of knowledge is the basis of mathematics teaching

In addition to grasping the student’s mathematics learning situation, teachers’ understanding of the entire structure of mathematical knowledge is also important for teaching mathematics. Chaoyang Experimental Primary School is the birthplace of Ma Xinlan’s teaching thought. Ma Xinlan’s mathematics teaching

method attaches great importance to the formation of knowledge structure and emphasizes the establishment of basic concepts.

How to grasp the structure of mathematical knowledge? The following describes the related content of “numerical calculation” as an example:

In the current Chinese primary school mathematics curriculum, “operations” and its related series of contents are distributed in various grades of “number and algebra” fields. It mainly includes the calculation of natural numbers, the operation of decimal numbers, and the calculation of fractions. Different contents and different kinds of calculations have their own calculation rules. There are close links between different types of calculations, and at the same time, “numbers of operations” and “there is also a close connection between the understanding of numbers. By combing “operation” and its related content, students can deepen the understanding of the contents.

In the primary school curriculum, multiplication operations mainly include: integer multiplication, fractional multiplication, and fractional multiplication. They all have their own algorithms, but by analyzing the logic behind the rules, we can find the correlation between them. The following is a combination of examples to illustrate:

$$\begin{array}{r} 27 \\ \times 3 \\ \hline 81 \end{array} \quad \begin{array}{r} 27 \mid 00 \\ \times 3 \mid 00 \\ \hline 81 \mid 00 \end{array} \quad \begin{array}{r} 2.7 \\ \times 3 \\ \hline 8.1 \end{array}$$

$$\frac{2}{7} \times 3 = \frac{2 \times 3}{7} = \frac{6}{7}$$

Figure 2. An Example of Multiplication Operation

In the multiplication of integers, 27 times 3, the result shows 81 ones, so the 27 times 3 result is 81; 2700 times 3, 2700 represents 27 hundred, we first use 3 to multiply 27, get 81, and 81 represents 81 One hundred, so the final result is 8100; in the multiplication of fractions, 2.7 times 3, the decimal multiplication calculation method says, “The decimal multiplication is done according to the integer multiplication, and finally the size of the product is determined by the number of decimal places.” At this time, the 27 represents One-tenth of 27, 27 times 3 is 81, this 81 also represents 81 one-tenth, so the result is 8.1; the reason for the fraction multiplication is the same, the $\frac{2}{7}$ multiplication by 3, the fractional unit is $\frac{1}{7}$, we use 2 times 3 to get 6, This 6 represents 6, so the result is. We can easily find through the above analysis, multiplication of integers, decimals, and fractions. The result of multiplication represents the number of count units, and the count unit also performs the same multiplication operation, the number of count units, and the count the unit of two factors together determine the size of the result.

In the process of communicating the knowledge structure, the concept plays a vital role in understanding these basic concepts. Therefore, the concept of number is very important. The concept is

the basis for logical judgment. Ma Xinlan once said that “the correct problem-solving idea stems from the correct judgment of the quantitative relationship, and the correct judgment of the quantitative relationship comes from the correct establishment of the concept.” Concept is the basis of judgment and the basis for further development of knowledge. The school attaches great importance to the concept of teaching, the formation of the concept is an important aspect of development thinking, the correct understanding of the

concept, is the number of students to understand, calculation and problem-solving training.

After the initial formation of the concept, the students' understanding of the concept is often not in depth, and some are one-sided. Therefore, the basic concepts, especially the core concepts, must be used and trained in many aspects of knowledge (concepts) in the future. From the intrinsic relationship of knowledge, students must have a deeper understanding of the connotation of the basic concept and its essential significance.

Table 3. Table of elementary mathematics examples (58 lessons)

| No. | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|-----|------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------|---------------------------------------------------|
| 1 | Understanding "just as much" | Understanding "parts" | Understanding numbers within 10, 000 | Understanding multi-digit numbers | Meaning of Fractions | Multiplication of fractions |
| 2 | Size of numbers | A preliminary understanding of multiplication | Division with a remainder | Meaning of decimals | Units of fractions | Division of fractions |
| 3 | Relationship between the unit & parts | A preliminary understanding of multiplication | Two-digit multiplication by one-digit arithmetic | Nature of decimals | Thinking training for comparison of fractions' size | Formulation of circular area formula |
| 4 | A preliminary understanding of addition & subtraction | Understanding double | Preliminary understanding of fractions | Addition of decimals | Multiplication of decimals | Positive and negative proportions |
| 5 | Understanding 10 | Training of double | Preliminary understanding of decimals | Two-digit division | Division of decimals | Using proportions to solve problems |
| 6 | Understanding number between 11-20 | Using double to solve problems | Two-digit multiplication | Flexible pilot training for division problems | Using fractions to solve problems | Calculations combined training |
| 7 | Carrying addition within 20 | 6 methods to solving problems of multiplication & division | Continue addition & subtraction to solve problems | The law of multiplication operation | Numbers in letters | Graphics combined training |
| 8 | Subtractions of numbers within 20 with withdrawals | Training of 11 kinds of one-step problem solving | Training of multiple-solutions for one problem | Easy calculation of multiplication | Finding equal relationship training | Slightly complicated fractional problem solving |
| 9 | Understanding numbers within 100 | Area and the unit of area | Area and the unit of area | Sorting of Number | Using equations to solve problems | Diversified thinking training for problem-solving |
| 10 | Thinking training for addition and subtraction of 5 kinds of problem solving | Thinking training for solving problems of two-step | Formulating the area formula of rectangle and square | | Combined 2D graphics | |

2.3 Promote the student's development of ability

The school has been looking for ways and means to enable students to use knowledge as a vehicle to promote the development of their abilities and ultimately to develop people. As a mathematics teacher, letting students learn more and more wisely is the goal.

2.3.1 Pay attention to complete and concise thinking training to promote student development

It is well knowing that language is the outer shell of thinking. The completeness and conciseness of language reflect the

completeness and simplicity of thinking. Therefore, the school attach great importance to training students' language as a carrier to carry out complete and concise thinking training. Primary school is a crucial period for the formation of students' mathematics language. The school regards it as an important part of learning habits cultivation, and even as a key task in the first year of school. In the training process, the school mainly focuses on the following four points.

Train students to speak in full: Primary school students are younger, and their expressions are often more casual. To promote the development of student thinking, I asked students to be conscious of guiding their students to express their own ideas using words such as “because” and “so”. If students can use this logical way of mathematics to explain the cause and effect of things, they will reflect the students’ complete thinking.

Training students to express accurately: In expressing the relationship between quantities, mathematical language is often concise and accurate. We often say that “a word represents the level. When expressing the quantitative relationship, one word is more likely to appear, and one word is less accurate.” It may be difficult for students to be so precise in the process of learning. However, this is the direction in which we guide students and is our goal.

Train student to speak loudly: It is important to be able to be straightforward and strong. In the process of student expression, it is very important not only to train students to reason, to train their self-confidence, but also to create an atmosphere of overall expression. We have especially consciously created this atmosphere of loud voice from the first grade.

Training student to ask quality questions: The mathematics teaching is immersed in a rich world view, outlook on life, and values. Therefore, in the mathematics classroom, we must cultivate students’ scientific, rigorous attitude and spirit of seeking truth. The impact of learning mathematics on the students’ life is by no means taught by the knowledge of $1+1=2$. What matters is a kind of thinking, a judgment, an attitude.

2.3.2 Focus on flexible and diffuse thinking training to promote student development

The flexibility of problem solving embodies the students’ mastery of basic concepts and reflects students’ flexibility in thinking about such issues. Multi-angle analysis can often make multiple solutions to a problem. One solution to multiple solutions refers to a problem that guides students to think from different perspectives and finds relationships between different numbers to find different ways to solve problems. This kind of thinking is differentiating thinking, which is divergent thinking. From this we can see that many solutions to one question play an important role in cultivating students’ ability to develop divergent thinking. A variety of solutions can make the related knowledge communicate with each other, establish a variety of connections, and help overcome the shortcomings of the students’ problem-solving concepts and the single solution method. They can also make the students’ thinking in the best condition, inspire interest in learning, and help in thinking with flexibility and creativity.

If teachers develop students’ consciousness of analyzing problems from multiple angles, no matter what the problem, they can also achieve the purpose of promoting the development of students’ thinking. It seems that there are many ways to go about a

problem. The key is to grasp the characteristics of the problem and choose the appropriate method. You can choose the simplest and more familiar path. Through the above examples, we can easily see that through the design of this question, students are led to analyze the problem from multiple angles. The students’ thinking will be divergent from multiple angles. Such training can cultivate students’ flexibility and flexibility in problem solving. This inspires the students’ thinking and stirs up the waves to achieve the opposite effect. This is the flexibility of thinking.

The divergence of thinking also wants to illustrate with an example: This is also a method that the school often uses in the classroom. For example, the ratio of boys to girls is 5:3: By this condition, you can also tell which ratios, which scores, the number of boys in the class $5/8$ The number of boys in the class is $8/5$; The number of boys accounts for a difference of male and female student population is $5/2$; The number of female students accounts for a difference of male and female students $3/2$

Through the divergence of this question, students naturally combine scores, ratios, and divisions. The learning of one knowledge point is the study of many later knowledge. When the knowledge was studied, the window paper was smashed once and for all. The students’ thinking was like bamboo jointing. They were raised once and again. This is the flexibility and divergence of the thinking contained in the title. Based on many years of practical exploration, the school has published “Research on the combination of two kinds of thinking in primary school mathematics” and “Training of primary school mathematics thinking” and other related books, which have been impacting practice of Mathematics Education in Primary Schools across China.

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The Application of Flipped Classroom in Pathology Postgraduates' Experimental Technology Course

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Abstract: To cultivate and improve the theoretical level and experimental operation ability of experimental techniques for pathology postgraduates, a new teaching model of flipped classroom was implemented in the pathology postgraduate experimental technology course, and the differences between flipped classroom and traditional teaching modes were analyzed and compared. In the theoretical examinations and experimental skills examinations for the two groups of graduate students, the scores of pathology graduate students in the experimental group has been improved, and over half of the graduate students favor the flipped classroom teaching mode. The study found that flipping classroom teaching mode promoted and improved the application of theoretical knowledge and experimental skills of pathology graduates, and at the same time it promoted their interest in self-directed learning.

Key words: flipped classroom, pathology, postgraduate course

Introduction

According to the "Medical Program for Full-time Pathology and Pathophysiology Master Graduate Education" issued by the relevant medical department of the medical school, it is pointed out that full-time master-degree pathology and pathophysiology postgraduate students have mastered the professional foundation knowledge and skills of the discipline, familiar with the subject's research process, characteristics, experimental methods and techniques, and lay the foundation for future research work^[1]. The orientation of this training goal directly docks and cultivates the reserve strategy of scientific research talents, which reflects the importance of today's pathology postgraduate students participating in scientific research and mastering experimental methods and techniques.

1. The meaning of the Flipped Classroom

Flipped Classroom is a method of recording lectures and PPT presentations by using screen capture software. It was first used by two chemistry teachers in Woodland Park, Colorado, to help students make up lessons. It reversed with the traditional teaching model, through the learners to watch teaching videos before class, but in the classroom teachers and students exchanged discussions and completed homework, so as to obtain a good teaching effect^[2]. Since then, with the rapid development of Internet technology, flipped classroom has become one of the hot research topics of teaching reform. In flipped classroom,

teachers and students can use Internet devices (such as mobile phones, laptops, etc.) to complete the communication of knowledge, promote and encourage students to actively seek for their own learning methods, and exercise their ability to learn independently. In addition, flipped classroom makes students feel the joy of success, inspire students' interest in learning, promote the students' motivation to actively acquire knowledge, make the classroom atmosphere become more active^[3], cultivate and improve postgraduates' theoretical level and experimental operation ability.

2. The object and method

2.1 Research object

The postgraduate students from School of Medicine Pathology (2015) at Yanbian University were selected as the teaching object of this teaching reform and were randomly divided into two groups of 4 persons each, with a total of 8 persons. In the teaching process, the experimental group adopted the flipped classroom teaching mode; the control group adopted the traditional teaching mode. Both groups of students use the teaching materials of the People's Health Publishing House edited by Prof. Li Yulin, "Pathology (8th Edition)" and the "Molecular Pathology Biology Experimental Technology Guide" edited by Associate Professor Piao Ying-shi, and the teachers are the same. The study period began in September 2015 for a total of one semester. There are no significant differences between the two groups of postgraduate students in terms of gender, age, and previous academic performance.

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2.2 Research method

Pathology postgraduate students participate in theory and experimental courses through the Pathology Experimental Technology course. The experimental group used flipped classroom teaching mode for teaching, and the traditional teaching mode used for the control group [4]. Specifically, the implementation of the flipped classroom teaching process is reversed. Before the class, the postgraduate students watch the teacher to record and upload relevant teaching videos or materials in the QQ group or the WeChat group. At the same time, a certain number of assignments are arranged. Those who have not mastered the teaching part can watch it repeatedly. During the class, firstly postgraduate students discussed and analyzed their own problems in the learning process and discussed around the issues raised by postgraduate students. Everyone discussed and answered each other's questions. Finally, the questions that cannot be answered by the postgraduate students are answered by the teachers, so that the practical abilities of the graduate students can be fully utilized in the course teaching and experimental teaching [5-7]. The key to flipped classroom teaching mode is to create high-quality video, about 5-10 minutes of video. There was no difference between the experimental group and the control group in terms of teachers, teaching progress, and teaching content.

2.3 Evaluation method

After the completion of the teaching of pathology experimental technology courses, under the premise that the specific grouping information is not disclosed, the organization assessment teacher will examine the two groups of postgraduate students. The assessment methods mainly include theoretical examinations and experimental skills examinations. Finally, the results of the two teaching modes are evaluated according to the assessment results. The experimental pathology techniques such as "Organizing Drawing, Fixing, Embedding, and Immunohistochemistry" are listed in the experimental skill assessment, based on the degree of mastery ("hands-on", "operational steps" and "cannot complete the entire step") to perform skills assessment (take a 10-point system).

2.4 Statistical method

Data were analyzed using statistical software SPSS18.0. The results were expressed as (\pm s), and t-test was used for comparison between groups. $P < 0.05$ indicated that the difference was statistically significant.

3. Results

3.1 Comparison of scores of theoretical examinations between two groups

The test scores of the experimental group were (88.50 ± 0.6455) points, which was higher than that of the control group (82.50 ± 1.041 points). The difference was statistically significant ($P = 0.0027$). The results are shown in Table 1.

Table 1. The classroom teacher evaluates scores of theoretical examinations between two groups (\pm s, point)

| Group | No. | Scores | T | P-value |
|-------------------|-----|--------------------|-------|---------|
| | | | 4.899 | 0.0027* |
| Experiment | 4 | 88.50 ± 0.6455 | | |
| Control | 4 | 82.50 ± 1.041 | | |

3.2 Comparison of experimental skills test results between two groups

The scores of the experimental skills test found that skills in the experimental group were 9.125 ± 0.08539 points, which was higher than that in the control group (8.250 ± 0.06455 points). The difference was statistically significant ($P = 0.0002$). The results are shown in Table 2

Table 2. The classroom teacher evaluates scores of experimental examinations between two groups (\pm s, point)

| Group | No | Scores | T | P-value |
|-------------------|----|---------------------|-------|---------|
| | | | 8.174 | 0.0002* |
| Experiment | 4 | 9.125 ± 0.08539 | | |
| Control | 4 | 8.250 ± 0.06455 | | |

3.3 Evaluation of Effect of Traditional Mode and Flipped Classroom Mode

For the evaluation of various indicators, the effect of the experimental group was higher than that of the control group, with statistical significance ($P = 0.028$). The results are shown in Table 3.

Table 3. Evaluation of Teaching Effect of Traditional Mode and Flipped Class Mode (n, %)

| Item | Experiment Yes (%) | Control Yes (%) | χ^2 | P-value |
|---------------------------------------------------|-----------------------|--------------------|----------|---------|
| Improve pathological learning interests | 4(100.0) | 1(25.0) | 4.800 | 0.028* |
| Improve the ability to proactively solve problems | 3(75.0) | 0(0.0) | | |
| Improve the ability to explore unknown areas | 3(75.0) | 0(0.0) | | |
| Improve comprehensive analysis capabilities | 4(100.0) | 1(25.0) | | |
| Improve experimental skills | 4(100.0) | 1(25.0) | | |
| Develop autonomous learning capabilities | 3(75.0) | 0(0.0) | | |
| Develop teamwork skills | 3(75.0) | 0(0.0) | | |
| Teaching effect satisfaction | 4(100.0) | 1(25.0) | | |

4. Discussion

The flipped classroom teaching mode and the traditional teaching mode are mutually reversed. In the flipped classroom, the students “listen”, learn and watch the teaching videos under the course, and combine “doing homework” with the teachers and students in the class to interact and discuss ways to solve the problems. The learning effect is greatly improved^[8]. Since then, flipped classroom teaching has become one of the hot topics in teaching reform.

In terms of internalization and absorption of knowledge, the rote teaching mode and the traditional teaching mode are obviously different. The flipped classroom teaching model has been implemented not only completed the new paradigm of “learning first after teaching” but also effectively transferred the process of knowledge transfer from the classroom to outside of the classroom, and the process of internalization of knowledge shifted from the outside classroom to the classroom.^[9] In the flipped classroom mode, students watch the classic teaching micro-videos through class to complete online learning and can enhance learning through difficult-to-play viewing. This knowledge transfer process not only overcomes the boring and tedious nature of traditional classroom knowledge delivery, but also saves time. At the same time, teachers participate in the process of internalizing knowledge and the process of discussion and cooperation among students, helping students to digest and consolidate and integrate. So that both the teaching effect and learning effect produce a qualitative leap [8]. The application of flipped classroom teaching in pathology postgraduate experimental technology courses can better improve the interest of postgraduate students in learning pathology, actively solve problem-solving abilities, explore the capabilities of unknown fields, and comprehensive analysis and experimental skills to cultivate postgraduate students’ autonomous learning. The flipped classroom can also promote teamwork ability to help postgraduate students to better apply theoretical knowledge to practice and improve their professional experimental skills.

To sum up, the application of flipped classroom teaching in

the pathology postgraduate experimental technology course is helpful for improving the interest of graduate students in autonomous learning, promoting the application and practice of theoretical knowledge, and playing an important role in guiding and cultivating the experimental skills of graduate students.

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Application of Natural Childbirth Clinical nursing pathway in Improving the Effect of Obstetric Health Education

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Abstract: *Objective:* to explore the influence of clinical nursing pathwayway on improving health education effect in obstetric natural childbirth. *Methods:* use full double-blind method to divide the 96 natural parturients treated in our hospital during April 2016 to August 2017 into the control group (n= 8 cases) and the observation group (n=48 cases); the routine health education and the health education in clinical nursing pathway are given to them; the intervention effects of the two groups are evaluated. *Results:* the observation group is superior to the control group in negative emotion score, health knowledge mastery score and nursing satisfaction rate after intervention($P<0.05$). *Conclusion:* the clinical nursing pathwayway is used to give health education to natural parturients to improve the cognitive level, eliminate negative psychology and improve nursing satisfaction.

Key words: obstetrics department, natural childbirth, health education, clinical nursing pathwayway

Introduction

96 natural parturients are selected to accept the research; this research aims at analyzing the application effect of health education under clinical nursing pathwayway.

1. Data and Methods

1.1 General Data

96 natural parturients treated in the obstetrics department of our hospital are selected and used as research objects; they are divided into two groups by full double-blind method: in the control group, there are 25 primiparas and 23 multiparas, aged 21-36 years old; the average age is 28.6 ± 6.6 years old; the gestational weeks are 38-41 weeks; the average gestational weeks are 39.4 ± 1.2 weeks; there are 12 puerperae whose culture level is primary school and even below primary school; there are 20 puerperae whose culture level is middle school; there are 16 puerperae whose culture level is junior college and above junior college. In the observation group, there are 26 primiparas and 22 multiparas, aged 20-37 years old; the average age is 28.8 ± 6.3 years old; the gestational weeks are 39-42 weeks; the average gestational weeks are 40.3 ± 1.1 weeks; there are 11 puerperae whose culture level is primary school and even below primary school; there are 20 puerperae whose culture level is middle school; there are 17 puerperae whose culture level is junior college and above junior college. There was no significant difference between the two groups of baseline data ($P>0.05$).

1.2 Method

The control group: After admission, the health education is randomly and flexibly given to the puerperae.

Observation group: Apply the clinical nursing pathway to the health education of the puerperae, and the operation is as follows: (1) Formulate the nursing pathway table: After the puerperae's health needs are fully grasped, the head nurse and the senior nurses jointly formulate the clinical nursing pathway table, ask the obstetrician, the puerpera and the family members, modify and perfect the table. (2) Implement the health education: the vertical axis is the time and the horizontal axis is the main content of propaganda and education; the health education is carried out on the patients strictly according to the nursing pathway table: ① on the day of admission, the puerpera should be accompanied to finish various examinations; the related childbirth knowledge should be explained to the puerpera; the puerpera should be guided to grasp the fetal movement monitoring method and the deep breathing technique; the psychological state of the puerpera is evaluated, and the individual psychological persuasion is given; the maternity ward sign is informed of the puerpera^[1], and it is emphasized that once the colporrhagia occurs, immediately inform the medical staff. (2) On the day of parturition, strengthen the monitoring of vital signs. After the fetus is removed, the puerpera can urinate within 4 hours; after 24 hours, the puerpera is encouraged to carry out the off-bed activity; the puerpera is fed with food rich in nutrition and easy to digest; the perineum pad should be changed frequently; pay attention to personal hygiene; the correct

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breastfeeding method is explained to the puerperal; the role and importance of breastfeeding should be emphasized. (3) During the first day of childbirth to 1 day before discharge, the puerpera should continue to learn the breastfeeding method; the puerpera should be informed of the breast nursing knowledge; the change of the puerpera's emotions is observed and the psychological guidance should be given in time; instruct the puerpera to master the methods of baby bath, touching and so on. (4) On the day of discharge, give the guidance manual of discharge to the puerpera, including dietary guidance, exercise guidance, health guidance, neonatal feeding guidance, etc., and put on a regular hospital admission review.

1.3 Observation Indicators

①The anxiety self-rating scale (SAS) and depression self-rating scale (SDS) developed by Chinese-American professor Zung^[2-3] are used to evaluate the negative emotions of two groups. There are 20 items in both SAS scale and SDS scale; the boundary value of SAS is 50 while the boundary value of SDS is 53; the higher the score is, the more serious the negative emotions are.

②The acquisition state of health knowledge for the two groups is surveyed by the self-made questionnaire; the main contents of the health knowledge are nutrition supplement, sanitary cleaning, rest and exercise, neonatal feeding^[4]; the score of each item is 0-25; the full score is 100; the higher the score is, the higher the level of health knowledge mastery is.

③The nursing satisfaction degree of two groups is surveyed by the self-made questionnaire. The evaluation indexes are as follows: service attitude, environmental facilities, safety precautions, effectiveness of propaganda and education^[5-7]; there are 15 items and the full score is 100; the score between 80-100 means satisfaction; the score between 60-80 means general satisfaction; the score between 0-60 means dissatisfaction. The proportion of patients with satisfaction and general satisfaction is the total satisfaction rate.

1.4 Statistical Methods

According to the statistical analysis of SPSS19.0, the positive state measurement data is expressed in $\bar{x} \pm s$ and the t-value test is performed; the count data is expressed by the rate, and the chi-square test is performed. The difference has statistical significance with $P < 0.05$ as the evaluation criterion.

2. Results

2.1 Observation of Negative Mood Assessment Before and After the Intervention of the Two Groups

Before intervention, there is no significant difference between the negative emotion scores of two groups ($P > 0.05$). After the intervention, the SAS scores and SDS scores of the two groups decrease; the decrease degree of the control group is significantly lower than that of the observation group ($P < 0.05$); see Table 1.

Table 1. Comparison of SAS Scores and SDS Scores Before and After Intervention [$\bar{x} \pm s$, Score]

| Group | Number | SAS Score | | SDS Score | |
|-------------------|--------|---------------------|--------------------|---------------------|--------------------|
| | | Before intervention | After intervention | Before intervention | After intervention |
| Control group | 48 | 65.98±6.71 | 52.97±4.33 | 67.82±4.86 | 54.32±4.48 |
| Observation Group | 48 | 66.03±6.67 | 43.04±3.27 | 67.88±4.79 | 43.91±3.46 |
| t | - | 0.020 | 7.590 | 0.033 | 7.554 |
| P | - | >0.05 | <0.05 | >0.05 | <0.05 |

2.2 Observation of Two Groups of Health Knowledge Mastery Condition

The scores of individual health knowledge mastery degree

and total scores in the control group are lower than that in observation group ($P < 0.05$); see Table 2.

Table 2. Comparison of Scores of Health Knowledge Mastery Degree in Two Groups [$\bar{x} \pm s$, Score]

| Group | Number | Nutritional supplement | Sanitary cleaning | Rest and movement | Neonatal feeding | Total score |
|-------------------|--------|------------------------|-------------------|-------------------|------------------|-------------|
| Control Group | 48 | 17.81±2.24 | 17.42±2.36 | 17.14±2.28 | 17.63±2.31 | 70.02±4.67 |
| Observation Group | 48 | 22.81±1.76 | 22.46±1.58 | 22.35±1.54 | 22.78±1.21 | 90.14±2.97 |
| t | - | 7.157 | 7.757 | 8.245 | 9.618 | 16.256 |
| P | - | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |

2.3 Observation of the Nursing Satisfaction Degree of the Two Groups

The total nursing satisfaction rate is 81.25% in the control

group and 95.83% in the observation group. The difference between the groups is significant with the statistical significance ($P < 0.05$). See Table 3.

Table 3. Comparison of Total Nursing Rates Between Two Groups[n(%)]

| Group | Number | Satisfaction | General satisfaction | Dissatisfaction | Total satisfaction rate |
|-------------------|--------|--------------|----------------------|-----------------|-------------------------|
| Control Group | 48 | 16 (33.33) | 23 (47.92) | 9 (18.75) | 81.25 |
| Observation Group | 48 | 25 (52.08) | 21 (43.75) | 2 (4.17) | 95.83 |
| χ^2 | - | - | - | - | 5.031 |
| P | - | - | - | - | <0.05 |

3. Discussion

Due to the particularity of obstetric services, the requirement for health education is relatively high. The traditional mode of propaganda and education is difficult to meet the health needs of the puerperae; the randomness is strong and the omission is easy to occur; the professional level of different nursing staff is uneven; the content of propaganda and education is too random, and the nursing dispute is easily caused^[8-9]. How to improve the quality of propaganda and education of obstetric health care is the key problem of medical staff's thinking.

The clinical nursing pathway integrates the concept of underwriting management and is applied in the health care; it can not only regulate the operation of the nursing staff, but also can clarify the nursing content of each time period, ensure the programming and systematization of the healthy nursing personnel, break the traditional blindness management problem, improve the work efficiency, reduce the occurrence of error events and play an important role in the harmonious nurse-patient relationship^[10-12]. The results of this study show that the scores of negative emotion and health knowledge mastery degree in the observation group are better than those of the control group. It is shown that the health education under the clinical nursing pathway contributes to the enhancement of maternity health awareness, the improvement of cognitive level and the alleviation of psychological burden. There is significant difference between the two groups of total nursing satisfaction rates, mainly because the clinical nursing pathway changes the passive nursing to the active nursing, fully reflects the humanistic concern idea, under which the nurse-patient communication chance increases, so the satisfaction rate is higher in the observation group.

To sum up, the clinical nursing pathway has remarkable effect in the health promotion of natural parturients, which is worthy of popularization.

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Reflections on the Honesty and Trustworthiness Education for Undergraduates in Colleges and Universities

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Abstract: Being honest and trustworthy is the traditional virtue of the Chinese nation. Among the contemporary college students, most of the students have the lack of good faith, and the honesty and trustworthiness education in colleges and universities is also poor. Therefore, the paper aims at finding out the present situation and main reasons of the college students' lack of honesty and trustworthiness by explaining the connotation and significance of honesty and trustworthiness education for college students, then has a discussion about it, and finally puts forward some thoughts to solve the problem, which are of great significance to solve the problem of honesty and trustworthiness education of college students.

Key words: honesty and trustworthiness, education, college students

Introduction

Honesty and trustworthiness—as the traditional virtue of the Chinese nation since ancient times, are also the basic moral standards of citizens in the modern society with developed science and technology, and we need to be bound by it. As the basic moral standards, honesty and trustworthiness play an important role in the ideological and moral education of college students. In 2001, “courtesy and honesty” as the basic moral standards are shown in the *Outline of the Construction of the Citizen Ethics* issued by our country. In 2006, in Socialist Concept of Honor and Disgrace proposed by General Secretary Hu Jintao, “Be proud of honesty and trustworthiness, and be ashamed of giving up principles for profits” is one of the guidelines. In the socialist core values put forward in the 18th National Congress of the Communist Party of China, “patriotism, devotion, honesty and fraternization” are also mentioned. It can be seen that honesty and trustworthiness education has become an indispensable part of ideological and moral education. However, with the deepening of education, the problem of honesty and trustworthiness of college students is becoming more and more prominent; especially in the process of getting along with people and communicating with people, some college students often don't have honesty and trustworthiness. In order to solve the problem better, I will analyze and study it from the following aspects.

1. The Connotation and Significance of College

Students' Honesty and Trustworthiness Education

1.1 Connotation of College Students' Honesty and Trustworthiness Education

In ancient times there were some sayings about honesty and trustworthiness like “A man can't live without honesty and trustworthiness” and “A gentleman is a man who has honesty and trustworthiness”. The Chinese word “Cheng” was first found in Wen Gong 18th year of *Zuo Zhuan*, saying “Cheng zhe, shi ye”. What is the general meaning of honesty and trustworthiness in modern society? In a simple way, the so-called honesty and trustworthiness means insisting on seeking truth from facts, and on that basis, everyone can be honest and trustworthy, in other words, he can abide by his promise and make his own accord. Honesty and trustworthiness education is to make the educated realize the most basic requirement of honesty and trustworthiness, so as to foster the ability of college students to get along with people and distinguish between right and wrong, and finally to correctly guide college students to abide by their commitments, to be honest and to do things honestly. Therefore, honesty and trustworthiness education has become an indispensable part of college students' ideological and political education.

1.2 Significance of College Students' Honesty and Trustworthiness Education

The significance of college students' honesty and trustworthiness education in colleges and universities is composed of the following three points: firstly, it is conducive to the cultivation of the spirits of patriotism and loving their

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schools of college students. Honesty and trustworthiness education is to build good “Three Views” for college students; don’t have twisted ideas. Only in this way can students feel the society’s and school’s care and thought so as to cultivate the spirits of patriotism and loving their schools. Secondly, it is beneficial to help college students to set up ambitious and noble ideals. Since working on the education, as a successful teacher, my greatest role is to be able to “be based on students”, be good at guiding the students correctly and be diligent in finding out the defects of the students so as to shape the students and make the students succeed, which is the ultimate goal of education. Therefore, it is necessary to make right and positive guidance to the students in the honesty and trustworthiness education. This kind of education and guidance can help students to set up ambitious and noble ideals. Thirdly, the honesty and trustworthiness education is also beneficial to construct harmonious campus and harmonious society. According to the relevant investigation results, it can be seen that in colleges and universities, when students treat others with honesty and get along well with each other, the conflicts between them can be reduced effectively and a harmonious atmosphere can be created; then the occurrence of campus injury accidents can be reduced, which is beneficial to the construction of a harmonious society and a harmonious campus.

2. Current Situation of College Students’ Lack of Honesty and Trustworthiness

According to the analysis of relevant data, questionnaire and so on, the following results are obtained. The lack of honesty and trustworthiness of college students is mainly manifested in the following three aspects:

2.1 Current Situation of College Students’ Lack of Honesty and Trustworthiness in Study

Examination cheating is serious. The CET-4 and CET-6 are the most important tests in the college students’ examinations; many students are eager to pass them. But according to relevant survey data, many students will take some improper means in order to pass the exams. For example, they buy answers, use mobile phones to deliver answers, plagiarize their classmates’ answers and so on. Although schools have taken severe measures to combat cheating, there are still students who cheat in the exams. Their purpose is to be able to pass the exams.

Besides, in the ordinary small tests and the course examinations, some students have a fluke mind and carry on this kind of dishonest behavior. In recent years, with the gradual improvement of the database, it is found that some of the graduates have plagiarized phenomenon in the repetition rate check of graduation thesis. The above-mentioned behaviors are the expression of the lack of graduation thesis.

2.2 Current Situation of College Students’ Lack of Honesty and Trustworthiness in Life

When communicating with people, some students are not punctual and trustworthy. Without the knowledge of the classmates, some students use the relevant information of their classmates to make the “Campus Loan”, which causes some students to owe a huge amount of debt. Some students concoct a variety of reasons and lie to their teachers for their own purposes, or even . A small number of students, after graduation, default on student loans and delay the return. These dishonest behaviors have a negative impact on the students themselves, schools and society.

2.3 Current Situation of College Students in Employment

According to relevant data, the graduates have serious breach of contract during the signing season. Many graduates do not have the right view of employment and often find some kind of bridge job first while looking for a nice one. Some of the students will sign a company first as a backup; if they find a better company, they immediately scrap the contract. There are also some student who will go to the company to practise or work after signing the contract, but during the internship period, because of a variety of reasons, they may leave the company directly and even the basic procedures are not fulfilled. There are also a few students who have obtained a good job through their own efforts, but because of the various reasons like ideological consciousness, they will not check in after signing the contract. These dishonest behaviors will bring bad influence to the society, and also bring negative impact on the subsequent employment of the graduates.

3. Main Reasons for the Lack of Honesty and Trustworthiness of College Students

Through referring to the students’ questionnaires and relevant materials, the main reasons for the lack of honesty and trustworthiness of college students are as follows:

3.1 For their own reasons, the honesty and trustworthiness are not paid much attention.

According to the survey, many students don’t pay attention to honesty and trustworthiness. In most of the students’ eyes, being late, leaving early, breach of promise, defaulting on student loans, lying, breach of contract, etc. are not worth mentioning, because all of these problems are trifles in college students’ eyes. Because of the lack of own moral consciousness and the legal concept, most of the students suffer from their own future growth path.

3.2 For the family reasons, the family background of each student is different, and the family education is different.

In the modern society, most of the college students are the only children, the parents’ spoiling, unlimited tolerance and the lack of parents in the process of education cause the students to lack the sense of responsibility, have poor self-bearing ability and be selfish. Driven by the bad mentality, most of the students tend to do dishonest things.

3.3 For the school reasons

According to the conversation with classmates and related investigations, most students are not satisfied with the honesty and trustworthiness education as well as related activities carried out by the school. The reason is that the way of honesty and trustworthiness education is single without creation and there is less interaction, etc. Therefore, the participation of students is low, which directly leads a part of the college students not to grasp the significance of honesty and trustworthiness education. In addition, the supervision of the school is weak, especially in the aspects of college students' honesty and trustworthiness education; most schools do not have standards to measure the students' honesty and trustworthiness; after the students have problems in honesty and trustworthiness, they don't correct them in time. Finally, there exist many problems in honesty and trustworthiness for students.

3.4 For the reasons of the great social environment

As a result of the change of the individual values in the contemporary society, many people have no longer paid attention to the moral education, which leads to the lack of moral education, among which, the most serious is the lack of trust between people and even the mutual deception. The series of things will have a bad effect on the honesty and trustworthiness of the college students.

4. Thoughts on Strengthening Measures of College Students' Honesty and Trustworthiness Education

Through the analysis of the problem, in order to strengthen the honesty and trustworthiness education of the college students, several measures have been put forward: 1. Establish the honesty and trustworthiness system of college students, that is to integrate the honesty and trustworthiness into the evaluation of moral education of the college students; if there is cheating on the examination, the fraud of the paper, the counterfeiting of employment data, etc., all these things shall be recorded in the moral education evaluation. 2. Strengthen the honesty and trustworthiness education of college students, change the way of traditional education and introduce new teaching ideas. The college students are not educated in the traditional way, but educated in the way of combining the new and old ways. 3. Strengthen the propaganda; the propaganda should be made in

the school, and the parents of the students should actively cooperate; do both things so as to improve the effects of honesty and trustworthiness education of college students. 4. Be based on the students and play the role of college students themselves. Let the students participate in the honesty and trustworthiness education actively. The relationship of mutual supervision and influence should be formed between students and students, students and teachers, students and schools; let students have a sense of ownership so that students can realize the goal of honesty and trustworthiness education.

In conclusion, it is a long-term process to study the honesty and trustworthiness education of college students, and it is also a complicated process, which requires our cooperation and coordination in many aspects. The ultimate goal is to cultivate talents with high quality, high knowledge, honesty and trustworthiness in the socialist construction.

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Analysis of Risk Factors for Deep Venous Thrombosis in Patients with Advanced Tumor

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Abstract: Objective: To explore the risk factors of deep venous thrombosis in patients with advanced tumor and provide reference for clinical prevention and treatment. **Methods:** 100 patients with advanced tumor who developed deep venous thrombosis from March, 2013 to March, 2014 were selected as observation group. 100 patients with advanced tumor who did not develop deep venous thrombosis were selected as the control group. Risk factors of patients who developed deep venous thrombosis were analyzed, and the multivariate logistic regression analysis was done on risk factors. After 24 months of analyzing these patients, the survival rate of two groups was concluded. **Results:** The results of single factor analysis showed that the distant metastasis, central venous indwelling catheter, diabetes, infection, blood transfusion, platelet count of patients in two groups were more than 350×10^9 g/L, D dimer was less than 500 ug/dl and P is less than 0.05. According to multivariate logistic regression analysis, the distant metastasis (OR=7.382, transfusion therapy (OR=1.458)) and infection (OR=3.256) were the risk factors of deep venous thrombosis in patients with advanced tumor, $P < 0.05$; the mean survival time of the observation group was (10.8±2.4) months which was significantly shorter than that of the control group (16.7±3.1) months, $P < 0.05$. The survival rate for 12 months of observation group was significantly lower than the control group 68.0%, $P < 0.05$. After treatment, all patients were effective in 3 days; 70 patients were cured, among which the 12 patients was effective and 18 patients died; the total effective rate was 82.0%. **Conclusion:** There are many influence factors of deep venous thrombosis in patients with advanced tumor, such as the distant metastasis, transfusion therapy and infection; meanwhile, deep venous thrombosis has certain influence on the prognosis of patients with advanced tumor, so clinical health education and management should be strengthened; at the same time, prevention and treatment work should be done well.

Key words: Advanced cancer, deep venous thrombosis, influence factors, blood transfusion, infection, distant metastasis

Introduction

Deep venous thrombosis mainly means the venous drainage disorder disease caused by abnormal coagulation of blood in the deep vein, which generally occurs in lower limbs of patients. The detachment of thrombus can lead to pulmonary artery embolism, thus affecting the prognosis of patients. The relevant investigation shows that^[1] the incidence of deep venous thrombosis in patients with advanced malignant tumors is rising; the exact epidemiological data isn't available at present, and it has been reported that the disease is increasing, which may reflect the increased incidence of the disease, or may be due to the improvement of the clinical doctors' understanding of the disease and the improvement of clinical diagnosis level so as to reduce the number of missed diagnosis cases. The incidence of deep venous thrombosis in patients with advanced malignant tumors is higher than that of normal population. A study shows the correlation between malignant tumors and thrombosis, and the thrombosis is a common complication for patients with advanced malignant tumors.^[2] It is reported that^[3] about 20.0%

of patients with advanced malignant tumors can suffer from thrombi in the course of the disease, and the incidence is 5 to 6 times of that of patients with non-malignant tumors. The malignant tumor itself can cause deep venous thrombosis, because the tumor cells invade the blood vessel to cause vascular wall injury; meanwhile, the tumor presses the blood vessel to cause abnormal blood flow state, and the tumor cell also secretes various inflammatory mediators, thereby causing the body to be easily embolized. To further understand and grasp the relevant factors of deep venous thrombosis in patients with advanced malignant tumors, this paper has carried out a study on the patients to improve people's understanding of deep venous thrombosis, which is beneficial to clinical prevention and treatment, and the improvement the patients' prognosis.

1. Data and Methods

1.1 General Data

100 patients with advanced tumor who developed deep venous thrombosis from March 2013 to March 2014 in our hospital were selected as the study object and were regarded as

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the observation group; the occurrence areas were right lower limbs for 40 patients, left lower limbs for 40 patients, upper limb for 10 patients, and double lower limbs for 10 patients; there were 70 male patients and 30 female patients; these patients were among 42 to 78 years old and the average age was (60.1±5.7) years old; the types of diseases were gastric cancer for 30 patients, lung cancer for 30 patients, colon cancer for 20 patients, rectal cancer for 10 patients and other tumors for 10 patients. 100 patients with advanced tumor who didn't develop deep venous thrombosis at the same period treated in our hospital were selected as the control group; there were 76 male patients and 24 female patients; they were among 40 to 77 years old and the average age was (60.3±5.6) years old; the types of diseases were gastric cancer for 32 patients, lung cancer for 28 patients, colon cancer for 22 patients, rectal cancer for 12 patients and other tumors for 6 patients. All patients were confirmed by organizing operations with pathology and belonged to Phase III-IV. The prior coagulation dysfunction and blood diseases are excluded. The ages, types of diseases, gender and other information of patients in both groups were compared; $P > 0.05$ was comparable.

1.2 Methods

The study was conducted through reference to the patients' clinical treatment and inpatient information such as age, gender, PS score and complications. The diagnostic criteria of deep venous thrombosis are pain, distal edema of lower limbs caused by venous thrombosis or edema of upper clavicle area, and the tube cavity obstruction of deep vein or filling defect shown by color Doppler ultrasonic examination; all are confirmed by angiography. Clinical treatment: 0.1 ml/kg of low molecular weight heparin calcium are injected into the abdominal wall of the patient once every 12 hours for 10 to 40 days. Before

treatment, it is necessary to strictly observe whether the patient is bleeding and observe its coagulation function.

1.3 Observation Index

All patients accept follow-up visits for 24 months in the form of telephone and short messages, Wechat, etc. The risk factors of deep venous thrombosis in patients are analyzed, and the multivariate logistic regression analysis is made on the risk factors. The survival rate of two groups are counted. Evaluation of curative effects: recovery: after treatment, all clinical symptoms and signs of patients disappear completely, and the color Doppler ultrasonic examination shows that the tube cavity of deep vein is completely unobstructed; effective: after treatment, all clinical symptoms and signs of patients are improved. Color Doppler ultrasonic examination shows partial tube cavity of deep vein is unobstructed; ineffective: after treatment, all clinical symptoms and signs of patients are not improved, or even more severe^[4].

1.4 Statistical Method

Data are analyzed by SPSS 10.0 software and tested by t or χ^2 . Logistic regression analysis is performed on the factors of $P < 0.05$.

2. Results

2.1 Single Factor Analysis of Deep Venous Thrombosis in Patients with Advanced Malignant Tumors

The single factor analysis shows that the distant metastasis, central venous indwelling catheter, diabetes, infection, blood transfusion, platelet count of patients in two groups are more than 350×10^9 g/L, D dimer is less than 500 ug/dl and P is less than 0.05. See Table 1.

Table 1. Single factor analysis of deep venous thrombosis in patients with advanced malignant tumors n=100

| Factor | Observation Group | Control group | χ^2 | P |
|-------------------------|-------------------|---------------|----------|------|
| Age (years) | | | | |
| ≥ 70 | 50(50.0) | 48(48.0) | 0.04 | 0.84 |
| < 70 | 50(50.0) | 52(52.0) | | |
| Gender | | | | |
| Man | 70(70.0) | 76(76.0) | 0.45 | 0.49 |
| Female | 30(30.0) | 24(24.0) | | |
| PS Score | | | | |
| ≥ 2 | 20(20.0) | 14(14.0) | 0.63 | 0.42 |
| < 2 | 80(80.0) | 86(86.0) | | |
| Radiotherapy | | | | |
| Yes | 78(78.0) | 74(74.0) | 0.21 | 0.63 |
| No | 22(22.0) | 26(26.0) | | |
| Central venous catheter | | | | |
| Yes | 44(44.0) | 24(24.0) | 4.45 | 0.03 |
| No | 56(56.0) | 76(76.0) | | |
| Distant metastasis | | | | |
| Yes | 84(84.0) | 38(38.0) | 22.23 | 0.00 |

| | No | 16(16.0) | 62(62.0) | | |
|---------------------------------------|----|----------|----------|-------|------|
| Complication | | | | | |
| Coronary heart disease | | 34(34.0) | 38(38.0) | 0.17 | 0.67 |
| Hypertension | | 36(36.0) | 40(40.0) | 0.16 | 0.68 |
| Diabetes mellitus | | 48(48.0) | 20(20.0) | 8.73 | 0.00 |
| Chronic obstructive pulmonary disease | | 6(6.0) | 4(4.0) | 0.21 | 0.64 |
| Peripheral vascular disease | | 24(24.0) | 26(26.0) | 0.05 | 0.81 |
| Infection | | 44(44.0) | 12(12.0) | 12.69 | 0.00 |
| Blood transfusion | | | | | |
| Yes | | 16(16.0) | 4(4.0) | 4.00 | 0.04 |
| No | | 84(84.0) | 96(96.0) | | |
| D dimer >500 ug/dl | | 50(50.0) | 14(14.0) | 14.88 | 0.00 |
| Platelet >350×10 ⁹ g/L | | 20(20.0) | 4(4.0) | 6.06 | 0.01 |

2.2 Multiple Factors Analysis of Deep Venous Thrombosis in Patients with Advanced Malignant Tumors

According to multivariate logistic regression analysis, distant metastasis (OR=7.382), transfusion therapy (B=1.458)

and infection (OR=3.256) are high risk factors of deep venous thrombosis in patients with advanced tumor, $P < 0.05$; see Table 2.

Table 2. Multiple factor analysis of deep venous thrombosis in patients with advanced malignant tumors

| Multiple factor | B | SE | Wald | P | OR(95%CI) |
|--------------------|--------|-------|--------|------|---------------------|
| Distant metastasis | 2.012 | 0.672 | 9.475 | 0.00 | 7.382(2.061~25.144) |
| Blood transfusion | 1.114 | 0.549 | 3.658 | 0.00 | 1.458(1.242~2.002) |
| Infection | 1.185 | 0.583 | 4.682 | 0.01 | 3.256(1.072~9.897) |
| Constant | -4.864 | 1.352 | 18.468 | 0.00 | |

2.3 Comparison of Clinical Efficacy of Deep Venous Thrombosis in Patients with Advanced Malignant Tumor and survival time of Patients in Two Groups

The mean survival time of the observation group is (10.8±2.4) months, significantly shorter than that in the control group, (16.7±3.1) months, $t=10.64$, $P=0.00$. The 12-month survival rate of the observation group is 30.0%, significantly lower than that of control group, 68.0%, $\chi^2=14.44$, $P=0.00$. After treatment, all patients take effect within 3 days; 70 patients are cured well, 12 patients take effect and 18 patients die; the total effective rate is 82.0%.

3. Discussion

Since the correlation between malignant tumor and venous thrombosis was reported, malignant tumor with deep venous thrombosis has begun to attract the attention of relevant domestic scholars^[5]. There are also significant differences in occurrence rate of deep venous thrombosis for patients with advanced malignant tumors of different types and patients with malignant tumors in different phases. Deep venous thrombosis is a common complication for patients with advanced malignant tumors. It has been reported that^[6] the occurrence rate of deep venous thrombosis of different tumors is 70/100000 ~ 113/100000, of which about 66.7% is deep venous thrombosis and 33.3% is pulmonary embolism. It is reported that^[7] after patients with advanced malignant tumors develop deep venous

thrombosis, the survival quality decreases constantly and the survival time also decreases. The results show that the mean survival time of the observation group is (10.8±2.4) months, significantly shorter than that in the control group, (16.7±3.1) months, $P < 0.05$. The 12-month survival rate of the observation group is 30.0%, significantly lower than that of the control group, 68.0%, $P < 0.05$. This indicates that the survival time of patients with advanced malignant tumor who develop deep venous thrombosis is shorter than that of patients with advanced malignant tumor who don't develop deep venous thrombosis, which is similar to the results of related studies and reports.

Some researches show that the three factors of suffering from deep venous thrombosis are venous injury and slow blood flow and abnormal blood, and the factors of suffering from deep venous thrombosis for patients with advanced malignant tumors are more complicated; the formation of venous thrombosis needs the joint participation and effect of multiple risk factors, and it is also related to the course of the patient, disease types, etc.^[7]. The results of the study show that according to the single factor analysis, the distant metastasis, central venous indwelling catheter, diabetes, infection, blood transfusion, platelet count of patients in two groups are more than 350×10^9 g/L, D dimer is less than 500 ug/dl and P is less than 0.05; according to multivariate logistic regression analysis, distant metastasis (OR=7.382), transfusion therapy (B=1.458) and infection (OR=3.256) are high risk factors of deep venous thrombosis in

patients with advanced tumor, $P < 0.05$; the central venous indwelling catheter is commonly used in the chemotherapy for the advanced malignant tumor. A large number of studies show that the central venous indwelling catheter could increase the risk of deep venous thrombosis for patients. The incidence of catheter-related thrombosis is about 3.0% ~ 32.0%, and the incidence of catheter-related thrombosis in tumor patients is 66.0%^[9]. The mechanism of catheter-related thrombosis may be associated with vascular endothelial injury and tissue factor release of patients; in addition, the stimulation of the patients' vein input chemotherapy drug can also aggravate vascular wall damage for the patients, thereby increasing the venous thrombosis rate. For patients with much bleeding during or after the operation, transfusion therapy is generally required because there is more granular cell debris in the inventory blood and the viscosity is high, thus increasing the rate of thrombosis^[9]. In addition, surgical wound bleeding also activates the patients' local or systemic clotting system, and the hemostatic should be used after operation to avoid the increase of the occurrence rate of venous thrombosis for patients. It is reported^[9] that in breast cancer patients with negative lymph node biopsy, the occurrence rate of venous thrombosis is 1.0%, whereas in patients with breast cancer metastasis, the occurrence rate of venous thrombosis is 17.0%. Another study reports^[10] that malignant tumors can make the incidence of venous thrombosis increase by 6.7 times and the incidence of blood system diseases for patients with tumors is higher. In addition, it is reported^[11] the early period (6 days) of patients with sepsis is the high-incidence season of deep venous thrombosis; the incidence of deep venous thrombosis is still around 5 per cent despite accepting the treatment of anticoagulant drugs. This may be due to the release of a large amount of inflammatory cytokines, such as tumor necrosis factor and interleukin-1, in patients with advanced malignant tumors that are infected, so that the tumor necrosis factor can induce the activity of the procoagulant activity of monocytes and tumor cells in vitro, thereby activating the coagulation pathway and inducing venous thrombosis^[12]. Once the patients have been diagnosed as deep venous thrombosis, they need to be treated actively in case that the detachment of thrombus influences the prognosis. At the same time, it is also necessary to instruct the patients to stay in bed for rest, raise the patients' limbs, accelerate their blood backflow and massage the lower limbs to avoid the detachment of thrombus.

To sum up, there are many influence factors of suffering from deep venous thrombosis for patients with advanced malignant tumors, so management and intervention should be

strengthened, and the patients should be treated actively to improve their prognosis.

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Value Analysis of Immunohistochemical Method Applied to Detection of Non-small Cell Lung Cancer EML4-ALK Fusion Gene

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Abstract: *Objective:* To explore the value of immunohistochemical method (IHC) applied in the detection of non-small cell lung cancer (NSCLC) EML4-ALK fusion gene. *Methods:* The clinical data of 118 patients with NSCLC treated from July 2016 to July 2017 were analyzed. All patients accepted the detection of EML4-ALK fusion gene, they were divided into control group and research group according to the test methods; the former uses PCR method while the latter uses IHC method. The results of the two groups of EML4-ALK fusion genes and the diagnostic efficacy of IHC were compared. Results: The positive rate of EML4-ALK fusion gene in the research group was 13.55%, and there is no significant difference compared with the control group ($P > 0.05$). The positive rate of females in the research group and the control group was 14.70% and 11.76% respectively, higher than that of males; the positive rate of patients less than 60 years old was 17.50% and 13.75%, higher than that of patients more than 60 years old; the positive rate of metastasis of NSCLC was 18.51% and 14.81%, higher than that without metastasis; the positive rate of detection of low differentiated adenocarcinoma was 14.28% and 14.28%, higher than that of middle and high differentiated adenocarcinoma ($P < 0.05$). *Conclusion:* The detection of EML4-ALK fusion gene by IHC method for NSCLC patients has higher diagnostic efficiency, which can guide clinical drug treatment and has popularization and application value.

Key words: IHC, NSCLC, detection, EML4-ALK fusion gene

Introduction

Non-small cell lung cancer (NSCLC) belongs to a common type of malignant tumor. The incidence rate of non-small cell lung cancer (NSCLC) has been increasing gradually with the increase of adverse living habits, the increase of environmental pollution and other factors in recent years, which seriously threatens the health and safety of the patients. At present, for NSCLC patients, targeted drugs (TKIs, small molecule tyrosine kinase inhibitors) for EGFR (epidermal growth factor receptor) mutant molecular are used for treatment, making clinical treatment of NSCLC achieve significant progress^[1]. However, since TKIs often have primary or secondary drug resistance during the treatment process, the efficacy is poor. With the development of the study of molecular targeted therapy, EML4-ALK fusion gene was discovered at the first time in 2007. The genes were formed as the two genes of EML4 (echinoid microtubule-associated protein sample 4) and ALK (anaplastic lymphoma kinase) were fused with each other^[2]. By performing EML4-ALK fusion gene detection on NSCLC patients, the correlation between driving genes can be effectively displayed, thereby providing a reference basis for clinical personalized

treatment, prolonging the survival periods of patients at the most extent, and improving the survival quality of patients^[3]. In order to determine the value of EML4-ALK fusion gene in NSCLC patients by immunohistochemical method (IHC), the data of 118 patients with NSCLC were analyzed and reported as follows.

1. Data and Method

1.1 General data

The clinical data of 118 patients with NSCLC treated from July 2016 to July 2017 were analyzed, and the NSCLC patients confirmed by pathology and patients without accepting chemoradiotherapy before operation were not included. Patients with severe liver and kidney dysfunction and cognitive dysfunction are excluded. Among them, the sex ratio is 50:68, aged 28-79 years old; 80 patients were less than 60 years old; 38 patients were more than 60 years old; there were 4 patients with adenosquamous carcinoma, 10 patients with squamous carcinoma, 84 patients with adenocarcinoma and 20 patients with adenocarcinoma. There were 91 patients without lymphatic metastasis. There were 27 patients with lymphatic metastasis. Informed consents were signed by all patients, and the research programme was approved by the Medical Ethics Committee.

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Table 1. General Data

| Item | ($\bar{x} \pm s, n$) | |
|----------------------------|-------------------------|------------|
| Sex (n) | Man | 50 |
| | Female | 68 |
| Age(years) | | 56.82±5.19 |
| Classification of diseases | Adenosquamous carcinoma | 4 |
| | Squamous carcinoma | 10 |
| | Adenocarcinoma | 84 |
| | Adenocarcinoma | 20 |
| Lymphatic metastasis | Yes | 27 |
| | No | 91 |

1.2 Methods

All research objects are identified with EML4-ALK fusion gene, and the control group is given PCR method; the instrument is Biometra type PCR instrument; paraffin samples are taken 10-15 tablets; the thickness is 4-6 μ m; they are put into EP tube, and the sample RNA is extracted by centrifuge column. then the concentration and the purity of the RNA are detected, and RNA is used as a template to carry out reverse transcription to obtain the cDNA; Finally, ELE-ALK fusion gene is detected by Real-time PCR, and the results are recorded. The research group is given IHC method; the instrument is Roche Diagnostics VENTANA Benchmark XT automatic sectioning dyeing instrument, which is used to cut 4 μ m samples of coated white sheet for full-automatic staining, and the staining results are recorded under microscope.

1.3 Diagnostic Criteria^[4]

PCR method: RNA is positive: FAM signal amplification curve appears in the control hole, Ct <24; EML4-ALK negative: there is no FAM signal has no curve rising; EML4-ALK-positive: apparent amplification curve of reaction hole FAM signal, Ct <30;

EML4-ALK is negative: there was no amplification of the FAM signal in the reaction hole, Ct \geq 30. IHC method: positive: granular cytoplasm staining in tumor cells; negative: non-cytoplasmic staining of tumor cells, or weak detectable granular, diffuse, dot-like cytoplasmic staining in the background.

1.4 Statistical Method

The data of this study are statistically analyzed by SPSS7.0 statistical software, and the normal measurement data is represented by($\bar{x} \pm s$), and t-test is used between the two groups. The number of patients[n(%)] is used to indicate counting data; χ^2 test is used to indicate the comparison of rate between groups; $P < 0.05$ shows that there is a statistical difference.

2. Results

2.1 Comparison of two groups of EML4-ALK fusion gene detection results There is no significant difference between the positive rate of EML4-ALK fusion gene in the research group and that in the control group ($P > 0.05$). See Table 2.

Table 2. Comparison of two groups of EML4-ALK fusion gene detection results[n(%)]

| Group (n) | Positive | | Negative | |
|------------------------|------------------------|----------------|------------------------|----------------|
| | Number of patients (n) | Percentage (%) | Number of patients (n) | Percentage (%) |
| Control group (n=118) | 12 | 10.16 | 106 | 89.83 |
| research group (n=118) | 16 | 13.55 | 102 | 86.44 |

Note: Comparison of groups $P > 0.05$.

2.2 Comparison of the two groups of EML4-ALK fusion gene detection The positive rate of the detection for females in the two groups is higher than that for males; the positive rate of detection for patients less than 60 years old is higher than that for patients more than 60 years old; the positive rate of the detection of NSCLC with

metastasis is higher than that of NSCLC without metastasis; the positive rate of detection of low differentiated adenocarcinoma is higher than that of middle and high differentiated adenocarcinoma($P < 0.05$).

Table 3. Comparison of two groups of EML4-ALK fusion gene detection[n (%)]

| Item | Number of patients | Control Group | | Research group | | |
|------------------------------------------|------------------------|---------------|---------------|----------------|---------------|-------|
| | | Positive | Positive rate | Positive | Positive rate | |
| Different Sex | Man | 50 | 4 | 8.00% | 6 | 12.00 |
| | Female | 68 | 8 | 11.76 | 10 | 14.70 |
| Age | <6 years old | 80 | 11 | 13.75 | 14 | 17.50 |
| | \geq 60 years old | 38 | 1 | 2.63 | 2 | 5.26 |
| NSCLC metastasis | Yes | 27 | 4 | 14.81 | 5 | 18.51 |
| | No | 91 | 8 | 8.79 | 11 | 12.08 |
| Degree of adenocarcinoma differentiation | Low differentiation | 14 | 2 | 14.28 | 2 | 14.28 |
| | Middle differentiation | 74 | 6 | 8.10 | 10 | 13.51 |
| | High differentiation | 30 | 1 | 3.33 | 1 | 3.33 |

Note: intra-group comparison, $P < 0.05$.

2.3 IHC Diagnostic Efficiency The PCR detection method is considered to be a gold standard; the sensitivity, specificity,

positive predictive value and negative predictive value of IHC method were 83.33% (10/12), 94.33% (100/106), 62.50% (10/16), 98.03% (100/102) respectively.

Table 4. Diagnostic Efficiency of IHC Method [n(%)]

| IHC method | PCR method | | Total |
|------------|------------|-----|-------|
| | + | - | |
| + | 10 | 6 | 16 |
| - | 2 | 100 | 102 |
| Total | 12 | 106 | 118 |

3. Discussion

The traditional treatment forms of NSCLC are operation, radiotherapy, chemotherapy and so on. Through the in-depth clinical research, the medical technical level is continuously increased; molecular targeted therapy is gradually becoming the hot spot of clinical research, and has a certain therapeutic effect^[5]. It is important for drug-resistant populations to seek new targets due to the drug resistance of EGFR mutation molecule targeted drug therapy. With the development of EML4-ALK fusion gene in recent years, clinical NSCLC therapy can be treated for this target molecule, and the drug effect is significant. Researches show^[6] that IHC detection can effectively test the condition of EML4-ALK fusion gene, so as to guide the formulation of clinical treatment plan, promote the patients' curative effect and improve the prognosis quality.

In this study, there is no significant difference between the positive rate of EML4-ALK fusion gene in the research group, 13.55% and that in the control group. The positive rates of females in the research group and the control group are 14.70% and 11.76% respectively, higher than that of males; the positive rates of detection for patients aged less than 60 years old in the research group and the control group are 17.50% and 13.75% respectively, higher than that for patients aged more than 60 years old; the positive rates of detection of NSCLC with metastasis are 18.51% and 14.81%, higher than that of NSCLC without metastasis; the positive rates of detection of low differentiated adenocarcinoma in the research group and the control group are 14.28% and 14.28% respectively, higher than that of middle and high differentiated adenocarcinoma. The results of this study are similar to those of Jin Linfang, Qi Xiaowei, Lu Lei.^[7] The results indicate that IHC detection can effectively identify EML4-ALK fusion gene; in NSCLC patients, the positive rates of EML4-ALK fusion gene for female patients, patients aged less than 60 years old, patients with NSCLC metastasis and patients with low differentiated adenocarcinoma are higher than those of male patients, patients aged more than 60 years old, patients without NSCLC metastasis and patients with middle and high differentiated adenocarcinoma. The EML4-ALK fusion gene can be used for synthesizing ALK

fusion protein, and can promote signal conduction completion and carcinogenicity transformation through path of multiple molecular signals. The research indicates that the mechanism of fusion between ALK and EML4 is that the short arm of chromosome 2 has an intra-arm inverted position, resulting in the formation of fusion gene and the fusion is mainly between different exons of EML4 and ALK20 exons, and then different fusion types appear. The PCR method to identify the EML4-ALK fusion gene has high sensitivity and specificity, but because of the diversity of the EML4-ALK fusion types, there may be some unknown fusion types in addition to the common fusion type, which leads to a blind zone in the detection of PCR. Secondly, the PCR detection method is relatively complex, and the cost is high; and for the tissue specimen, the detection method has high requirements; as the detection of the variation type still has a blind area, the PCR detection method is difficult in clinical popularization.

In conclusion, the IHC method for NSCLC patients to test EML4-ALK fusion genes has higher diagnostic sensitivity, and is more economical, rapid and convenient than the PCR method, and can be popularized in clinic.

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The Nurses' Cognition and Countermeasures of the Causes of Neurosurgical Nursing Crisis

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Abstract: *Objective:* To study the cognitive status of neurosurgical nurses on the causes of nursing crisis and to develop scientific solutions. *Methods:* 54 neurosurgical nursing staff who worked in our hospital from January 2016 to December 2016 were selected as the objects of study; this paper analyzes the causes of neurosurgical nursing crisis, makes questionnaires to survey the degree of knowledge of the causes of nursing crisis, then develops a targeted crisis management plan and observe the cognitive level of nurses before and after intervention and the degree of satisfaction of patients. *Results:* ① With regard to the causes of neurosurgical nursing crisis, the order of the cognitive level of nursing staff is nursing quality (84.8%), nurses' professional level (73.7%), patient factors (59.26%), medical expenses (51.85%), nursing relationship (44.44%), ward management system (37.04%), human resources management (35.19 per cent); ② After the intervention, the cognitive rate of the causes of nursing crisis for nurses is significantly higher than that before intervention ($P < 0.05$). ③ After intervention, the satisfaction score of patient nursing is significantly higher than that before intervention ($P < 0.05$). *Conclusion:* The cognitive level of the causes of nursing crisis for neurosurgical nurses is generally low; thus personnel training should be strengthened; the related management system should be perfected; nursing quality can be optimized; the risk of nursing risks can be reduced as much as possible, and the safety of medical treatment for patients is guaranteed.

Key words: nurse, neurosurgery, causes of nursing crisis, cognition, countermeasure

Introduction

In this study, 54 neurosurgical nursing staff are studied to analyze their understanding of the causes of nursing crisis and provide basis for the formulation of crisis management plan, which are reported as follows.

1. Data and Method

1.1 General Data

54 neurosurgical nursing staff in our hospital are selected as research subjects. All nursing staff are female, aged 21-47 years old; the average age is (34.2 ± 12.4) years old; the working life is 1-17 years and the average working year is (9.2 ± 6.3) years. Title: there are 8 supervisor nurses, 16 nurse practitioners and 30 nurses. Educational background level: there are 6 graduating from technical secondary school, 20 from junior college, 28 from university and above. All nurses are informed of the research contents, agree and voluntary participate in the study.

1.2 Method

1.2.1 Methods of Investigation

Through consulting the data of previous years and combining with practical experience, the paper concludes that the causes of neurosurgical nursing crisis include: human resource management, ward management system, nurse

professional level (theory and clinical operation), patient factor, nursing quality, medical expense and nurse-patient relationship.

Self-designed questionnaires shall be assigned to each nursing staff by special persons, and these questionnaires shall be recycled after completion on the scene. The questionnaire consists of two parts: (1) Basic information of nursing staff: name, age, sex, professional title, degree of culture, working time, marriage, etc. (2) Understanding degree of the causes of neurosurgical nursing crisis. The first part of the content is filled according to the actual situation; and the answer of the second content is two options "Yes" and "No"; "Yes" indicates the perception of the cause of induction. 54 questionnaires are issued and 54 questionnaires are recycled and the recovery rate reaches 100.00%. Special persons are arranged to take charge of questionnaires; statistics of the cognitive rate of nursing crisis cause is made (cognitive nurse number/ total number).

1.2.2 Intervention Method

① Strengthen professional training: conduct regular training on nursing staff, organize them to study the knowledge and nursing points of specialized diseases, focus on explaining application methods and adverse reactions of various drugs, and guide each nursing staff to study technical skills of specialized instruments to improve their business level. Carry out safety knowledge lectures regularly, organize nursing staff to study relevant legal knowledge, and raise their awareness of safety

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protection by listing examples. In addition, special training should be carried out on their manners and quality, so as to guide the communication skills. ② Implement the human resources management: adopt the elastic system of staff shift arrangement, increase manpower in the key period, adopt the way of new-old collocation, make the human resources be applied optimally^[1]. ③ Formulate the ward management system: carry out reasonable layout on the neurosurgical ward, ensure the light and air, strengthen the management of the first aid medicine, the instrument and equipment, establish the check-in sign-in system^[2], the three-check seven-pair system, the aseptic operation system, and ensure the standardization of the nursing operation. ④ Make good health education: through the propaganda manual, oral explanation, video data, health lecture and other methods, carry out health education to patients, deepen the cognition level of diseases, guide the reasonable diet of patients, warn patients to rest on time, properly exercise, maintain regular and healthy living habits. ⑤ Carry out the safety assessment: evaluate the patients' consciousness, spirit and intelligence level, analyze the risk factors that may cause adverse events, and formulate preventive measures, ensure the full penetration of the evaluation procedures throughout the medical process, and effectively provide guarantee for patients' safety. ⑥ Create a good nurse-patient relationship: communicate more with patients, think at the angle of the patient, care and sympathize patients, obtain the trust, evaluate the psychological state of patients when communicating with the patients, give the individualized psychological guidance scheme, guide patients to learn the emotional self-regulation method, help them stay positive and optimistic, do well the family work, encourage them to participate in the nursing work, let the families take care of the patients and give them emotional and life support, improve the clinical degree of adaptability of patients, and shorten the patients' recovery time as much as possible. With respect to the patients with economic hardship, the medical expense reimbursement system and the social treatment channel can be adopted so as to help the patients to

reduce the economic pressure. ⑦ Pay attention to the details of nursing: clean rooms in time, change bedding, strengthen basic nursing, make skin clean nursing and body position nursing and avoid forming pressure sore. The postoperative ECG monitoring ensures the liquidity of each drainage pipeline; the prevention and nursing of complications such as incision infection, urinary system infection and severe pain should be done well to effectively improve the physiological comfort level of patients.

1.3 Observation Indicators

① Record the cognitive rate of nursing crisis before and after the intervention.

② Before and after the intervention, 150 patients or family members are extracted to conduct satisfaction degree investigation. The investigation contents include: service attitudes, communication affinity, operation skills, risk management, security and confidence; each score is 0-20, and the full score is 100; the higher the score indicates, the higher the patients' satisfaction degree is.

1.4 Statistics Methods

Based on the statistical analysis of SPSS19.0, the normal counting data is expressed by the rate and made the chi-squared test; the measurement data is expressed by $\bar{x} \pm s$ and made the test of t-value; the difference is of statistical significance the assessment criteria is $P < 0.05$.

2. Results

2.1 Analysis of cognitive situation of causes of neurosurgical nursing crisis for nursing staff before and after intervention

With regard to the seven causes of neurosurgical nursing crisis, 54 nursing staff have the highest cognition level of nursing quality and the lowest cognition level of human resource management. The cognitive rate of various factors after intervention is significantly higher than that before intervention ($P < 0.05$). See Table 1.

Table 1. Comparison of cognitive rate of causes of neurosurgical nursing crisis for nursing staff before and after intervention[n(%)]

| Time period | Number of cases | Human resources management | Ward management system | Professional level of nurses | Patient Factors | Nursing quality | Medical expenses | Nurse-patient relationship |
|---------------------|-----------------|----------------------------|------------------------|------------------------------|-----------------|-----------------|------------------|----------------------------|
| Before intervention | 54 | 19 (35.19) | 20 (37.04) | 38 (70.37) | 32 (59.26) | 44 (81.48) | 28 (51.85) | 24 (44.44) |
| After intervention | 54 | 46 (85.19) | 48 (88.89) | 53 (98.15) | 51 (94.44) | 53 (98.15) | 50 (92.59) | 51 (94.44) |
| χ^2 | - | 28.169 | 31.129 | 15.708 | 18.789 | 8.199 | 22.339 | 31.811 |
| P | - | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |

2.2 Analysis of nursing satisfaction degree before and after intervention of patients

After intervention, the patients' nursing satisfaction index

score and total score are significantly higher than those before intervention ($P < 0.05$), and see Table 2.

Table 2. Comparison of nursing satisfaction degree scores of patients before and after intervention [$\bar{x} \pm s$, score]

| Time period | Number of cases | Human resources management | Ward management system | Professional level of nurses | Patient Factors | Nursing quality | Medical expenses |
|---------------------|-----------------|----------------------------|------------------------|------------------------------|-----------------|-----------------|------------------|
| Before intervention | 150 | 15.31±2.54 | 14.13±2.61 | 14.06±2.38 | 14.11±2.27 | 14.08±2.42 | 71.43±4.62 |
| After intervention | 150 | 19.02±0.87 | 18.95±0.93 | 18.87±1.01 | 18.93±0.89 | 18.94±0.85 | 94.48±1.35 |
| t | - | 16.924 | 21.306 | 22.785 | 24.211 | 23.206 | 58.652 |
| P | - | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |

3. Discussion

There are some obstacles in language, consciousness and limb activity of neurosurgical patients. During the treatment period, a number of emergency events are easy to occur, thus leading to medical dispute^[4]. A large number of studies confirm^[5-7] that the nursing crisis identification ability and comprehensive treatment ability of nurses will have a direct impact on the physical and mental health and prognosis of patients. However, most of the neurosurgical nursing staff are young, lack of professional knowledge and work experience and it is difficult to cope with emergency events, so there is a need to take certain interventions to solve the nursing crisis to ensure the safety of patients during the treatment of neurosurgical patients^[8].

Through the investigation and analysis, the cognition level of nurses on the causes of neurosurgical nursing crisis is low; in particular, the cognitive rates of human resources management, ward management and nurse-patient relationship is less than 50%. Based on this, the institute has formulated the targeted crisis management scheme: first, professional training of nursing staff is carried out; the operational ability of the nursing staff is improved, and the crisis accidents should be effectively solved in time; secondly, we should strengthen the management of human resources and wards and ensure the normality of the work order by arranging staff shift scientifically and improving relevant system; once again, the safety assessment can master the basic condition of the patients and ensure the effectiveness of the treatment plan; finally, health education, detail nursing, creation of nurse-patient relationship not only can satisfy the patients' multi-level requirements, but also can reduce occurrence probability of the risk events. After intervention, the cognitive rate of nursing staff and satisfaction score of patients increased, which proves that targeted crisis management plays an important role in improving medical service quality.

In conclusion, there are many risk factors of neurosurgical nursing; the cognition level of nurses and the operational level of business must be improved, and quality nursing services can be provided for patients, so as to promote the early rehabilitation of patients.

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Evaluation of the Safety of Laparoscope in Radical Resection for Colorectal Cancer

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Abstract: *Objective:* To explore the therapeutic effect of conventional laparotomy and laparoscopic radical resection for colorectal cancer. *Methods:* 62 patients with colorectal cancer who were admitted to our hospital from January 2015 to June 2017 were selected as the objects of study. They were divided into two groups according to the operating methods of patients; in the control group, 31 patients were treated with laparotomy radical resection for colorectal cancer; in the experimental group, 31 patients were treated with laparoscopic radical resection for colorectal cancer; the efficacy and safety of the two groups were evaluated. *Results:* ① The operation indicators and postoperative recovery time in the experimental group were superior to those in the control group ($P < 0.05$); ② the levels of postoperative inflammatory factors in the experimental group were significantly lower than those in the control group ($P < 0.05$); ③ the postoperative hormone levels in the experimental group were significantly higher than those in the control group ($P < 0.05$); ④ the incidence rate of complications in the experimental group was significantly lower than that in the control group ($P < 0.05$). *Conclusion:* The risk of radical operation of laparoscopic colorectal cancer is low; the damage to the body is small; there are few complications and its safety is high; it is an effective means for the treatment of colorectal cancer, which is worthy of reference.

Key words: Colorectal cancer, laparotomy radical resection for colorectal cancer, laparoscopic radical resection for colorectal cancer, safety

Introduction

Colorectal cancer is a common malignant tumor disease of digestive tract, whose fatality rate is very high^[1]. Radical operation of early focus is the main means to save the patients; traditional treatment adopts laparotomy; although it can achieve certain effect, but the operation wound is large. After operation, various complications can be easily induced, and the required recovery time is longer^[2]. With the introduction of the concept of minimally invasive surgery, minimally invasive techniques such as laparoscope have developed rapidly and are gradually applied to surgical treatment. In order to compare the safety of traditional laparotomy and laparoscopic radical resection for colorectal cancer, 62 patients with colorectal cancer were studied. The specific reports are as follows:

1. Data and Methods

1.1 General Data

Sixty-two patients with colorectal cancer treated by our hospital were selected as objects of study and grouped according to the surgical treatment protocol adopted by the patients; in the control group, 17 males and 14 females, aged 35-64 years old, with an average (44.4±12.3) years old were treated with laparotomy radical resection for colorectal cancer.

In the experimental group, 18 males and 13 females, aged 36-65 years old with the average (49.9±12.1) years old were treated with laparoscopic radical resection for colorectal cancer. There was no significant difference between the two groups of baseline data ($P > 0.05$).

Inclusion criteria: ① Clinical symptoms meet the relevant diagnostic criteria in *Digestive System Tumor Pathology and Genetics*^[3] were found in[3]; ② it is confirmed by operation and pathological examination; ③ the patients are informed and consent.

Exclusion criteria: ① Other digestive system diseases such as intestinal obstruction are combined; ② serious traumatic diseases are combined; ③ there is coagulation dysfunction; ④ there is abdominal operation history; ⑤ there are surgical contraindications.

1.2 Methods

Control group: After general anesthesia of patients, an incision is made in the middle of the lower abdomen; the length is 10cm; the abdominal cavity is opened and the diseased tissues are removed; the lymph nodes are cleaned; the Intestinal anastomosis is performed, the incision is sutured, and the drainage tube is retained.

Experimental group: Laparoscopic radical resection for rectal cancer is adopted; after general anesthesia for patients,

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puncture the upper margin of the umbilical cord, fill in carbon dioxide gas, and create artificial pneumoperitoneum. Different surgical procedures are selected according to the position of tumors: ① For patients with ascending colon cancer, caecum cancer, colon hepatic carcinoma, right hemicolectomy is adopted. The patients take the supine position with low head and high foot; at first a small incision at the lower margin of the umbilical cord is made; the length is 10mm; the laparoscope is placed via incision; then a puncture opening is made at the places 4cms away from the left and right sides of the umbilical cord and the pubic symphysis; then the 5cm puncture cannula is inserted and the surgical instruments are put into it. The right junction mesentery is cut to the root part by an ultrasonic knife, so that the colon blood vessel is fully inflated; the root of the blood vessel is closed by the absorbable blood vessel clamp and is cut off, dissociating colon transversum and colon ascendens; the omentum majus is cut off longitudinally from the break position of colon transversum; the incision is made in right upper quadrant via rectus abdominis; the length is 3-6cm; the intestinal canal in the lesion segment is extracted and cut off; the anastomosis is performed in vitro, and the incision is sewed up by layer; then the pneumoperitoneum is created again; the mesentery hiatus is sewed and the indwelling drainage tube is put. ② For patients with the colon splenic carcinoma and carcinoma of descending colon, left hemicolectomy reduce is adopted to treat. The patients are instructed to take the bladder lithotomy position with low head and high foot; after an incision is made in the lower edge of the umbilicus and the laparoscope is put into it, the operation hole is made at the right lower abdomen Macs point and the position 4-5cm next to the right umbilicus. The left half mesocolon is cut by an ultrasonic knife, dissociating left transverse colon and the colon spleen area, so that the left ureter is fully inflated; the side abdominal wall and the pelvic lymph tissue are cleaned up to the upper end of the rectum; an incision is made in the left side of the the abdomen; the length is 3-5cm; the intestinal canal in the lesion segment is extracted and cut off; the anastomosis is performed in vitro; the incision is sewed up and the indwelling drainage tube is put. ③ Anterior resection of rectum (Dixon) is adopted for middle and low rectal cancer patients. The puncture method is the same as the left hemicolectomy; after laparoscopic and surgical instruments are put, the peritoneal incision is performed at the junction of the mesentery and the pelvic cavity, and the free left lower side peritoneum, the diaphragm membrane and the mesorectum were dissected at the junction of the junction mesentery and the pelvic cavity, dissociating lower left

peritoneum, mesosigmoid and mesorectum; the rectal wall is baring at the position 5cm away from the lower edge of tumor; the Endo-GIA stapler is used to cut the intestinal canal at the position; an incision is made in the left lower quadrant; the length is about 4cm; the intestinal canal is taken out; the intestinal canal is cut at 10cm on the upper edge of the tumor; the proximal end is inserted into the anastomat; the incision is sewed up by pouch; the intestinal segment is brought into the abdominal cavity; the pneumoperitoneum is created again and the rectal low-level anastomosis is performed. ④ For ultra-low rectal cancer patients, the lower abdominal perineal combined rectal excision (Miles operation) is performed. The puncture method is the same as Dixon operation. After using the ultrasonic knife to dissociate the rectum, an incision is made in the left lower abdomen; the length is 4cm; the intestinal canal is taken out and cut; the anal side of the anus is also removed from the abdominal cavity, and the anus is removed by the routine procedure, and the rectum is pulled out from the perineum; the fistulation is adopted in the broken end.

1.3 Observation Indicators

① Amount of bleeding, operation time, postoperative exhaust time, feeding time and hospital stays are recorded in the two groups.

② The two groups of inflammatory factors like interleukin-6 ($IL-6$), C-reactive protein (CRP) and tumor necrosis factor- α ($TNF-\alpha$) are detected.

③ Gastrin (MTL) and gastrin (GAS) are detected in two groups of gastrointestinal hormones.

④ Complications occurred in the two groups are made statistics.

1.4 Statistical Methods

According to the statistical analysis of SPSS19.0, the normal measurement data is expressed with $\bar{X} \pm s$; the t-value test is performed; the count data is expressed by the rate, and the chi-square test is made. There is statistics significance in difference with $P < 0.05$ as the evaluation criterion.

2. Results

2.1.1 Two groups of operation and postoperative recovery index observation

The bleeding volume in the control group is significantly higher than that in the experimental group; the operation and postoperative exhaust, feeding and hospital stays are significantly longer than those in the experimental group ($P < 0.05$), see Table 1.

Table 1. Comparison of Two groups of operation and postoperative indicators[$\bar{X} \pm s$]

| Group | Number | Amount of bleeding in operation (ml) | Operation time (min) | Postoperative exhaust time (d) | Eating time (d) | Hospital stay (d) |
|--------------------|--------|--------------------------------------|----------------------|--------------------------------|-----------------|-------------------|
| Control group | 31 | 138.29±21.64 | 179.83±22.85 | 2.73±1.13 | 5.58±3.69 | 15.14±6.33 |
| Experimental group | 31 | 73.62±10.61 | 117.69±15.27 | 1.69±0.84 | 4.01±1.93 | 9.94±5.47 |
| t | - | 14.940 | 12.589 | 4.113 | 2.122 | 3.461 |
| P | - | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |

2.2 Observation of the changes of inflammatory factors before and after the two groups of surgical treatment

The levels *IL-6*, *CRP* and *TNF-α* in the two groups are similar before operation ($P > 0.05$); the levels of

inflammatory factors in the two groups go up after operation; the rising level of each index in the control group is significantly higher than that in the experimental group ($P < 0.05$). See Table 2.

Table 2. Comparison of two groups of inflammatory factors before and after operation[$\bar{X} \pm s$]

| Group | Number | <i>IL-6</i> (ng/L) | | <i>CRP</i> (mg/L) | | <i>TNF-α</i> (ng/L) | |
|--------------------|--------|--------------------|---------------|-------------------|---------------|---------------------|---------------|
| | | Pre-operation | Postoperation | Pre-operation | Postoperation | Pre-operation | Postoperation |
| Control group | 31 | 8.49±4.35 | 12.73±5.72 | 6.27±2.98 | 18.46±5.56 | 36.29±10.74 | 43.82±13.63 |
| Experimental group | 31 | 8.56±4.51 | 23.73±9.15 | 6.25±2.95 | 43.72±12.34 | 37.08±11.12 | 60.73±18.82 |
| t | - | 0.062 | 5.676 | 0.027 | 10.391 | 0.285 | 5.353 |
| P | - | >0.05 | <0.05 | >0.05 | <0.05 | >0.05 | <0.05 |

2.3 Observation of changes of gastrointestinal hormones before and after the two groups of surgical treatment

There is no significant difference in *MTL* and *GAS* of the two groups before operation ($P > 0.05$). After the operation,

the levels of *MTL* and *GAS* in the two groups decrease; the decline degree of the control group is more than that in the experimental group ($P < 0.05$). See Table 3.

Table 3. Comparison of gastrointestinal hormone levels between two groups before and after operation[$\bar{X} \pm s$, Pg/ml]

| Group | Number | <i>MTL</i> | | <i>GAS</i> | |
|--------------------|--------|---------------|---------------|---------------|---------------|
| | | Pre-operation | Postoperation | Pre-operation | Postoperation |
| Control group | 31 | 83.75±14.27 | 71.63±9.42 | 231.97±37.86 | 201.64±24.63 |
| Experimental group | 31 | 83.94±14.16 | 56.86±7.38 | 233.26±36.34 | 161.37±17.48 |
| t | - | 0.053 | 6.872 | 0.137 | 7.426 |
| P | - | >0.05 | <0.05 | >0.05 | <0.05 |

2.4 Observation of postoperative complications of the two groups

The incidence of complications in the control group is

32.26%, which is significantly higher than that in the experimental group (9.68%) ($P < 0.05$); see Table 4.

Table 4. Comparison of incidence of complications in both groups[n (%)]

| Group | Number | Infection | Stomal leak | Uroschisis | Intestinal adhesion | Total incidence |
|--------------------|--------|-----------|-------------|------------|---------------------|-----------------|
| Control group | 31 | 5 (16.12) | 1 (3.23) | 3 (9.68) | 1 (3.23) | 32.26 |
| Experimental group | 31 | 2 (6.45) | 0 (0.00) | 1 (3.23) | 0 (0.00) | 9.68 |
| χ^2 | - | - | - | - | - | 4.769 |
| P | - | - | - | - | - | <0.05 |

3. Discussion

Colorectal cancer is one of the gastrointestinal tumor diseases that threaten people's life safety. There aren't obvious symptoms; when the focus invades intestinal mucosa, patients will have abnormal stool symptoms like increased defecation times and mucous stool. If due attention is not given, the disease develops to the middle and late stage, and the patients will suffer from general symptoms and eventually die by the proliferation of cancer cells^[4]. The aetiological agent of colorectal cancer is not yet completely clear, but it is widely believed that it has a certain relationship with diet habit, genetic factor, chronic inflammatory stimulus, virus infection, immune dysfunction, etc.^[5-6]

The laparotomy is praised as the gold standard for the treatment of benign and malignant diseases of colorectal cancer by medical field^[7]. In 1990, Jacobs first successfully performed laparoscopic right hemicolectomy and opened a new direction for the treatment of colorectal cancer^[8]. After more than twenty years of reform, the laparoscopic technique has been perfected and been widely used in the treatment of clinical diseases. However, there are still some disputes about the safety of the application of colorectal carcinoma. Our hospital conducts a study in it; the results of the study show that the amount of bleeding and the operation time in the experimental group are less than those in the control group, which was mainly due to the small incision of the laparoscopic operation; the structure of the abdominal cavity under the direct view of the laparoscope can be observed clearly; in order to avoid damaging the local tissue during the operation, the intraoperative amount of bleeding is small. The focus can accurately be positioned by using laparoscope, which is beneficial to shortening the operation time. The operation is a strong stressor. A large number of studies confirm^[9-10] the level of inflammatory mediators in serum will change significantly after surgical trauma. In this study, both groups of post-operative inflammatory factors increase, but the ascensional range in the experimental group is small, suggesting that laparoscopic surgery is lower in body damage. Because of the direct traction of the digestive tract during the operation, it is bound to have some effect on the digestive function. In this study, the levels of gastric motility and gastrin in the experimental group are higher than those in the control group. This is mainly because the scope of laparoscopic surgery is clear, which can reduce the traction of the local tissue and is beneficial to the recovery of blood circulation; thus the exhaust time and the feeding time of the experimental group are shorter. There are

significant differences between the two groups of complication rates and hospital stays, which suggests that laparoscopic surgery can reduce the risk of complications, relieve the pain of the patients and promote patients to recover their health.

In conclusion, laparoscopic resection of colorectal cancer can shorten the recovery time of patients, and the operation safety is high, which is worthy of popularization.

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Study of Current Situation of Agri-tech Transfer in an Academy of Agricultural Sciences in China

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Abstract: Agri-tech achievements transformation plays an important role in agriculture in order to realize their value. Taking the Guangdong Academy of Agricultural Sciences in China as an example of agricultural research institutes, this paper mainly introduces the transformation model. Moreover, the measures adopted by the academy and the results achieved were introduced, and several suggestions for furthering improving the transformation of agri-tech achievements were put forward. This article hopes to provide some references to the researchers and governments in researching and implementing the transformation of agricultural scientific and technological achievements all over the world.

Key words: Chinese agriculture, Agricultural Science and Technology Achievement Transformation, agri-tech transfer, agricultural extension, suggestions

Introduction

Agricultural scientific and technological achievements (agri-tech) transformation is an activity of experimentation, demonstration of science and technology, training, and promotion of valuable scientific and technological achievements to form new products, new methods, and development of new industries (Li et al., 2016). The transformation of agricultural scientific and technological achievements is the intermediate link of the transformation of new-type science and technology into economic benefits. It is in fact a process in which new types of science and technology are transferred from the production of the results to the demand of the results (Zhang, 2007). Improve the transformation rate of agricultural science and technology achievements, so that the new agricultural technology has a real economic and social benefits, and can better meet the farmers' needs for new varieties and new technologies (Gou et al., 2016; Zhang et al., 2011). Since 2001, China has established a special plan for the "Transfer Fund for Agricultural Science and Technology Achievements" to promote the transformation and application of scientific and technological achievements (Zhang, 2014).

In the process of transforming agri-tech in China, the transformation has always been a result of performance factors such as long conversion cycles, asymmetric information, uneven quality of outcomes, difficult evaluation of outcome values,

inadequate contractual levels, and institutional constraints difficulties (Zhang, 2006; Yang et al., 2016). It is precisely because of the many hot spots and difficulties in the transformation of agricultural scientific and technological achievements, as well as its significance in the development of agriculture and rural economy, attracting a large number of scientific research personnel to conduct research and practice in this field. Researchers (Long et al., 1980; Liu, 1985) in the 1980s studied the urgency of transforming agricultural scientific and technological achievements into social productivity. They believe that the transformation of agricultural scientific and technological achievements is a key aspect of scientific and technological innovation activities, which largely determines the success or failure of agricultural innovation and development strategies. It is worth noting that the value of scientific and technological achievements intangible assets is often highly time-sensitive. If they cannot be converted into productive forces in time, their value will quickly devalue or even completely lose value if they are replaced by new technologies.

There are four widely used Agri-tech transfer approaches in China including government-led agri-tech transformation, Agri-tech Promotion Station led agri-tech transformation, agricultural Leading-enterprises led agri-tech transformation, and agricultural research institutes led agri-tech transformation (Liang, 2016). And there are some other agri-tech transfer patterns which are mixed with former mentioned patterns.

In this paper, the agricultural research institutes led

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agri-tech transformation will be discussed, especially the patterns of agri-tech in an academy of agricultural in China. This academy is named Guangdong Academy of Agricultural Sciences(GDAAS), which is located in guangzhou city in China. As well known that, almost every province has an academy of agricultural sciences like GDAAS in China. Hence a study of current situation of agri-tech transfer GDAAS is very useful to fully understand and known about Chinese agri-tech transfer present situation.

1. Presentation of GDAAS

GDAAS is an agricultural research organization directly regulated by the People’s Government of Guangdong Province. There are 15 research institutes and centers and over 2000

researcher in GDAAS. GDAAS plays the leading role in agricultural research and technology innovation and modern agriculture development in Guangdong. At present, coverage area of GDAAS new varieties and techniques takes up 40%-80% of the total planting area in Guangdong. Rice, peanut, sweet potato, wax gourd, chieh-qua, takes up more than 50% of the same crops planting area in Guangdong, More than 420 experimental and demonstration bases have been established over 100 counties in Guangdong, 15 science and technology contract have been signed with Guangzhou, Maoming and other 15 cities and counties, which constructs a science and technology achievement transformation network in Guangdong province in China.

2. Current situation of Agri-tech Transfer in GDAAS

Number of projects from 2015 to 2017

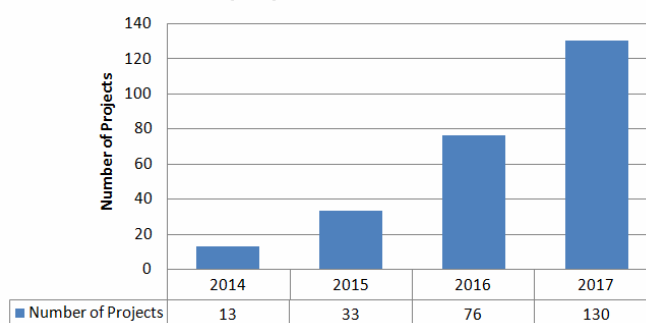


Figure 1. Changes in the number of projects from 2014 to 2017 in GDAAS

From 2014 to 2017, shown in Figure 1, the number of agri-tech transfer projects in GDAAS changes from 13 to 130, i.e., ten times in 2017 than that of in 2013. One of the possible reason might be that the economy in China has undergone earth-shaking changes during this period. Another reason is that the incentive policy on agri-tech transfer was published at

the begin of 2016. The incentive policy published largely improves every researcher's enthusiasm on technology transfer. This proves that the active incentive policy for the transformation of scientific and technological achievements is not only effective, but also immediate.

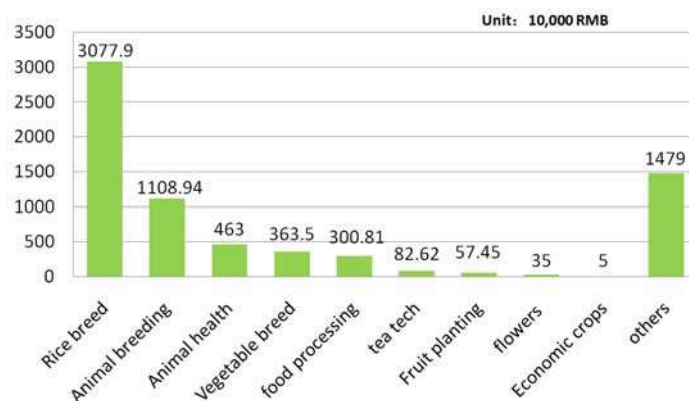


Figure 2. Agri-tech transfer patterns in GDAAS in 2016

As shown in Figure 2, the transformation of Agri-tech transfer patterns in GDAAS is mainly divided into 10 patterns in 2016. First of all, the transformation and permission for rice breed was 30.777 million RMB, accounting for 44% of the total transformation of agri-tech in the academy. It is because that rice

is one of the staple crops in south China. Almost every person in south China would eating rice every day. Secondly, the transfer of animal breeding technology, including feed, nutrition and other technology transfer license is 11.089 million RMB. Others are animal health technology, licensing and transfer of vegetable

varieties, technology transfer and technical services for food processing, licensing of tea varieties, fruit planting technology and licensing technology, and licensing technology for flowers. There are a total of 14.79 million RMB of other technology transfer services such as technology development, technical consulting, technical services, and technology licensing that do not include direct transfer of technology and licensing. Since

Guangdong province which is located in south China is at the forefront of reform and opening up, and the market economy is relatively developed. It can be boldly speculated that the diversification of the transformation of agricultural scientific and technological achievements in Guangdong can partly reflect the fact that the transformation of national agricultural science and technology achievements is becoming more and more diversity.



Figure 3. Number of agri-tech transfer projects in 2016 and 2017 in GDAAS

The number of projects in both 2016 and 2017 is dominated by tech transfer, with 79 percent in 2016 and 90 percent in 2017, as shown in Figure 3. In addition, investment by technology is only a small percent in both years. It might be because that using tech to invest and form a new company relates to series procedures and costs a lot of time.

In the view of figure 4, contract amount in 2016 is mainly made of breed transfer with 66 percent. However, tech transfer increases more over than breed transfer with 56 percent in 2017. From both figure 3 and figure 4, it can be concluded that breed transfer always plays an important role in agri-tech transfer.

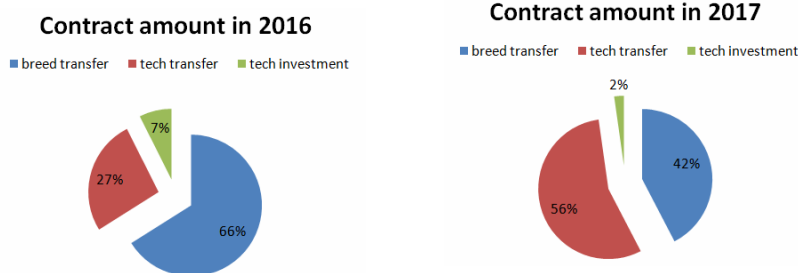


Figure 4. Contract amount of three categories of agri-tech transfer in 2016 and 2017 in GDAAS

3. Suggestions for continue improving Agri-tech transfer

3.1 build agri-tech transfer platform and aggregate resources

Building a platform for agri-tech transfer to form a highland and technological innovation and public service platforms contributes to establishing and improving the assessment database of argi-tech, and analyzing and summarizing the experience and lessons of scientific and technological achievements from multiple angles and levels. Firstly, by encouraging the development of technology intermediary services, it will build a smooth service platform for information exchange and achievement transformation. The supply side can accurately grasp the social demand for results, and also enable the demand side to seek innovative results with accurate information and greatly increase the effectiveness of scientific and technological achievements. Secondly, the mainstay of market guidance is the new agricultural management subjects such as agricultural leading enterprises, professional large

families, family farms, and farmer cooperatives, and the technological achievements of scientific research units will be transferred to the market. In order to form a virtuous cycle of innovation and transformation, commercial value is generated, capital is reinvested in scientific innovations in research units, and inventions and innovations form a sustainable cycle of innovation.

3.2 Create atmosphere and formulate incentive measures for transfer

In order to incentive researchers and workers, creating atmosphere such as broadcasting the benefits of agri-tech transfer is of great significant. Firstly, it is necessary to formulate a series of management systems such as selection of scientific research topics, project approval, organization and implementation, evaluation of scientific research achievements, and evaluation of job titles from the source, creating an atmosphere, and promoting scientific research on front-end basic research while encouraging the selection of scientific and

technological projects. Secondly, demand for market and production practices is skewed, and achievement conversion performance is used as one of the core evaluation criteria. Thirdly, there is a slant on the promotion of professional titles. It is necessary to formulate positive agri-tech achievements and encourage the formulation of the agri-tech achievements and boldly encourage scientific and technical personnel to carry out the transformation of scientific and technological achievements so that researchers can fully enjoy the benefits of transforming scientific and technological achievements.

3.3 Provide transform investment funds for agri-tech transfer

As scientific and technological achievements change from basic research theory to applicable achievements, they will generally experience the risk of “death valley”, where a large part of basic achievement will be ignored and die out. Applied research often requires a lot of human resources, financial resources to carry out agri-tech transfer. In order to promote scientific and technological achievements eventually become products into the market, some necessary risk investment funds should be equipped.

3.4 Increase efforts to cultivate agri-tech transfer talents with knowledge in multiple disciplines

The processing of agri-tech transfer relates to a huge amount of resources and knowledge in multiple disciplines. However, due to the insufficient attention paid to previous applied research, there is a large gap in the market for talented people who have the ability to conduct agri-tech transfer. Hence it is necessary to intensify efforts to cultivate workers with multiple knowledge and skills, including negotiation, agri-tech value assessment, finance, expertise, communication skills, and so on.

4. Conclusion

This study presents current main agri-tech transfer approaches in China, and current situation of agri-tech transfer approaches in GDAAS. It points out that along with the development of China economy, the agri-tech transfer also becomes prosperous and categories becoming diversity. Moreover, the incentive policy published plays an important role in improving agri-tech transfer. Furthermore, agri-tech transfer can be mainly divided into ten categories. The number of general tech transfer excluding breed is far more than that of breed transfer. The majority amount of contract in 2016 is breed transfer, while the majority becomes general tech in 2017.

In addition, in order to improve agri-tech transfer, this study gives some suggestions. First, building of agri-tech transfer platform and aggregating resources contributes to agri-tech transfer. Second, creating agri-tech transfer atmosphere and

formulate incentive measures for transfer activities is helpful in improving agri-tech transfer. Third, providing transform investment funds for agri-tech transfer activities is necessary. Fourth, increasing efforts to cultivate agri-tech transfer talents with knowledge in multiple knowledge and skill is very important.

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The National Library of Australia is the largest reference library of Australia, which was built under the terms of the National Library Act for "maintaining and developing a national collection of library material, including a comprehensive collection of library material relating to Australia and the Australian people." There are about 10 million items in the Library's collection including books, journals, newspapers, music scores, maps, e-resources, websites, manuscripts (personal papers and organizational archives), documentary pictures, oral history and folklore recordings. In 2013-2014, the library received 61,900 new items. As at June 2014, the proportion of the Library's collection described on the online catalogue is 92%. At the time 227 472 items had been digitized, including maps, music, books, journals, pictures, archives, oral history and folklore. Many of the items digitized contain multiple works, such as hundreds of photographs in a single album, or multiple pieces of music contained within a volume. The Library is also digitizing historic Australian newspapers and as at the time, over 13 million digitized pages, or 130 million articles, were freely available to the public through Trove. In June 2014, the total size of the Library's digital collections exceeds 3 petabytes.

The Library collects material produced by Australians, for Australians or about the Australian experience in all formats-not just printed works-books, serials, newspapers, maps, posters, music and printed ephemera-but also online publications and unpublished material such as manuscripts, pictures and oral histories. The Library has particular collection strengths in the performing arts, including dance. The Library houses the largest and most actively developing research resource on Asia in Australia, and the largest Asian language collections in the Southern hemisphere, with over half a million volumes in the collection, as well as extensive online and electronic resources. The library collects resources about all Asian countries in Western languages extensively, and resources in the majority of Asian languages including Chinese and Korean etc. Readers can access Aussie-Sino Studies from the Library.

The Library holds an extensive collection of pictures and manuscripts. The manuscript collection contains about 26 million separate items, covering in excess of 10,492 meters of shelf space. The Australian manuscript collections date from the period of maritime exploration and settlement in the 18th century until the present, with the greatest area of strength dating from the 1890s onwards. The collection includes a large number of outstanding single items, such as the 14th century Chertsey Cartulary, the journal of James Cook on the HM Bark Endeavour, inscribed on the Memory of the World Register in 2001, the diaries of Robert O'Hara Burke and William John Wills from the Burke and Wills expedition, and Charles Kingsford Smith's and Charles Ulm's log of the Southern Cross.

The Library provides a national leadership role in developing and managing collaborative online services with the Australian library community, making it easier for users to find and access information resources at the national level.

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