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# Using an Adaptive E-Learning Curriculum to Enhance Digital Literacy: Challenges and Opportunities

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**Abstract:** Universities have established the need for digital literacies as key graduate outcomes and must support students' development in these areas. In an era of widening participation, it is erroneous to assume all students will enter the sector with the technological skills required to support their studies. While some may be skilled technology users, many will lack the digital competencies required for academic success. Students need support for developing digital literacies, but explicit teaching may lead to frustration, as some are forced to "learn" skills they possess, while others are lost in the crowd. Adaptive learning technologies are particularly suited to addressing student diversity, as they automatically adjust to individual student's needs. This paper documents the development of a digital literacies curriculum that uses an adaptive e-Learning platform to prepare students for technology-rich academic environments. The curriculum was co-developed by academics and librarians and consists of lessons on information, data and media literacies, and online identity management. The paper outlines the pedagogical underpinnings of the lessons, alongside the challenges and opportunities observed during development process, and reflects on the impacts of adaptive technologies on teaching in blending learning environments.

**Keywords:** Digital literacy, adaptive e-Learning, information literacy, smart-sparrow, digital readiness

## 1. Introduction

Web 2.0 technologies have become so widespread in modern society that progression through university studies is now increasingly dependent on students developing a range of information and communications technology (ICT) skills alongside the specialist skills associated with their disciplines. Students are expected to have a core level of digital literacy to be successful in twenty-first century academic and work environments. However, with widening participation in universities and colleges, it is important to take note of the cautions expressed by the Educating the Net Generation report (Kennedy, et al., 2009), which warned against an assumption that 'digital natives' are entering the higher education sector with extensive existing digital literacies and the capacity to use those literacies to support their academic endeavours. Even students who are highly knowledgeable of ICTs "do not necessarily expect to use these technologies to support some activities, including learning" (Kennedy, et al., 2009, p.4). This paper describes the design of a digital literacies' curriculum, authored using proprietary adaptive e-Learning software, and outlines the pedagogical, contextual, and theoretical background behind the design. The aim of the paper is to discuss the rationale of the project and position it within the context of the relevant literature, before going on to outline an adaptive digital literacies curriculum that was undertaken as a collaborative endeavour between teachers, academic support, and library professionals. The project provided the collaborators with several challenges and

opportunities for curriculum and pedagogy development, and the lessons learnt will inform future use of adaptive e-Learning.

## 2. Digital Literacy and Higher Education

Widening participation in higher education calls for differentiated instruction that responds to the varying levels of technical experience, ability, and knowledge our students exhibit – and this is especially relevant to teaching digital literacies. Pedagogical research has ascertained that engagement is a key determinant of success, as well as a means of reducing inequities among diverse cohorts (Gabb, Milne & Cao, 2006; Kuh, Cruce, Shoup, Kinzie & Gonyea, 2008). Clearly, the provision of equitable digital literacy instruction calls for deliberate curriculum design that acknowledges engagement and differentiated instruction as key elements of academic success.

The US based organisation, EDUCAUSE, offers significant insight into the digital literacies of students in their universities and colleges. In 2015, their annual Study of Students and IT surveyed the digital literacy practices of over 50,000 students across 43 states and 11 counties (Dahlstrom, Brooks, Grajek & Reeves, 2015). Key findings of the 2015 student survey included: students' academic use of technology is widespread, but not deep; although omnipresent in students' lives, the leveraging of technology as an engagement tool is still evolving; and students have a complex relationship with technology – they recognise its value but still need guidance to use it in meaningful ways (Dahlstrom, et al., 2015).

Universities are increasingly offering multiple modes of education to prospective students. However, to enable students to fully take advantage of flexible learning and distance education, it is important to support the development of digital literacies and online learning skills (Yang, Catterall & Davis, 2013). Benchmarks set by the New Media Consortium and EDUCAUSE Horizon reports (Johnson, Becker & Hall, 2015) acknowledge the importance of training and institutional support for students regarding the effective use of learning technologies. The notion that students require a core level of digital literacy in order to succeed in university is becoming widely accepted, but a definition of what actually constitutes digital literacy – or, rather, digital literacies – continues to develop (Kiili, Mäkinen & Coiro, 2013).

The UK based Joint Information Systems Committee (Jisc, 2011) have adopted a definition of digital literacies as capabilities that support individuals to live, work and learn in a digital society. This definition recognises that digital literacies are multidimensional – incorporating multiple literacies and multiple aspects of literacy. Belshaw (2014), for example, put forward eight elements of digital literacies: cultural, civic, cognitive, constructive, critical, communicative, confident, and creative. Lankshear and Knobel (2003) had previously identified three dimensions of literacy: operational, cultural, and critical. Operational literacies included competency with tools and procedures, while the cultural dimension concerned an individual's ability to understand a text within its cultural context. The critical dimension of this model regarded an individual's awareness that literacies are socially constructed; they include some values while excluding others. It has also been remarked that digital literacies encompass a "plurality of understanding and skills" (Brown, 2014, p. 284), such as information, visual, technological and media literacies (Martin, 2006), hypermedia and photo-visual literacies (Aviran & Eshet-Alkalai, 2006) and games literacy (Schott & Selwyn, 2011). Different frameworks and models for supporting students have emerged as investigations into the nature of digital literacies have advanced (Buckingham, 2006; Eshet, 2012; Jisc, 2014; Jisc, 2015a; The Open University, 2015).

The DigEuLit project (Martin, 2006) described a three-stage model of digital literacies that include digital competence, digital usage, and digital transformation. These stages describe how students might use their competence, and then transform their use into creating and innovating using digital tools. Belshaw (2014), however, warns that the development of digital literacies is not a linear 'process', but rather subject to contextual variation. Within the UK's higher education context, Jisc have been instrumental in developing a conceptual framework (Jisc, 2015a) that describes the digital literacies necessary for student success. Jisc's six capabilities model of digital literacies (illustrated in figure one) identifies the range of digital literacies that university and college students need to master. These include ICT literacy; information literacy; data literacy; media literacy; digital learning and self-development; and identity and well-being. These models – particularly the Jisc six capabilities model – were used

to form a guiding framework for the development of a suite of adaptive e Learning lessons, which were designed to facilitate the embedding of digital literacies instruction into existing curricula at a university, as outlined below.

### 3. Adaptive e-Learning Platforms (AeLPs)

Adaptive e-Learning Platforms (AeLPs) use interactive activities with multiple pathways to redirect students to lesson material based on their demonstrated understanding of the content. This enables instructors to provide appropriate remediation as and where necessary, rather than making all the students' progress through lesson content at the same rate. The multiple pathways should also allow for students who have a good grasp of the content to move through the lessons at a more agreeable pace, lessening the potential for frustration at both ends of the spectrum. The interactivity of AeLPs enables a shift away from static (or linear) presentations of information by adapting instruction, learning activities and feedback to the individual needs of the learners. This, ideally, facilitates a holistic learning experience in which active learning, explicit instruction and evaluation combine to enable success among diverse learners (Mampadi, Chen, Ghinea & Chen, 2011; Murray & Pérez, 2015; Wauters, Desmet & Van den Noortgate, 2010). Research indicates that personalised content in online education can improve student performance (Gangadhara Prusty, Vrcelj, McCarthy, Ojeda & Gardener, 2013). With widening participation, institutions need to cater not only to students who are comfortable with using technology in a variety of contexts, but also to younger students who are not necessarily "digital natives", students from rural/remote areas who might not have had access to a wide range of technologies, or mature age students who may be uncertain about the technologies used for learning (Dawson et. Al., 2013). AeLPs enable us to cater to this diverse range of students.

The capacity of AeLPs to respond to the individual needs of students means that such technologies are well-suited to areas such as digital literacies, where students exhibit varying levels of pre-existing ability, and online or blended learning environments where personal engagement with learners is not always possible. This suitability derives from the platforms' provision of formative feedback in response to individual mistakes and personalised remediation during the learning process, rather than after summative assessment (Edathil, Chin, Zank, Ranmuthugala & Salter, 2014). Three levels of adaptivity were built into the platform used for our digital literacy curriculum:

1. Adaptive feedback, which allows instructors to provide help and address specific misconceptions,
2. Adaptive learning pathways, which provide varying sequences of content to facilitate fast movement through the package where information is known, or remediation where necessary, and
3. Adaptive content authoring, which enable instructors to use analytics to track lessons' outcomes, assess their efficacy, and adjust content and learning pathways accordingly (Smart Sparrow, 2014).

These elements introduce students to processes of independent learning in a structured, but personalised manner, therefore, “helping learners to become self-reliant, confident and able to make judgements about the quality of their own learning” (Nicol, as cited in Jisc, 2010, p.10). As a result, AeLPs are particularly well suited to the provision of instruction for diverse cohorts like the one used in this study.

#### 4. Institutional and Pedagogical Context

James Cook University (JCU) is a regional university located in Townsville and Cairns in North Queensland, with a third campus located in Singapore. It is a significant provider of higher education in the north east of Australia. A relatively small institution, JCU takes pride in responding actively to the contextual factors associated with its regional location. Regional universities need to be responsive to the access, engagement and outcome needs of their populations – this has been identified as critical to regional development and prosperity (Universities Australia, 2013).

The digital literacies curriculum project documented below was intended to use the capacity of current technologies to enable new types of learning experiences (Laurillard, Oliver, Wasson & Hoppe, 2009), while also effectively responding to the incoming digital literacies of students and developing their preparedness for academic and professional environments. The curriculum is currently being trialled in JCU’s Diploma of Higher Education (DHE). The DHE is an open access-course that has attracted a diverse array of students. Students are encouraged to see the course as a ‘stepping-stone’ to Bachelor qualifications. Within the 2016 cohort:

- 12% of students identify as Australian Aboriginal or Torres Strait Islander peoples;
- 63% are the first in their families to attend university;
- 32% are working with English as an additional language;
- 18% are from low socio-economic backgrounds;
- 10% are from regional or remote areas.

At the beginning of semester, students enrolled in the DHE were required to undertake a survey regarding their readiness for using technologies in a university context. Responses to this readiness assessment indicated that 38% of these students were highly anxious regarding online learning and that approximately 42% had no Internet access at home. Anecdotal evidence gleaned from conversations with students, tutors, academic support staff and lecturers suggests that there is also a wide range of engagement and capacity in the digital readiness of students entering other undergraduate degrees offered by JCU.

The DHE is designed to assist students with transitioning into university, and currently uses transition pedagogy to carefully scaffold, mediate and support the student experience (Kift, Nelson & Clark, 2010). Transition pedagogy entails a whole of student/whole of course approach, with curriculum serving as an organising device (Kift, 2009). This approach negotiates the gaps caused by diverse levels of preparedness and cultural capital among incoming students

(Kift, 2009). However, its success is dependent on the “intentional design of learning, teaching and assessment approaches that acknowledge the reality of the contemporary student context” (Sheppard & Hill, 2015, p.6). With regard to digital literacy instruction, this acknowledgement involves recognising the potential impacts of socio-economic, cultural, and demographic factors on students’ dispositions towards and experiences of information technologies.

Online engagement data from DHE cohorts suggests a preference for content that utilises user-centred design to respond to varying learning styles. Furthermore, student feedback from a core IT subject indicates that low engagement rates could be the result of students ignoring content that seems overly simplistic or, conversely, feeling overwhelmed by content that was overly challenging. While many supporting resources (such as videos and text-based guides) are available to students to assist them with building their digital literacies, these resources are linear in nature. Regarding interactivity, these resources may sometimes test a student’s knowledge about a concept, but do not have the capacity to remediate misconceptions. In 2016, the roll-out of the adaptive digital literacies curriculum extended the DHE’s model of personalised support by using an adaptive e-Learning platform (AeLP) to provide opportunities for skills development within an online environment that responds to students’ diverse levels of preparedness.

An initial roll-out of the adaptive curriculum within the DHE has been trialled over two semesters, so far. The first semester was used as a shakedown for the AeLP, and the lessons learnt from that roll-out of the e-Learning modules were used to refine the product for the second semester. At the time of writing, this semester is still in progress. It is anticipated that what is learnt from this project will provide a contextually specific evidence base for the further development of a whole of institution approach to digital literacy instruction for diverse learners – not only in this university, but in a regional Australian context.

The Australian context is largely missing from the literature regarding digital literacies and curriculum design at present. Projects undertaken in the United Kingdom with Jisc funding have produced a strong evidence-base for the use of online learning platforms for implementing whole of institution approaches to supporting digital literacies. Such approaches offer considerable support to international institutions – especially regarding their sustainability. The rationale for our project draws heavily from the work undertaken in other countries, acknowledging that the context of Australasian institutions may not be completely analogous to the United Kingdom and Europe.

Throughout the project, the Educating the Net Generation report and toolkit (Kennedy, et al., 2009) has contributed significantly to our understanding of the digital literacies of students and staff in the Australian context. Kennedy et al. (2009) administered an “experiences with technology” questionnaire to explore student and academic experiences with technology, followed by qualitative data collection. Key findings from the questionnaire indicate that:

- little empirical support exists for the popular conception that university students are digital natives and university staff are digital immigrants;
- student and staff experiences with technology (and their preferences for the use of technology in higher education) varies greatly; and
- the data paints a complex picture of the technological experiences first-year university students bring to higher education (Kennedy et al., 2009, p. 3).

These findings, in conjunction with the institutional context described above, indicate a need for differentiated and personalised digital literacies instruction. This need informed the selection of an AeLP for the digital literacies curriculum described below. The design of the lessons was also informed by principles of authentic and transformative learning.

Authentic learning occurs when task design and the context in which learning occurs reflect the way knowledge is used in the ‘real-world’ (Herrington, Reeves & Oliver, 2010). Didactic (or linear) online instruction can detach information from the context in which it is applied. Here, “knowledge itself is seen by learners as the final product of education rather than a tool to be used dynamically to solve problems” (Herrington & Oliver, 2000, p. 23). In contrast, authentic design integrates context and learning by allowing for practice in knowledge application. Herrington, Reeves and Oliver (2010) identify several characteristics of authentic e-Learning design, including real-world relevance, ill-defined tasks that require problem-solving, and opportunities for engagement from a range of theoretical and practical perspectives. When considering digital literacies, educational designers must attend to the manner in which authentic learning and transformative processes can be incorporated into procedural instruction. Such integration works best when learning includes reflection on the “procedural assumptions guiding the problem-solving process ... [to] reassess the efficacy of the strategies and tactics used” (Mezirow, 2003, p. 204). AeLPs can facilitate such reflection through the integration of ‘trap states’ that reflect common misconceptions. ‘Trap states’ are points in the interactive activities in which students are redirected back to remediated content if they reveal that they have not gained sufficient understanding. When students are faced with repeating information and exercises, they are given the opportunity to reflect on their previous understanding and choices. With these considerations in mind, a digital literacies curriculum was developed that could provide personalised instruction on the use of technologies for research, assignment preparation, and online identity management among diverse cohorts – particularly for students in non-computer science-based disciplines.

### 5. An Adaptive Digital Literacies Curriculum

The curriculum designed for this project builds on findings from the 2007-2012 Adaptive Mechanics project, which demonstrated that adaptive tutorials (ATs) had the capacity to improve student learning outcomes and comprehension of threshold concepts (Gangadhara

Prusty, et. al., 2013). The Adaptive Mechanics project found a positive correlation between the use of ATs, student outcomes and course satisfaction, and also showed reductions in failure rates and significant improvements among low performing students (Gangadhara Prusty, et. al., 2013). Our curriculum builds on these findings and responds to Jisc (2015b) recommendations that institutions provide a “progressive induction process with targeted support for students’ digital needs [in conjunction with] ... diagnostic tests on their digital practices” (Jisc, 2015b, p.2). As the AeLP generates usage analytics, it can also be used “to assess patterns of engagement and likely needs” (Jisc, 2015b, p.3) in an iterative process of development, roll-out, and refinement.

The curriculum designed for this project consists of three adaptive eLessons, two created in JCU by a team consisting of a lecturer and two librarians, with the third developed by a team based in La Trobe University, in Melbourne. These lessons were developed in keeping with the Jisc (2015a) six capabilities model of digital literacy (see Figure 1 below). The two lessons developed by JCU follow the narrative of a simulated group project. Creating a ‘story’ for the lessons was intended to provide more interest and coherency and give the students a reason for completing the exercises, much the way the narrative of games gives players a reason for progressing through the game’s challenges. Over the course of the first two lessons, the student user is given the task of directing virtual group members (henceforth referred to non-player characters, or NPCs) through a simulated group assignment. Within the narrative, the student and NPCs are supposedly creating a poster, and must go through several activities to prepare for this assignment. Throughout the lessons, two supporting NPCs – a librarian and a lecturer – guide the user through the lesson activities as well as providing feedback and remediation where necessary. Each of the student NPCs within the narrative embodies specific strengths and common misconceptions, offering an opportunity to reflect on different approaches to information and digital literacies. To complete the simulation, the student must negotiate with the NPCs to solve a series of challenges orientated around core digital literacies, such as information, data, and media literacies.



Figure 1: Six capabilities model of digital literacies (Jisc, 2015a).

These activities allowed the curriculum to offer opportunities to integrate transformative process into procedural instruction. For example, the information literacy lesson draws attention to the tendency of new students to only use Google, as opposed to specialist

databases and library collections, to conducting academic research. By allowing students to play out this misconception and experience its consequences in a simulated environment, the lesson directs attention to, and corrects, a habitual information seeking practice of novice researchers. In doing so, the lessons provide students with an opportunity to reflect on and adjust their research practices before engaging with actual assignments. By presenting students with scenarios, they will be subsequently confronted with throughout the duration of their studies, the transformative processes prompted by the e-Lessons should help them apply their knowledge in new academic contexts.

The learning environment, tasks, and interactions with fellow “students”, may have been simulated, but they nevertheless provided an opportunity to present the learning material in a way that was far more authentic than static and linear training material would have been. In the context of this adaptive digital literacies curriculum, authenticity is engaged by using a narrative that reflects the actual assessment processes that students are confronted with during studies at university. During these lessons students are presented with multiple potential solutions to tasks through interactions with the NPCs. Selecting from a range of solutions requires problem solving and engagement from a variety of perspectives, while adaptive pathways provide opportunities for reflection and diverse outcomes. The faux poster assignment also enables students to gain experience of group work and assignment completion in advance of encountering those situations, and there may be a flow on effect of helping the students think about strategies for dealing with group assignments in the future.

The use of a narrative and adaptive activities with the eLessons was intended to combine authentic learning theory and principles of game design in order to create an immersive (yet pedagogically sound) learning experience. The narrative is presented by the means of branching, context-dependent dialogue; the dialogue, interactions, and activities that the student encounters in the course of the lesson are dependent on the activities they have previously completed and the outcomes of those activities. Interactions with NPCs trigger a selection of responses and choices. The students’ choices then lead to branches of the lesson, which guide them through remediation pathways or advanced content, as required. Possible choices are delimited (and limited) by the lesson design, but the range of possible actions is broad enough to allow students to be held accountable for their choices in terms of future actions and feedback. This design consequently reflects Olli Leino’s (2012) articulation of Don Idhe’s idea that “the computer game [is] a technological artefact which makes players responsible ... for the freedom it endows them with” (p. 59). Fittingly, the learning experience “is not a feature designed into the game alone” (Jørgensen, 2008), but rather emerges from the process of interaction and negotiation between the student and the AeLP, just as it might in gameplay. The way the narrative provides context for the pathways enables the seamless integration of targeted scaffolding and formative feedback within authentic activities that

reflect the genuine day-to-day digital literacy requirements of tertiary study.

Each lesson in the suite focusses on a different element of digital literacy. The first lesson introduces the fundamentals of information literacy, which is defined in the Jisc (2015c) model as the ability to find, evaluate, manage, and reference academic content in conjunction with a critical awareness of credibility and provenance. The student is introduced to the NPCs and the faux poster assignment in this lesson and given the role of project manager. During the course of this lesson, the user guides NPCs through the process of searching for, evaluating, and referencing a range of sources including books, websites and journal articles. This process involves a series of simulations and activities that introduce the student to digital research practices, such as identifying search terms, selecting appropriate search tools and databases, using Boolean operators, and evaluating online resources. In the second lesson, the group members begin to construct their poster. This lesson explores visual, data, and media literacies through activities focussed on interpreting and presenting data, understanding copyright law, recognising file formats, critically evaluating visual media, and creating visual representations of academic content. The third lesson (developed by La Trobe University) sits outside of this narrative and provides an introduction to online identity management - including the processes of creating and maintaining digital profiles for career development. This last lesson addresses the aspect of digital literacy (Jisc, 2015c) defines as digital identity and well-being.

The activities in the lessons use common, simple input mechanisms such as multiple choice questions, drag and drop interfaces, text input tools, hotspot activities, and dropdown menus – primarily because the proprietary software used for this project tended to utilise these types of activities. It should be noted that the software chosen for the design of these lessons influenced the design both by virtue of its capabilities and because of the advice and support given by the educational designers working for that company. Had we used different software, the activities may have taken a different form. From a user perspective, the narrative should have made the activities seem less like a series of disjointed tasks, but rather meaningful activities within a context. On one level, the student was asked to simply select from a range of answers presented in a quiz format, but the narrative elevated the activity to one where the student responded to scenarios that reflected the realities of tertiary study in digital environments. Multiple choice activities are camouflaged within branching dialogue, and the adaptive platform means that users can experience the consequences of choices – for example, selecting to use Google rather than a university database for conducting research. This offers a process of learning by (simulated) doing, and draws on a multimedia design philosophy that engages:

- Simulated interactions, in which the learner is integrated into the narrative;
- Construct interactions, in which the learner produces content through on screen actions;

- Immediacy, so that the learner experiences the events triggered by their own actions/interactions;
- Feedback, in which the learner sees instantaneous responses from the platform;
- Goals, so that the learner is provided with a clear understanding of lesson objectives. (Tan, Ling & Ting, 2007)

This learning by doing model has been shown to boost engagement and motivation by facilitating practice in problem solving and self-evaluation (Tan, Ling & Ting, 2007). However, when regarding the context of role-playing lessons, designers also need to attend to the believability the narrative in order to promote immersion. In the context of our AeLP, narrative believability is closely related to principles of authentic design and processes of transformative learning. However, we are under no illusions that our delivery of that narrative enabled complete immersion by students. We were constrained by the technology available to us, as well as our own skills in the design and development of AeLPs and game-like environments.

### 6. Challenges, Opportunities and Reflections

This project, in its entirety, involved collaboration between academics, librarians and educational designers across two universities and an external company. This provided us with the opportunity to share knowledge and skills that enriched not only the final product, but also our working relationships. Each of the three lessons was designed by the group of professionals with the most teaching experience in that area. This resulted in a product that was significantly better than anything that would have been produced by any one group working alone. In working collaboratively, we also had the opportunity to learn from each other's expertise and gain different perspectives on the content of the lessons we were creating. The process of co-development enabled lecturers and librarians to pool our collective experiences with regards to the misconceptions and digital learning challenges that students face when working with learning and information technologies. The development of authentic trap states and remediation pathways also required conscious reflection on the implicit expectations that are placed on incoming students in technology-rich university environments. The array of experiences that people brought to the project also meant that team members were not only co-writers, but also a ready-made audience for testing activities and lesson content.

This method of collaboration was not, however, without its share of challenges. Possibly the greatest challenge we faced involved our collaboration with the educational designers working for the third-party software providers. Working at a distance, and with large periods of time between meetings, we found it difficult to fully convey what we wanted from the product and we frequently felt that we were not getting as much support, direction and understanding from the software providers as we would have liked. This was compounded by the fact that most of what we wanted to do with the software was not within our control; we had to ask the designers to create something for us, which, under different circumstances and using a different product, we might have been able to create for ourselves. On reflection, and in

terms of creative freedom and self-direction, it may have been better to have used a more open-source product and have been given training in how to create reusable learning objects using that platform. However, with regards the scalability of the project and expansion of the use of AeLPs within the university, an open-source product would potentially shift the onus of providing technical and design support back towards institutional IT staff.

Tensions between the technical/design constraints imposed by proprietary platforms and concerns regarding resourcing for technical support and training in relation open source solutions are well documented (van Rooij, 2007). In relation to AeLPs, the simplified user interface provided by proprietary software lowers entry barriers for academics, but only when instructors are provided with sufficient training in independent lesson development. The incorporation of technical support into vendor licences also enables universities to outsource some of the risks associated with the early adoption of new technologies. However, costs and the inflexibility of commercial software licences impose usage constraints and raises concerns regarding the sustainability of third-party licencing agreements. About open-source educational software, the presence of established communities of users and specialised in-house IT support have been shown to mitigate institutional concerns regarding the viability of open sources educational platforms (van Rooij, 2007). However, the development of custom designed open-source adaptive learning environments and the establishment of specialised user communities is still in its infancy. As such, and with regard to the use of open-source adaptive learning solutions at an institutional level, "[t]he threshold that enables perceived benefits to outweigh perceived risks" (van Rooij, 2007, p.442) has not yet been reached.

In terms of curriculum evaluation, the analytics built into the AeLP have enabled us to monitor student engagement, while initial anecdotal feedback from students and results monitoring has informed preliminary appraisals of the curriculum. The lessons were integrated into an existing subject, replacing a series of multiple-choice quizzes that had previously been used for assessment purposes. Completion of the adaptive curriculum constituted 15% of students' overall subject grade and the lessons were integrated into the subject's learning management system. The lesson completion rate (90 - 95%) was on par with – and, in some instances, marginally higher than – the completion rates for the previous quizzes (90%). Following the initial roll-out, the lessons appear to have contributed to improved results and submission rates on later student assignments. For example, the number of distinctions (grades of 75% or higher) awarded for the research component of a later presentation assignment increased by 13.7%, among students from the participating cohort located on the Townsville campus. Submission rates for the same assignment rose by 6.8% within the same cohort. However, these improvements in assignment results and engagement were not consistent across the four campuses on which the lessons were trialled, and it is not yet possible to establish a direct causal link between assessment results and lesson completion. Further analyses of cross-campus subject results and

lesson engagement data from the second semester roll-out (currently underway), in conjunction with follow-up surveys among participating students, will inform fuller assessments of the efficacy of AeLPs in relation to digital literacy instruction.

Overall, the project provided team members with the opportunity to explore and document the process of moving from pedagogical theory and a conceptual framework to a workable curriculum design. The adaptive nature of the platform and authentic design considerations required team members to map out possible misconceptions and the implicit technological requirements of tertiary study. The collaborative design processes provided team members with valuable insight into each other's working environments, enabling us to pool expertise from the fields of both library and information science and game design. In addition, the project illuminated tensions associated with the selection and development of sustainable e-Learning solutions that will support student engagement and instructional design needs, while concurrently meeting institutional costing and IT support requirements.

### 7. Conclusions

The move towards blended and online learning environments necessitates a base level of digital literacy among students. Yet, within the widening participation agenda, we must remain mindful of the different needs of diverse learners and the pressures these needs place on educators to provide differentiated instruction to students with varying levels of expertise. Adaptive learning technologies enable educators to respond to these challenges and provide personalised instruction to large cohorts of diverse learners, particularly in areas such as digital literacy where students may have vastly different pre-existing skillsets. In terms of teaching and learning, AeLPs enable a shift away from didactic or linear online instruction. However, in doing so, the development of adaptive lessons necessitates a design process that moves past the development of learning objectives and presentation of content, and towards a consideration of potential misconceptions and implicit assumptions, in conjunction with the development of variety of lesson pathways that enable fast movement through known content and remediation where necessary. The simulated environments that AeLPs provide also enable the development of authentic learning opportunities – but only when lesson design is informed by considerations of the contexts in which knowledge is to be applied. The digital literacies curriculum described above demonstrates how educational theories such as transition pedagogy, authentic design, and transformative learning can work in conjunction with aspects of game design (such as branching dialogue and multimedia design) to produce immersive personalised learning experiences.

An effective transition pedagogy requires instructional design that carefully scaffolds, mediates, and supports the student experience (Kift, Nelson & Clark, 2010). The digital literacies curriculum described in this paper exemplifies this pedagogy through the provision of an orientation tool that scaffolds and supports students'

entry into the online university environment. Initial evaluations of the lessons point towards heightened engagement and improved student results, but further research is necessary in order to determine the efficacy of the lessons in regard to enhancing students' digital literacies. Considerations of sustainability, technical training requirements for both IT and teaching staff and a desire for control and flexibility with regards to lesson design will inform future decisions about the use of either proprietary or open-source software. However, as communities of practice develop around open-source adaptive learning solutions it is expected that perceived barriers to entry at an institutional level may be reduced. The curriculum development process described in this paper demonstrates not only the suitability of adaptive learning technologies for digital literacies instruction, but also the way collaborative design can inform the development of authentic online learning experiences that respond to the needs of diverse learners.

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# Values Education in College English Classrooms: Integrating Theory and Practice

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**Abstract:** The representation of social values in English as a Foreign Language textbooks has never been a focal point in English education in China since it was restored as a compulsory subject in secondary and higher education. The ensuing rapid economic growth and excessive advocacy of accumulation of material wealth resulted in further negligence of moral education in higher education coursework, with lamentations over the absence of values education in college classrooms and declining values in youth heard from time to time. Given this, the Chinese government and educational authorities began to attach importance to moral and values education among college students. However, how can moral values be taught in college English classrooms? In an effort to answer this question and combining theory and practice, this paper investigates how values and moral education are incorporated into the college English curriculum and practices of integrating Chinese core/fundamental values into English language teaching.

**Keywords:** Values education, Chinese core/fundamental values, college English teaching (CET), college English curriculum

## 1. Introduction

Ever since English reentered China's National College Entrance Examination in 1977, English has become a compulsory subject in tertiary education. In the context of college English teaching (hereafter CET), the emphasis was hardly put on its moral dimension. This attitude has prevailed in foreign language teaching in China, and for most English teachers, the goal of a good English language education is to cultivate an elite scholarly group with a strong background in literature (Gao, 2013) and communicative competency rather than infusing moral values into teaching, which could be reflected from a series of national English curricula published during the last few decades. The first college English curriculum for all students was published in 1980, containing requirements that reading speed be emphasized with a goal of seventeen words per minute as well as a few on listening, speaking, and writing skills (MoE, 1980). Both College English Curriculum for science students issued in 1985 and the one for art students issued in 1986 by the then State Educational Commission, which is the present Ministry of Education (hereafter MoE), demonstrated that a common core of language was emphasized as vocabulary and grammar (Gao, 2013).

1999 saw the publication of a revised version of the College English Curriculum, which prescribed that college English teaching should 'foster the stronger reading ability of students and certain abilities of listening, speaking, writing and translation to help students communicate with English' (MoE, 1999). The College English Curriculum Requirements (For Trial Implementation) (CECR, 2004) for non-English majors at universities was issued five years later, which is the most recent Ministry document that makes modifications

to the English language policy for Chinese universities. According to an analysis of this version of CECR 2004 that translated and published by Tsinghua University Press in 2004, it is aimed 'to keep up with the new developments of higher education in China, deepening the teaching reform, improving teaching quality, incorporating technology to support the teaching process and meet the needs of the country and society for qualified personnel in the new era' (Gao, 2013). It could be clearly seen that the part and parcel of CET in China has consistently been the efficient psycholinguistic learning of the language rather than its moral significance.

However, English language teaching (hereafter ELT) is not merely a matter of training students in a particular set of skills. Rather, language teaching is a profoundly value-laden activity (Johnston, 2002). Students should be gradually guided to recognize social values, analyze them (including authors' implicit attitudes), and make independent moral judgments based on the represented event and behaviors (Feng, 2017). Therefore, it is increasingly realized that English language teaching is and always has been a profoundly and unavoidably moral undertaking.

## 2. Why Do We Teach Values in College English Classrooms?

Alexander (2005) argues that all communities within a society must share a common commitment to 'preserve, protect and defend the status of all human beings as intelligent, empowered and fallible moral agents.' Values at the macro societal level can be regarded as informing a country's codes and laws of governance, the way society operates and at the same time as informing, governing, and constraining human behavior (Maylor, 2016). It is widely recognized that schooling and education should play a central role in promoting

social cohesion and furthering the democratic ideas of the state, where schooling has always been projected as an ideologically neutral activity to promote moral participation and active citizenship. As Ryan, Bohlin, and Thayer (1996) put it, 'education in its fullest sense is inescapably a moral enterprise – a continuous and conscious effort to guide students to know and pursue what is good and what is worthwhile.' The Chinese equivalent of "education" means both teaching and cultivating needed knowledge and skills as well as inculcating values. The traditional Chinese culture has long attached great importance to education as a means of enacting values through shared behaviors and shared language, as it is firmly believed that values education helps create a learning environment that is conducive to strengthening students' academic achievement and enhancing students' social and relationship skills that last throughout their lives.

Johnston (2003) states that the English language can be used as a carrier of moral education as language learning is fundamentally and primarily moral in nature. Like any form of teaching, ELT crucially involves relations between people, and relations, as explained earlier, are fundamentally moral in character. The intimate relationship among who we are, how others see us, and how we treat and are treated by those others, is above all a question of human values. Therefore, students' exposure to moral education can be realized through the teacher's conscious or unconscious revelation of values reflected by their English textbooks via in-class discussion and participation. What is more, teachers play a vital role as moral agents, as students mostly consider the teacher as a role model. College English classrooms present the students with an opportunity to equip themselves with moral values, skills, and competencies that assist them in effecting personal and community positive changes (Asif, et al., 2020), especially in the context of rapid economic development in China leading to unwelcomed but not infrequent degeneration of moral values in the last few decades.

### 3. What Values Do We Teach?

After elucidating the importance of incorporating values education into College English (hereafter CE) teaching, it is necessary for us to consider what values we should teach in the CE classroom. As defined by Rokeach (1973), value is an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end state of existence. Therefore, values are largely culturally, socially, and politically constructed. As a country boasting five thousand years of history and civilization, China's moral values and cultural norms have been shaped by ancient philosophical beliefs which still impact and guide Chinese people's lives in all respects.

#### 3.1 Traditional Chinese values

According to Zhang (2013), the traditional cultural values that influence the psyche of the Chinese people are harmony, benevolence, righteousness, courtesy, wisdom, trustworthiness, loyalty, and filial piety, which mainly originated from Confucius' social philosophy. Harmony denotes balanced and proportionate coordination and

collaboration between things, which encompasses evenness, concord, and amity. The value of harmony advocates 'harmony but not uniformity.'

Benevolence, the core of Confucian thought, has been an important moral standard, personality state, and philosophical concept in ancient China. Based on familial ties, it extends to friendships and social relationships, producing a full set of values that include justice, courtesy, wisdom, honesty, loyalty, self-discipline, and commitment (Zhang, 2013).

In Chinese culture, the word "righteousness" combines two characters shaped like "man" and "sheep". It implies that a man's appearance and internal quality must be like a sheep's tender, kind, and goodwill because people mostly worship sheep so that they adopt "sheep" as one part of new characters which represent good things (Lei, 2011).

Courtesy covers a broad spectrum of courteous and respectful behavior. People who have courtesy would engage in a kind of cutting and carving and polishing and grinding of the self. Yet Confucians will say that any complete description of self-cultivation must include a role for the culturally established customs that spell out what it means to express respect for another person in various social contexts (Wong, 2020).

Wisdom indicates the ability to distinguish right from wrong, knowing oneself and other people, and being resourceful. In Confucius' words, 'Benevolence means to love, and wisdom means to understand others.' Besides knowing right and wrong, a man with wisdom performs the right actions upholding the truth, namely justice, fairness, and objectiveness (Tang, 2014).

Trustworthiness can be translated as the sense of trust or honesty and the ability to keep one's words. It also refers to a belief that another person can be relied upon in times of need. Trustworthiness is reflected through generosity, sincerity, kindness, and justice. Confucius considered "trustworthiness" a necessary character in developing and maintaining meaningful relationships with others in one's social life (Shek, et al., 2013).

Loyalty refers to a moral commitment to the sovereign of the state, family, friends, ideals, and self. But choosing to be loyal does not mean blind or habitual commitment, but intelligent, reasoned, and intentional.

Filial piety is a highly stressed family virtue in Confucianism. It can be interpreted as performing filial duties toward parents and ancestors and a benevolent and affective consideration and care for parents (Hwang, 1999).

#### 3.2 Government-promoted version of Chinese core values

In 2012, a set of new official interpretations of Chinese core socialist values, represented by 24 Chinese characters, were promoted. These core values include the national values of "prosperity", "democracy", "civility" and "harmony"; the social values of "freedom", "equality", "justice" and the "rule of law"; and the individual values of "patriotism", "dedication", "integrity" and "friendliness". From the Chinese government's perspective, it might

be argued that an emphasis on Chinese fundamental values is justified as they are considered central to the molding of Chinese identity and governing of a cohesive Chinese society. Therefore, schools of all levels were required to incorporate value education into teaching with the Ministry of Education issuing a document in 2014 to request all educational institutions to promote the so-called “Core Socialist Values.” These values are expected to rebuild faith amid concerns that the world's second-largest economy has lost its moral compass during its three-decade economic miracle (Xinhua News Agency, 2017). Robertson (2017) believes that this shows that China has begun to embrace much of their quite beautiful traditional culture once again and these core socialist values are somewhat reflective of our general vision for the future.

#### 4. How Do We Teach Values in CET Classrooms?

Many researchers have pointed out that the English as a foreign language learning (hereafter EFL) classroom is a natural place for moral education and develops a detailed framework for carrying out moral education in EFL classrooms. In the context of China's CE teaching, the representation of moral values, the role of the learner, the textbooks, and the teacher's practice of teaching all convey morally significant messages. It is beyond the scope of this paper to provide a detailed analysis of how moral meanings are conveyed in CE classrooms in general; rather, I have selected here one series of books used in my university for freshmen and sophomores as an example to demonstrate how values education can be blended into the CE teaching. This series of books is the Student Book 1-4 of *An Integrated English Course*, edited by He Zhaoxiong (2008) and published by Shanghai Foreign Language Education Press.

The framework employed for incorporating values education into CE classes, presented in Table 1, is adapted from the framework proposed by Shaaban (2005). It can serve as a rudimentary guide as to how values can be taught in CE classrooms. It is assumed that such practice will make the language learning process more effective and, at the same time, nurture positive values and life attitudes in students. The framework consists of the following parts: value, language skills, methods, and activities.

**Table 1** A proposed framework for incorporating values education into CE classes

Value	Language skills	Methods	Activities
Wisdom	Critical thinking	Learner autonomy	Letter writing
Honesty	Listening	Active learning	Debate
Friendliness /kindness	Writing skills	Project-based learning	Mini research
Courtesy/civility	Oral communication	Cooperative learning	Role-play
Equality	Reading comprehension	Task-based learning	Jigsaw-reading & discussion

Take Text 1 of Unit 5 from Student Book 2 of *An Integrated English Course* as an example. This text, “Letter to A B Student” is an excerpt from a sensitive and thoughtful letter written by a professor to his student who was disappointed at getting a B in his course. In this letter, the professor hopes his student can put his disappointment in perspective by considering what his grade represents and does not represent. The student is also expected to make a distinction between the student as a performer in the classroom and the student as a human being. The text's value conveys here is that we must gain the wisdom to put everything in perspective to clarify, appraise, or assess the true value, importance, or significance of them. We also can see ourselves from an objective viewpoint rather than being influenced by the label put on us by others. Reading this text is a great opportunity to develop students' critical thinking skills by having them actively and independently think of what their grades mean and do not mean in terms of their achievement or success as human beings or future accomplishments. By its very nature, the ESL classroom is a place where students try to improve their language skills and become autonomous learners. Therefore, the activity suggested here is that teachers can ask students to write a letter to their own parents if they fail an exam or don't look up to their parents' expectations by modelling the author. This activity not only enhances students' ability to think in a structured and rational way but practices their English writing skills as well.

Text 1 of Unit 5 from Student Book 3 of *An Integrated English Course*, “The Real Truth about Lies”, is an article that calls on readers to tell the truth whenever they are in doubt, written by Randy Fitzgerald. To arouse students' interests in learning and reinforce the message carried through the text, I usually start by playing a short clip from Episode 2, Season 10 of *Friends*, a well-loved American sitcom by Chinese English learners, in which Chandler accidentally blurt out the truth to a boy who didn't know that he was adopted. This hilarious clip never failed to amuse my students and sharpened their listening skills as well. At the end of this unit, I will then organize a debate over the topic “Should we tell an adopted child the truth?” My students always engage themselves in a heated debate over this topic and have ample opportunities to work on their listening and public speaking skills.

To instill the value of friendliness/kindness into students' minds, text 1 of Unit 4 from Student Book 1 of *An Integrated English Course*, “Dealing with AIDS” is a brilliant option. The theme of this article written by an American high school student whose best friend, unfortunately, died from AIDS is that dealing with AIDS strengthens the bond of friendship and encourages emotional and mature growth. As this article is also concerned with the public's discriminatory attitude toward AIDS-infected patients, I usually ask my students to do a mini-research about the public's perception of HIV patients in groups by designing a questionnaire in English by themselves. They then must post their questionnaire on their social media, gathering information and report their findings by writing a mini-paper. This

project-based learning method is a highly effective tool to motivate students to write in English and facilitate their problem-solving and cooperative skills. Moreover, it also reminds students to be friendly and understanding to socially marginalized communities like HIV-affected patients.

Text 1 of Unit 3 from Student Book 1 of *An Integrated English Course*, "Whatever Happened to Manners?" is an essay addressing the issue of good etiquette and manners, in which the author reveals that fewer and fewer people show good manners and the significance of gracious manners. To reinforce the moral message of being courteous and polite to others, I would organize my students into small groups and ask them to set up role-plays to demonstrate good and bad manners displayed in public spaces. Preparing for role plays renders students much-needed opportunities to make use of their innovative thinking and creativity and cooperate and communicate with their team members.

Equality is one of the values that has long been advocated both in the East and West yet is still want in our societies in almost every aspect. In Text 1 of Unit 12 from Student Book 1 of *An Integrated English Course*, "Gender Bias in Language", the author points out the language we use in daily conversation reflects in its own nature and from everything else about the language, prejudice, and discriminations against women. Teachers can find an article of the same theme as supplementary reading material for students to do jigsaw reading in groups. This task is a great way to encourage cooperative learning and problem-solving among students and promote gender equality between men and women at the same time.

### 5. Conclusion

It is hoped that the teaching practices for incorporating values education into the CE classroom proposed in this study will help CE teachers become moral agents of positive social change through creating a conducive, optimal learning environment for students so that they will grow into honest, socially responsible, compassionate citizens. Apart from imparting language knowledge and skills, CE teachers can also make students informed and reflective about important and cultural moral issues based on a framework which promotes civic values, basic social skills and attitudes, tolerance, and intercultural as well as intracultural communication (Shaaban, 2005). All in all, the CE teacher's role as a moral agent will become an imperative presentation of the main findings and discussion of the implications for future college English teaching.

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# A New Border Pedagogy to Foster Intercultural Competence to Meet the Future Global Challenges

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**Abstract:** The act of border crossing provides unprecedented opportunities for children, young people, and adults to develop intercultural competencies and skills that better enable them to live together mindfully. We present a new border pedagogy based on the concept of hybridity that works to build students' and citizens' intercultural competence by encouraging them to embrace potential miscommunication and intercultural conflict. By learning how to embrace hybridity, students can work productively to put what is known into crisis by constantly blurring and problematising boundaries, binaries, and identities. Our new border pedagogy promotes living 'together-in-difference' by encouraging students to critically interrogate issues of difference they face as they border cross. The border pedagogy for living together-in-difference encourages students to embrace intercultural conflict and potential miscommunication because of the questions and wonderings it kindles and inspires. Importantly, it presents a pedagogy that assists educators in building on the educational goals of the Melbourne Declaration and engaging effectively with the Australian Curriculum's cross-curriculum priorities so students can prosper individually, collectively, and communally in a globalised world.

**Key words:** Border pedagogy, border crossing, intercultural competence, hybridity, mindfulness

## 1. Introduction

We are troubled by the massive shift in mindset and practices needed to prevent colossal and complex human and environmental disasters seemingly inevitable by 2050. Unless severe thinking and behaviour change begins to happen now, violence against women, social unrest, the dangers of artificial intelligence growing beyond human control, widening income gaps, jobless economic growth, and massive long-term unemployment, to name a few, will continue to rise. But these globally debilitating realities can be addressed to ward off what appears to be our 'probable' future. Fundamentally, no one country or institution can address these challenges on its own.

The Millennium Project (Glenn, Florescu and The Millennium Project Team, 2015), an international participatory think tank that uses futures research to systematically explore, create, and test both possible and desirable futures to improve decisions in the present, puts forth 15 Global Challenges. The global challenges we face are sustainable development and climate change, water and sanitation, population and resources, democratisation, global foresight, and decision making, global convergence of information communication technologies, the gap between rich and poor, health issues, education and learning, peace and conflict, the status of women, transnational organised crime, energy, science and technology and global ethics. These challenges present an unparalleled invitation for Australian individuals, groups, and institutions to think differently about the future.

Because these challenges require intercultural competence at scale, we believe something intentional and disruptive must be done when it comes to teaching others how to live together, work together and solve global problems. Designing a pedagogy to prepare individuals, institutions, and governments to develop a robust intercultural competence is critical in this endeavour. This is particularly true if there is a hope for a better future than one characterised by the destruction of the environment, worsening intrastate violence, terrorism, corruption, organised crime, economic inequality, and the relentless and unconstrained violence against women, characterised by The Millennium Project (2015) as 'the largest war today' (p. 5).

## 2. It is Time to Grow Up

We argue seemingly insurmountable cultural barriers represent a massive obstacle to developing the intercultural competence needed to work in collaboration to address these 15 global challenges. What can perhaps ameliorate, and better foster intercultural competence is invitations to engage in 'border crossing' (Giroux, 1992). This is because the act of border crossing helps students to develop intercultural competencies and skills that better enable them to live together mindfully and in peace with each other and the environment. We think this is as akin to 'growing up'. This invitation speaks to the need to create pedagogical conditions in which students become border crossers to understand otherness in its own terms, and to further create borderlands in which diverse cultural resources allow for the fashioning of new identities. (Giroux, 1992, p. 28)

Students' and citizen's ability to recognise cultural borders requires instruction in contemplative practices that encourage them to develop deep knowledge and skills from the early years through old age. In other words, global citizens need pedagogical training where they learn mindfulness strategies to listen to and hear what others have to say. They also need to learn and practice how to respond positively to individuals who may have different cultural and linguistic backgrounds by drawing on informed frames of reference. These learned skills can then assist them in adapting, being flexible and empathetic and embracing an ethnorelative view so they are better prepared to communicate in different intercultural encounters appropriately and effectively. The Millennium Project characterises humanity as emerging from small-minded adolescence to planetary adulthood. We have been trying on roles of what it is to be Chinese or French, engineers or artists, for thousands of years, isolated into our own narrow beliefs of what we think to be true and right. Now it is time to grow up and become an adult planetary species. (p. 7)

In considering how humanity can "grow up" we propose that a new border pedagogy—based on the concept of hybridity—is needed. Hybridity as a concept is disruptive, but useful because it forces children, young people, and adults (students) to take 'seriously how ideologies are lived, experienced, and felt at the level of everyday life as the basis for student experience and knowledge' (Giroux, 1992, p. 176). When students learn how to embrace hybridity, they work productively to put what is known into crisis by constantly blurring and problematizing boundaries, binaries, and identities. To successfully navigate, collaborate and address the 15 Global Challenges requires a new border pedagogy that works to produce hybrid subjectivities and challenges all human beings to reject 'a notion of a fixed cultural past, recognising instead that any ideas of culture and tradition are inherently informed by current contexts' (Albright, Purohit and Walsh, 2006, p. 234). In other words, by recognizing the inescapable impurity of all cultures and the porousness of all cultural boundaries in an irrevocably globalized, interconnected and interdependent world, we may be able to conceive of our living together in terms of complicated entanglement, not in terms of insurmountable difference. (Ang, 2001, p. 194)

Thus, a new border pedagogy that assists individuals in embracing hybridity will better place them to view 'complicated entanglement' as a necessary condition for living together-in-difference (Ang, 2001) to meet the Millennium Project's 15 global challenges. With this understanding, students will be better positioned to value plurality and multiplicity within themselves and others, and throughout the world. Indeed, the concept of the 'whole world' itself is characterised by complexity, diversity, expansiveness, and heterogeneity. This type of border pedagogy then offers an opportunity for students and all citizens to view their subjectivities as not fixed, meaning they can come to understand they have the agency to critique, challenge, resist, create, and recreate their social worlds by thinking concretely, sympathetically, and contrapuntally about others, rather than only themselves (Said, 1993).

Our argument is simple, we believe a new border pedagogy based on the concept of hybridity is a compelling starting point to foster the intercultural competence needed to meet the 15 global challenges (Anzaldúa, 1987, 1990; and Giroux, 1992) because our encounters at the border—where self and other, the local and the global, Asia and the West meet—make us realize how riven with potential miscommunication and intercultural conflict those encounters can be. (Ang, 2001, p. 16)

Students who embrace the notion of hybridity and engage with a new border pedagogy, will possess new strategies to support divergent thinking when intercultural miscommunication and conflict arises, moving them away from relying on their more habitual convergent thinking (Anzaldúa, 1990) that is individual and often based on national identities. A new border pedagogy that embraces hybridity will prepare students to think about, even practice through scenario-based instruction, what to do when they first arrive at cultural borderlands a priori, so they can view and anticipate the experience of border crossing as providing extraordinary opportunities to critically interrogate issues of difference. Such a border pedagogy will highlight the need for them to transcend their set patterns and ways of thinking to develop a new perspective that includes—rather than excludes—confronting cultural experiences. If students are prepared and have practice thinking this way, it provides increased opportunities for them to develop a new consciousness that better enables them to transcend dualistic thinking (Anzaldúa, 1990). This is because they will have practice critically interrogating issues of difference through dialogue with self and others.

### 3. Living Together-in-Difference

The question, 'how are we willing to live together in the new century?' is a strong provocation for us as educators. A new border pedagogy also needs to address how Australians, particularly those with social, racial (e.g., White) and economic privilege have an easier time crossing physical borders but will likely struggle negotiating the invisible borders of culture and race (Gómez-Peña, 1996). We do not view the 'borderlands' as a 'utopian site of transgressive intermixture' (Ang, 2001, p. 164), nor do we view hybridity as a concept that makes it any easier to challenge individuals' ritualised and dominant ways of thinking about their own subjectivities. Rather, we view a new border pedagogy underpinned by hybridity as one that embraces a complicated entanglement replete with potential miscommunication and intercultural conflict where the ambivalence inherent in hybridity becomes the necessary condition for living together-in-difference (Ang, 2001). More simply, a new border pedagogy for living together-in-difference acknowledges that alternative identities exist and encourages students to reject those dichotomies of otherness that maintain the status quo and which globally, is not prepared to deal with the additional 2.3 billion people forecast to live on earth by 2050.

The systems for food, water, energy, education, health, economic and global governance are not built to cope with this growth and require a radical change in thinking if we are to avoid massive and

complex humanitarian and environmental disasters. Business as usual will not suffice. (Childs, 2015, P, 12).

We believe education, both institutional and non-institutional, viewed uncritically as ‘business as usual’, is simply a global reality needing to be disrupted. While there are pockets and examples of incredible innovation, most governments, particularly Australia, are more interested in seizing economic opportunities through educational preparation and reform. Take for example the Australia in the Asian Century White Paper (2012) which acknowledges the national education system, from early childhood to the tertiary sector, as a foundational component in the cultivation of individuals’ intercultural competence. The Paper views intercultural competence as primarily translating into individuals’ increased potential to access the economic benefits of the Asian Century. The paper details the following areas that universities should focus on to ensure Australian students have the necessary capabilities for the Asian Century:

- Boost the number of Australian students studying in Asia through closer links with regional institutions, and improve financial support and information for students who study in Asia
- Increase the number of students who undertake Asian studies and Asian languages as part of their university education
- Have a presence in Asia and establish an exchange arrangement involving transferable credits with at least one major Asian university.

Our question is, how will these foci help Australians collaborate with other global citizens to meet the Millennium Project’s 15 global challenges? In her forward to the Australia in the Asian Century White Paper, The Honourable Julia Gillard puts it this way “thriving in the Asian century therefore requires our nation to have a clear plan to seize the economic opportunities that will flow and manage strategic challenges that will arise”. (p. ii)

We are not introducing a new border pedagogy for living together-in-difference to foster an intercultural competence in citizens premised on seizing economic opportunities.

#### 4. Creative Solutions to Complex Challenges

Our new border pedagogy has been designed to foster intercultural competence as a set of dispositions and skills that are cultivated over time, which then becomes the critical knowledge and understanding needed to come up with creative solutions to complex challenges collectively with citizens across the world. Intercultural competence, although an elusive concept to pin down, has been determined to comprise specific attitudes, knowledge, skills, and behaviour that lead to effective and appropriate communication and actions in intercultural encounters (Deardorff, 2006). Intercultural competence is therefore fundamental to the development of relationships as it enables communication and interactions in which discovery, acceptance and transformation of self and others is possible. A new border pedagogy grounded by the concept of hybridity offers

a timely and valuable way to assist Australians, as well as global citizens, in becoming truly intercultural competent. Furthermore, a new border pedagogy conceptualised this way exemplifies rethinking the gamut of educational provision from the early years until old age, to promote individuals’ acquisition of the abilities needed to engage in critical intercultural citizenship (Byram, 2006). In this sense the new border pedagogy we are proposing, no longer permits students and citizens to ‘draw the line between us and them, between the different and the same, here and there, and indeed, between Asia and the West’ (Ang, 2001, p.3).

In what follows, we illustrate how our new border pedagogy for living together-in-difference—a work in progress—that can be leveraged to build students’ intercultural competence by opening new learning spaces (Teräs, 2007) that ‘address and analyse the fundamental uneasiness inherent in our global condition of togetherness-in-difference’ (Ang, 2001, p. 200). This is because a new border pedagogy that embraces disruptions of the ‘taken-for-granted’ is needed across all sectors of education. We believe the new border pedagogy presented is fundamental in fostering students’ wise humanising creativity where they are guided by ethical action, mindful of its consequences to solve problems individually, collaboratively, and communally (Craft, Chappell and Walsh, 2013). We believe the new border pedagogy for living together-in-difference can foster intercultural competence by disrupting notions of superiority and inferiority embedded in particular identities (Okolie, 2002) for the common global good.

#### 5. A New Border Pedagogy of Living Together-in-difference

Border crossing as an educational pursuit means that individuals are assisted to learn to think about themselves in a border context to facilitate crossings and connections between people, whilst being aware and critically reflective of issues of privilege and power (Romo & Chavez, 2006). Border crossing empowers an individual to aspire to come to know and understand otherness in its own terms, rather than being complacent that borders are needed to separate, define and control our lives and world. The borderlands are necessarily transgressive spaces where students can learn the skills and competencies that are required for sharing the present, and the future, with others mindfully and with an authentic desire for justice, sustainability, and peace in the world.

At its core, a new border pedagogy for living together-in-difference encourages students to engage in contemplative practices and then critically interrogate issues of difference when they border cross to foster their intercultural competence. This new border pedagogy requires students to embrace intercultural conflict and potential miscommunication by requiring them to constantly question their beliefs and behaviour. A goal is to encourage them to turn towards conflict and potential miscommunication, rather than away from it. As a pedagogy, the practice of sitting with discomfort and tension in a world rife with uncomfortable difference and indifference

towards all living things where we must live together-in-difference- is necessary.

Drawing on Deardorff's (2006) Process Model of Intercultural Competence, the new border pedagogy for living together-in-difference encourages learning as a process, demonstrating the continuing, and complex, nature of intercultural competence development over time. With this new border pedagogy, compassion and critical humility are core concepts acquired through mindfulness to embrace discomfort, knowing the goal is not to reject or abandon difference, but create a new hybrid subjectivity that is uniting. It is impossible to create a new hybrid subjectivity without interrogating the forces of globalisation and coloniality so as to develop the skills and dispositions to be deeply aware of cultural differences to the point where students can respect differences and stand together in solidarity with cultural others. Being able to stand in solidarity with others transcends the notion of tolerance (Nieto, 1994) allowing students to enter a third space where negotiation is possible so much that a hybrid consciousness is attainable (Karanja, 2010) leading to the internal outcome of ethnorelativism. When students realize a hybrid consciousness is possible they are better placed to embrace a critical intercultural citizenship where through their communication, behaviour and actions they model how different cultural realities are equally viable and possible in the present moment and into the future.

At the heart of the border pedagogy for living together-in-difference is the belief that intercultural learning is grounded in intersubjectivity and dialogue with self and others. Intersubjectivity, when applied to intercultural communication, is demonstrated when learners achieve the ability to take the subject position, while at the same time resisting turning 'the other' into an object (Tanaka, 2002). Intersubjective exchanges between people are therefore conducive to building relations of interdependence and collaboration, in turn fostering a greater sense of identity and belonging for the individual (Tanaka, 2002). Ideally, this manner of communication exemplifies the very heart of the concept of intercultural education, and it is certainly what is required as global citizens move forward to cooperate and co-exist together-in-difference. Intersubjectivity is crucially important as identities, representations of culture, stereotypes and othering all exist in relational encounters as the in-between space that is created through dialogue and negotiation with others (Dervin, 2011; Howarth, 2002). Thus, students should be assisted to develop communicative skills and knowledge that enable them to enter border and liminal spaces. We propose the following new border pedagogy as a means to support such learning and elaborate further on the model in the next section.

### 6. Compassion and Critical Humility

The new border pedagogy of living together-in-difference proposed in Figure 1 takes its starting point from the attitudes of respect, openness and curiosity that are required for intercultural competence as articulated in Deardorff's Process Model of Intercultural Competence (2006). In a broader sense though, compassion and

critical humility are the values that need to be cultivated within intercultural encounters, and the use of contemplative practices makes this more likely. Thus, this new border pedagogy views the affective components for intercultural competence as being more likely to arise when students develop and practice contemplative practices. Mindfulness specifically, as a state, and as a process, is a core contemplative practice that has been integrated into the new border pedagogy. 'Paying attention in a particular way, in the present moment, and non-judgmentally' (Kabat-Zinn, 2003, p. 13) facilitates awareness of intercultural realities, and arising individual, emotional reactions.

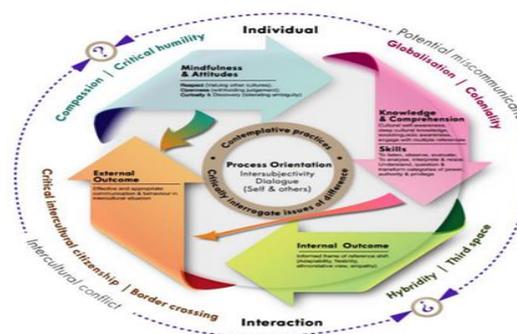


Figure 1. A border pedagogy of living together-in-difference

Mindfulness is not a new concept in regards to intercultural learning and it has been theorised previously in literature on intercultural communication and intercultural competence, although empirical research is more limited. Thomas (2006) includes mindfulness as a key factor in cultural metacognition, which is the linking mechanism between knowledge and behaviour in the model of Cultural Intelligence (CQ). Cultural metacognition enables an individual to pay deliberate attention to intercultural experiences, view situations with an open mind and control cognitive processes and responses, thus facilitating self-regulation during interaction (Thomas, 2006). Mindful intercultural communication therefore involves simultaneously attuning to self and other's assumptions, cognitions and emotions (Ting-Toomey, 1999). However, Ting-Toomey in an interview with Cañado (2008, p. 213) asserts that mindfulness in intercultural communication is primarily 'tuning in to yourself, to listen to the internal noises and clutter within yourself, and considering how to declutter the arising emotions, and that is a very layered and dialectical process'. In more recent research, Houde (2014) explores the relationship between mindfulness and the development of intercultural competence. He suggests that interculturally competent individuals pay attention to both internal and external experiences before they describe and label experiences and are therefore less reactive to inner experiences. In this way, intercultural competence can be developed through quieting one's ego by taking a non-evaluative stance towards internal thoughts and feelings as they

flow. Thus, when faced with frustrating or confusing intercultural encounters, mindful individuals may be more able to withstand emotional discomfort, understanding the temporary nature of such experiences.

Students who are assisted to develop mindfulness may be more prepared to meet each moment of life, whether perceived as good or bad, with receptive attitudes of acceptance, kindly curiosity and nonjudgement (Bishop et al., 2004; Shapiro et al., 2006). Through mindfulness, students can be encouraged to create space within themselves to allow feelings and thoughts to emerge without resistance, and this space acts as a buffer or gap for the normal, habitual reactions that may not allow for healthy, effective coping or behaviour. This gap fulfils a powerful purpose. For example, results from a recent study on mindfulness and automatic prejudice found that mindfulness meditation reduced implicit race and age bias among White college students in the United States (Lueke & Gibson, 2014). The research concluded that mindfulness practices could indeed assist in breaking down the unconscious boundaries that individuals use to enforce distance between themselves and others. With barriers dismantled, there is the potential for compassion to develop as one comes to acknowledge the interconnectedness inherent in sharing the human condition. Compassion literally means to 'suffer together' and although it is closely related to empathy, as it involves being able to take the perspective of another, it also includes a subsequent desire to act (Greater Good, n.d).

A second affective dimension included in the new border pedagogy for living together-in-difference is critical humility. Humility is essential for intercultural learning, as even if individuals are open towards and have respect for culturally different others, they cannot always expect, or assume, that they will actually be able to easily understand the symbols of other systems (Sample, 2013). Humility is an acknowledgement that we do not always have the answers, nor indeed at times, the questions themselves. In this respect, critical humility is the delicate yet difficult balance between the desire to act in the world, whilst at the same time having awareness that our knowledge is partial and evolving (European-American Collaborative Challenging Whiteness, 2005).

### **7. Globalisation and Coloniality**

Moving on from the affective elements in the process of intercultural learning, the proposed new border pedagogy for living together-in-difference views intercultural knowledge, comprehension and skills being under the influence of the larger societal issues of globalisation and coloniality. Development of the attitudes, knowledge and skills most often associated with intercultural competence may assist students to better enter and engage in intercultural situations, however intercultural communication, as a joint social activity, takes place in environments where imbalances of power and social injustice often exist (Shi-Xu, 2001). Educators should therefore support students to identify discourses of domination, exclusion and prejudice as a matter of priority. Part of this task relates

to assisting students to become aware of historical discursive practices and the power interests and power effects that impact upon communication and understanding between individuals and groups who are culturally different (Shi-Xu, 2001). The new border pedagogy calls for the focus of educating for intercultural knowledge to remain firmly on the necessity to provide students 'the opportunity to engage critically the strengths and limitations of the cultural and social codes that define their own histories and narrative' (Giroux, 1991, p. 360). Thus, knowledge acquired can enable students to engage multiple references and more importantly to understand, question and transform categories of power, authority and privilege. In this aspect, students should be assisted to resist contemporary modes of coloniality and the master narratives of globalisation. Globalisation must be problematised, rather than simply viewed as a 'neutral consequence of the application of neoliberal economic principles seeking efficiency in the allocation of resources and growth' (Falk & Kanach, 2000, p. 159). Likewise, while the outcomes of intercultural learning can be a foundation to build a common world in the age of globalisation, this world should be inclusive of many possible worlds, which means that learners must be equipped with tools other than Eurocentrism that they can apply when interacting with different others (Aman, 2013). This approach provides a framework where : alternative, or 'other', ways of thinking are reconstituted through thinking at epistemic borders, where differences are not just defined by modernity (eg: the modern nation-state system, inevitable progress), but also coloniality. This takes into account the lived experiences of vulnerable populations, as well as epistemological colonization over the past 500 years. (Rahatzad, Sasser, Phillion et al, 2013, p. 80)

### **8. Critical Intercultural Citizenship and Border Crossing**

The desired external outcome arising from this new border pedagogy for living together-in-difference is that border crossers develop commitment to education experiences holistically, and can later go on to connect their intercultural experiences in a broader sense to the opportunities they have as critical intercultural citizens. In this regard, it should be recognised that the goal of intercultural communication is not for students to gain 'understanding', but for intercultural speakers to jointly forge new meanings, realities and futures (Shi-Xu, 2001). The dialogue between intercultural speakers underpins the notion of critical intercultural citizenship (Byram, 2006), which further stipulates that communication needs to be coupled with action. Political activity, such as community involvement and service across cultural borders, therefore becomes a fundamental outcome of intercultural education. Critical evaluation of the taken-for-granted, both one's own beliefs and those of others, enables students to more easily see where prejudice and discrimination occur, and empowers students to act in ways to promote equality and cooperation. Therefore, education that intentionally includes critical intercultural citizenship as a guiding ethos can have a role in mobilizing students' 'critical consciousness to change the status quo for a better future, so that they

are ready to consciously try again and again to engage in the new discourses with the cultural Other' (Shi-Xu, 2001, p. 290). Australian students simply cannot afford not to engage meaningfully in intercultural encounters in which they participate, whether in Australia or abroad. This is because critical intercultural citizens are aware of the shared risk involved in not succeeding to live together-in-difference, which is already evident in the current state of the world, and hence, they are more ready to take seriously their responsibilities as they cross both physical and invisible borders (Reilly & Senders, 2009).

### 9. Caring About the Whole World

A new border pedagogy for living together-in-difference can not only foster intercultural competence but can be operationalised to assist all students across formal and informal settings to rethink how they can work together to live in peace and harmony with cultural others and planet Earth. Importantly it also presents a pedagogy that assists educators in building on the educational goals of the Melbourne Declaration and engaging effectively with the Australian Curriculum's cross-curriculum priorities so students can prosper individually, collectively and communally in a globalised world. We believe a preferable future for all citizens, in a global sense, does not relate solely to individual and corporate financial success and productivity. Rather, the many interconnected challenges facing the collective of humanity and all living things on planet Earth, are unquestionably more important than profit alone. We remain perplexed and alarmed by economic globalisation characterised by unprecedented climate change, the seemingly insatiable demand for finite natural resources, the growing scarcity of food and water supplies, religious and political fundamentalist perspectives and extreme examples of technology transforming human existence (Walsh, Chappell, Craft under review). Being able to work together effectively to address these issues demands all of us, as a global community, to not only contribute to both economic and knowledge related areas, but also to be open to learning from and communicating with others, regionally and globally.

Thus, the relevant skills that Australians, and one could argue all global citizens require in order to thrive in a future where high levels of cooperation are needed across cultural boundaries include adaptability; flexibility; resilience; design thinking; and a wise humanising creativity (Australia in the Asian Century Task Force, 2012; Craft, 2013; Walsh, Craft, Chappell and Kourlious, 2014; Craft, Chappell, Walsh, under review). Global citizens should ideally have the confidence and willingness to engage with diverse others as a means to understand different perspectives. Yet most education has generally not prepared students to think, act or live this way. Rather it has largely done the opposite. Indeed, modern education systems have often been described as more characterised by mindlessness than deep learning, competitiveness than compassion and prioritisation of the head over and rather than the heart (Langer, 1993; Miller & Nozawa, 2005; Rockefeller, 2006). But pedagogy is a powerful force to be

reckoned with. Those in power, the tiny elite who hold most of the world's wealth, resources and power would likely find a border pedagogy for living together-in-difference a viable threat to their powerbase and influence. We believe that the new border pedagogy for living together-in-difference proposed, could provide much scope for future research that challenges the status quo as it works to encourage peace through living together-in-difference (Ang, 2001). The new border pedagogy reminds us of the seemingly misplaced instructions for our planet; guidelines for not poisoning the air, water and soil have not been adhered to, and violence, corruption and destruction have taken root (Hawken, 2009; Thich, 2008). Yet, instead of pessimism for the future, we believe the new border pedagogy for living together-in-difference offers hope as it works with ordinary people and compels a willingness to 'confront despair, power and incalculable odds to restore some semblance of grace, justice, and beauty to this world' (Hawken, 2009, P, 12).

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# Research Synthesis on the Driving Factors of Enterprises to Exercise Environmental Responsibility and the Influences on the Value of Enterprises

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**Abstract:** The environmental responsibility of a company affects the sustainable development of the company. However, there is no consensus on the definition of corporate environmental responsibility and the impact of corporate's exercising corporate environmental responsibility on the value of the corporation. Through systematic and comprehensive research and review of domestic and foreign references, this paper summarizes the perspectives and various driving factors on corporate environmental responsibility. The paper also discusses the relationship between corporate environmental responsibility and corporate value. It summarizes the possible research methods and directions of corporate environmental responsibility and factors that affect corporate value, which may provide a model and reference for future research and development.

**Keywords:** Enterprise, environmental responsibility, driving factors, corporate value

## 1. Introduction

In the Work Report of the Two Sessions (the National People's Congress, and the Chinese Political Consultative Conference), Premier Li Keqiang made enforcing environment management and promoting green development as one of the key tasks to build a comprehensive, well-off society and a pollution-free environment. However, the reality is that China has serious environmental problems such as vegetation destruction, industrial and domestic waste, sandstorms and desertification, water pollution and air pollution. Environmental problems constitute a thorny issue for our country to fully realize a well-off society. Since reform and opening up, while China's economy has made great achievements, environmental problems have become increasingly prominent in the process of development. Corporates need to assume more and more environmental responsibilities, which directly affect the overall value of corporations and ultimately sustainable development. The problem of environmental pollution is becoming more and more severe, and society is requiring much more environmental responsibility from corporations. It is obvious that relying only on the power of the government cannot solve the increasingly serious environmental problems. An important source of environmental pollution comes from enterprises, so the important task of improving the environment lies with the enterprise. As an effective subject in the implementation of the circular economy, enterprises bear the dual responsibility of economic development and environmental protection, which reflects the most direct benefits of the circular economy, thus determining that enterprises are a substantial force for environmental protection. With

the expansion of the scale of enterprises and the gradual improvement of the market economy system, alleviating the increasingly prominent contradictions of corporate environmental responsibility that have been exposed in the process of corporate operations is of extreme importance, to the dual significance for the development of green economy and the realization of corporate value for Chinese companies. This article attempts to analyze the characteristics of the definitions of corporate environmental responsibility, driving factors and the impact of environmental responsibility on corporate value through a systematic literature review.

## 2. Definition and Characteristics of Corporate Environmental Responsibility

Scholars from home and abroad have not reached a universally recognized definition of corporate environmental responsibility. The European Commission defines corporate environmental responsibility as a voluntary act of an enterprise that takes voluntary acts and measures to make the environment cleaner. However, the World Business Council for Sustainable Development defines corporate environmental responsibility as the legal behavior of an enterprise that should abide by relevant laws and regulations on environmental protection. However, academia generally believes that corporate environmental responsibility is part of corporate social responsibility. Therefore, academia defines corporate environmental responsibility as corporate social behavior. Ma Yan (2003)<sup>[1]</sup> believes that corporate environmental responsibility means that while seeking to maximize the interests of shareholders, companies should also consider the social, moral, and legal responsibilities of environmental protection,

consciously protect the environment, and seek sustainable development of the economy and society. He, Zhu & Chen (2014)<sup>[2]</sup> defined corporate environmental responsibility from an economic perspective and defined this as the regulation and guidance of a certain economic mechanism, which means that the enterprise actively or passively allocates and uses environmental resources according to social welfare maximization standards. From the aspect of the law, corporate social responsibility is the lowest level of responsibility that an enterprise must conform with; from the aspect of corporate strategy, environmental responsibility is a responsibility undertaken by an enterprise for its long-term interests, and is oriented towards economic interests; at a social and moral level, environmental responsibility is a company's response to the appeals and expectations of the entire society for environmental protection; it is the highest level of responsibility for the sustainable development of mankind and thus is a voluntary behavior of the corporation.

The reason why the definition of corporate environmental responsibility cannot be agreed upon is that scholars have different perspectives when defining it. In fact, because corporate environmental responsibility itself involves many fields such as economics, management, law and sociology, it is a broad interdisciplinary concept.

### **3. Research Perspectives of Corporate Environmental Responsibility**

Scholars have analyzed corporate environmental responsibility mainly through theories and viewpoints such as signal transmission theory, sustainable development theory, stakeholders, corporate citizenship behavior, and corporate social responsibility.

#### **3.1 Signal transmission theory**

Ross (1977)<sup>[3]</sup> put forward the theory of signal transmission, which posits that there is an obvious information asymmetry between two parties in the transaction process. When a company delivers positive information to the market, the market will respond positively and increase the price of company's stock price; on the contrary, if a company does not disclose relevant information or transmits negative information, the market will react negatively and the price of company's stock will fall. Signal transmission theory can also be used to analyze the relationship between corporate environmental responsibility and corporate value. With the current emphasis on environmental issues by the community, the viewpoints of environmental protection and sustainable development are deeply rooted in the hearts of the people. Many believe that the fulfillment of environmental responsibilities by enterprises is not only the legal responsibility of the enterprise but also the moral responsibility of the enterprise. Corporations in various countries have begun to make the performance of environmental responsibilities the highest priority of their corporate strategy. They have come to regard it as an important part of their business operations and organizational management. Companies must show that they are sincere about their environmental responsibility and related information to the public and compare

themselves with those companies that do not perform well in their responsibilities, so as to convey to the market that they have good prospects for company development, ample funds, and are responsible to society for the environment. It establishes a good corporate image and improves a corporation's reputation. This signal is important to improving the confidence of investors, winning the support and understanding of the public to gain economic value and social value. That is, the improvement in the total value of the enterprise.

#### **3.2 Sustainable development theory**

The theory of sustainable development means that development not only satisfies the needs of contemporary society but also does not sacrifice the interests of future generations. Sustainable development has two meanings: on the one hand, it needs to meet the appropriate development needs of contemporary society; on the other hand, the development of contemporary society should also take into account the development of future generations, not induce excessive damage to the environment and waste resources. Therefore, the theory of sustainable development requires that human development should pay attention to the sustainability of development. The main element ensuring sustainable development is the enterprise. The enterprise must change from the traditional production methods to the environmentally sensitive production methods. Therefore, it requires the enterprise to assume more environmental responsibilities, so that the concept of sustainable development should be incorporated into one of the primary goals of the enterprise.

#### **3.3 Stakeholder theory**

Freeman (1990) clearly proposed the stakeholder theory in 1984. The stakeholder theory posits that the stakeholders of a company should include shareholders, creditors, employees, consumers, suppliers and other trading partners, as well as government departments, local residents, local communities, media, environmentalist and other pressure groups, and even the natural environment, descendants, and other objects directly or indirectly affected by the business activities of the enterprise. These stakeholders are closely related to the survival and development of the company. Some of them share the business risks of the company, some have paid for the business activities of the company, and some supervise and restrict the company. When making the decisions of the business, their interests must be considered or their constraints must be accepted. This theory provides a strong practical basis for enterprises to fulfill their environmental responsibilities. The natural environment and future generations are all stakeholders of enterprises. Therefore, enterprises should protect the environment, save resources, and assume environmental responsibilities.

#### **3.4 Corporate citizenship behavior theory**

Corporate citizenship behavior requires companies to combine basic social values with the company's daily business practices. Enterprises are the cells of society, and society is the source of corporate interests. Therefore, while enjoying the opportunities and benefits that society brings to enterprises, enterprises must also give back to society. Therefore, as a citizen of society, enterprises should

assume their responsibilities to society, provide employees with a good working environment, create more value for society, pay attention to social welfare, and protect the environment. Therefore, according to corporate citizenship behavior theory, as a social cell, the enterprise has enjoyed the benefits brought by society, and so, it is a matter of course that the enterprise has an inescapable responsibility to assume environmental protection.

### 3.5 Corporate social responsibility theory

Corporate social responsibility (CRS) means that companies should not only assume legal and economic responsibilities, but also have the obligation to assume responsibilities that are conducive to the realization of social goals and values. Dahlsrud (2008)<sup>[5]</sup> analyzed 37 frequently used CSR definitions and found that although CSR definitions are extremely diverse, the overall view is a combination of five dimensions: society, economy, stakeholders, environment and initiative. Later, Moon and Shen (2010)<sup>[4]</sup> analyzed 73 CSR definitions of Chinese corporate social responsibility in the research literature and found four main dimensions: society, environment, stakeholders, and ethics. Therefore, with the increasing prominence of environmental issues, environmental responsibility is one of the important dimensions of corporate social responsibility.

## 4. Driving Factors of Corporate Environmental Responsibility

At present, the environment is a public good that every enterprise or organization can use without having to pay for it. Under these circumstances, the fulfillment of environmental responsibility by a company means that a part of their resources, funds and time should be invested in activities that do not directly bring economic benefits to the company. To most companies, profit is the primary purpose of business operations, but this environmental activity does not provide enterprises with short-term benefits. On the contrary, it will lead to an increase in short-term costs of the enterprise, and at the same time, it is also detrimental to the performance of enterprise managers during their tenure. However, it is beneficial to the long-term profits of the enterprise. Companies that can sacrifice short-term benefits and invest a lot of resources to fulfill their environmental responsibilities are mainly driven by the following two factors.

### 4.1 Internal driving factors

Although companies fulfilling environmental responsibilities in the short-term means increased costs, in the long run, this investment can reduce costs or increase profits. From the perspective of sustainable development, the cost of a company's environmental responsibility can be seen as an investment in future benefits. There are two considerations: First of all, as environmental resources and energy become increasingly scarce, the traditional production and operation model of enterprises does not conform to sustainable development strategies. As time goes by, it will bring about more and more obvious economic disparities. Enterprises that change their production and operation methods as soon as possible and fulfill their environmental responsibilities will bring higher competitiveness in

the future. Therefore, the fulfillment of environmental responsibilities by enterprises can produce a lasting impetus to their future production and development. Secondly, the behavior of enterprises to perform their environmental responsibilities will be more and more recognized by society, and the behaviors of performing environmental responsibilities will inject more added value into their products. These added values constitute the intangible assets and competitiveness of the enterprise in the market. The formation of intangible competitiveness is conducive to the economic interests of the enterprise itself and could provide strategic benefits for the enterprise.

### 4.2 External driving factors

As society pays more attention to environmental issues, citizens and governments will increasingly expect companies to fulfill their environmental responsibilities. External pressures include strong laws, regulations, policies, and other hard constraints. At the same time there are pressures from consumers, investors, and public opinion. These pressures are manifest in two ways: On the one hand, there is the substantive restraint and supervision of enterprises. If the company does not fulfill its environmental responsibility, the enterprises will be dealt with by direct control from government, economic penalties, consumer boycotts, news media exposure, etc., through the law, the government, and the market public forces to force the company to change its business model and fulfill its environmental responsibilities. On the other hand, it can manifest as an incentive. If the company actively fulfills its environmental responsibilities, external forces will transform this into economic profits for the company, through government awards, consumer popularity, social recognition, media publicity, and so on. From the positive and negative aspects, the external pressures faced by enterprises in fulfilling their environmental responsibilities is transformed into the driving force for enterprises to fulfill their environmental responsibilities; so that enterprises that value environmental responsibilities can benefit, while those ignoring the performance of corporate environmental responsibilities will result in short-term loss to the company.

From an internal point of view, enterprises can transform their production and business models by fulfilling their environmental responsibilities, and they can gain a long-term competitive advantage through the rational use of resources. At the same time, the performance of environmental responsibilities can be regarded as an investment in the future, which can enhance the reputation and social image of the company, making the enterprises more competitive. From an external point of view, companies are subject to multiple pressures from the government, consumers, investors, and the general public in fulfilling their environmental responsibilities. These pressures objectively bring appropriate incentives and constraints to enterprises and become the source of motivation for enterprises to fulfill their environmental responsibilities.

## 5. Research on the Correlation Between Corporate Environmental Responsibility and Corporate Value

Since Freeman (1990) began to study the relationship between

corporate social responsibility and corporate performance, many scholars at home and abroad have been conducting in-depth discussions on the correlation between social responsibility (including environmental responsibility) and corporate performance and value, but scholars have not arrived at a consistent research conclusion. Through extensive searches and analyzing a large number of documents, the correlation between corporate environmental responsibility and corporate value is mainly described in four ways: positive correlation, negative correlation, irrelevant relationship and U-shaped or inverted U-shaped relationship.

### **5.1 Corporate environmental responsibility and corporate value are positive**

Freeman (1990)<sup>[6]</sup> discovered that the performance of environmental responsibilities by companies is positively correlated with their long-term profitability and financial performance. Robert and Mahoney (2002)<sup>[7]</sup> took Canadian stock market listed companies as the research subjects and found that the environmental responsibility of Canadian listed companies is positively related to company value. Russo and Fouts' (1997)<sup>[8]</sup> research found that the optimization of corporate environmental policies can help improve corporate reputation and prestige, bringing competitive advantages to companies, and thereby increasing corporate value. Konar and Cohen (2001)<sup>[9]</sup> also confirmed the positive correlation between corporate social responsibility and corporate financial performance. Goll and Rasheed (2004)<sup>[10]</sup> studied the positive correlation between corporate social responsibility and corporate performance, and the intermediary role of corporate environmental responsibility. Domestic scholars Zhang, Liu, Zhang (2009)<sup>[11]</sup> used stakeholder theory to analyze the performance of corporate social responsibility (including environmental responsibility) and concluded that it is not simply altruism, but an optimal choice for self-interest and altruism. Tang et al. (2010)<sup>[12]</sup> took listed companies in Hunan Province as examples and found that the company's performance of environmental responsibilities was significantly positively correlated with its profitability. Tian (2010)<sup>[13]</sup> researched the introduction of new technologies by enterprises and found that it reduced resource consumption, lowered environmental governance costs, and fulfilled their environmental responsibilities, thereby improving their economic performance and corporate value. Shi (2014)<sup>[14]</sup> theoretically considered the driving factors of corporate environmental responsibility, and empirically verified that there is a positive correlation between corporate environmental behavior and corporate value. Liu and Song (2012)<sup>[15]</sup> divided corporate social responsibility into four dimensions: customers, employees, environment and charity. Through empirical research, it was found that the fulfillment of corporate responsibilities to customers and the environment was positively related to corporate value and performance. Fang (2014)<sup>[16]</sup> found that no matter in the long-term or short-term, the better the performance of corporate social responsibilities (including environmental responsibilities), the more conducive to the improvement of corporate value.

### **5.2 Corporate environmental responsibility is negatively related to corporate value**

Ingram and Frazier (1983)<sup>[17]</sup> analyzed the content of the annual reports of 79 manufacturing industries and found that the performance of corporate environmental responsibilities is negatively correlated with corporate profitability. The research results of Crisostomo (2011)<sup>[18]</sup> indicated that the environmental responsibility of enterprises will reduce the economic value of enterprises to a certain extent. Qin (2006)<sup>[19]</sup> took as samples listed companies in China's power industry and found that the environmental responsibility of enterprises is negatively related to the short-term economic benefits of enterprises. Shao (2009)<sup>[20]</sup> conducted an empirical study on our country's chemical products industry and found that corporate social responsibility (including environmental responsibility) activities have a negative impact on corporate value. Wan and Liu (2013)<sup>[21]</sup> found that the excessive environmental protection expenditure of enterprises is negatively correlated with the current enterprise value. Wang and Xu (2010)<sup>[22]</sup> used a sample of companies in the Beijing area as research subjects and found that the performance of environmental responsibilities by companies that year had a negative impact on the subsequent financial performance of the company.

### **5.3 Corporate environmental responsibility is not related to corporate value**

Arlow and Ackelsberg (1991)<sup>[23]</sup> took a sample of private companies as research subjects and found that the performance of corporate environmental responsibilities was not related to corporate profitability. A. McWilliams and D. Siegel (2000)<sup>[24]</sup> used KLD to evaluate corporate social responsibility performance and found that there is no relationship between social responsibility and corporate financial performance. Domestic scholar Fan Qi (2013)<sup>[25]</sup> studied the relationship between environmental responsibility of state-owned enterprises and company value using a sample of state-owned listed companies and found that the correlation between environmental responsibility and company value is not significant. Liu and Kong (2006)<sup>[26]</sup> found the non-significant correlation between the corporate profitability of a sample of Shanghai A-share listed companies and their corporate social responsibility contribution rate (including environmental responsibility).

### **5.4 The relationship between corporate environmental responsibility and corporate value is U-shaped or inverted U-shaped**

Archie and Carroll (1979)<sup>[27]</sup> proposed that the fulfillment of corporate social responsibility has a U-shaped relationship to corporate value. Haire and Bowman (1975)<sup>[28]</sup> took polluting paper-making companies as research samples and found that the profitability of medium-sized environmental management companies is better than that of companies with good or poor environmental management, and therefore the performance of corporate environmental responsibility and corporate profitability is in an inverted U-shaped relationship. Bricker R. and Chandar N (2000)<sup>[29]</sup> took Finnish companies as the research subjects and came to the same conclusion. Domestic scholars

have found that corporate social responsibility and corporate value present a U-shaped relationship (Zhu, 2010; Jiang, 2010; Li, 2012)<sup>[30][31][32]</sup>, and there are no domestic research papers that show the relationship is an inverted U-shaped.

In summary, regarding the relationship between corporate environmental responsibility and corporate value, the conclusions of domestic and foreign scholars include positive correlation, negative correlation, non-significant correlation, and U-shaped or inverted U-shaped relationships. The positive correlation research conclusions show that: the company's active commitment to environmental responsibility not only enhances the company's reputation and image, but also contributes to the improvement of the company's production efficiency, thereby helping to enhance the company's value. The negative correlation research concluded that: because companies have invested a lot of resources and expenses to assume environmental responsibilities, they are at a disadvantage compared to those companies that do not assume environmental responsibilities, so the high costs of investment will not create favorable results in the short term, which brings high risk and uncertainty, and will affect the short-term performance of the enterprise, making the environmental responsibility of the enterprise negatively related to the value of the enterprise. Non-significant research conclusions: although the company has invested a certain amount in fulfilling its environmental responsibility, the company has increased resource utilization and reduced other costs such as production due to the investment of funds. Therefore, economic benefits will not be affected. The research conclusion of the U-shaped or inverted U-shaped relationships posits that those companies with a moderate level of environmental responsibility performance have the best corporate value performance, and the corporate value performance of the best environmental responsibility performance is not good. The divergence of empirical research conclusions is due to the different circumstances of the different companies in different industries and inconsistent research samples used by scholars, and there is no agreed measurement of environmental responsibility at present, and there is no accepted and mature measurement method.

## 6. Conclusion

The following recommendations flow from the research literature: Firstly, we need to comprehensively define social environmental responsibilities in various fields. Since scholars currently define corporate environmental responsibility based on one or several theories from different fields and industries, the definition of corporate environment responsibilities should be integrated into various areas in the future, to have a clear definition of corporate environmental responsibility, which provides a solid foundation for the in-depth study of corporate environmental responsibility, so as to deepen other related research on corporate environmental responsibility.

Secondly, we need to develop appropriate measurement tools for corporate environmental responsibility. At present, scholars have not

reached consistent research conclusions in the research on the corporate environment. The most important reason is that the current measurement of corporate environmental responsibility at home and abroad is not codified, and there is no agreed standard. Therefore, the development of appropriate and mature measurement tools will help scholars to carry out empirical research on corporate environmental responsibility.

Thirdly, we need an in-depth analysis of the impact of corporate environmental responsibility performance on corporate value and corporate economic performance. Big data has become a hot topic of current research. Therefore, in order to study the relationship between the two in a more in-depth and accurate manner, it is necessary to use big data to expand the sample size and make the research more scientific and accurate.

Fourthly, we need to analyze the joint effects of external systems, social environment and internal organizational elements on the performance of corporate environmental responsibilities. From the perspective of institutional theory and market theory, scholars have analyzed the impact of the external institutional environment of a company on the performance of corporate environmental responsibilities, but external and internal factors have an impact on each other. Therefore, under the same institutional environment, internal factors are more conducive to the fulfillment of environmental responsibility, that is, the influence of the relationship between the environment of organizational factors and the fulfillment of corporate environmental responsibility requires further empirical research and analysis.

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# Cultivating Media Literacy in College English Teaching by Highlighting China's Core Values in the Digital Age

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**Abstract:** With the increasing reliance on digital technologies and online media for teaching and learning, College English Teaching (hereafter referred to as CET) is facing unprecedented challenges in Chinese universities. The study reported in this paper investigated the issues of college students' dependence on online media and its consequences, which demonstrated that it is necessary to integrate media literacy education into CET to enhance students' language learning ability through digital communications. The paper argues that China's core values should be emphasized when cultivating college students' media literacy in CET in the digital media era.

**Keywords:** Media literacy, college English teaching, integration, China's core values

## 1. Introduction

Our time has seen an explosion of mass communications among which Internet and mobile mass communication is developing most rapidly. The influence of Internet media such as email, social media sites, websites, and Internet-based radio and television has permeated all facets of our lives. The advent of the digital age and the era of Internet media bring about tremendous challenges and opportunities to educational settings as well. "Knowledge, in the sense of information, means the working capital, the indispensable resources, of further inquiry; of finding out, or learning, more things" (Dewey, 1916). Dewey's words have never been so true in today's world of learning. It is both a blessing and a curse for College English (CE) (hereafter referred to as CE) teachers and students to have so many information/knowledge resources which enable them to inquire further and find out more. The easy access to a sea of information from the mass media poses questions for both teachers and students. Questions like "What information do I need? What information is true?" must be answered when acquiring knowledge on the Internet. As for CE, how can teachers and students distinguish reliable online resources from misinformation and disinformation? What can teachers do with a huge number of views and attitudes on the Internet to help students think critically and make sound judgments? How can students enhance their English competence without losing their own cultural confidence? To resolve these primary concerns about information and Internet media, it is necessary to educate students to use media properly. Therefore, there is a need to incorporate media literacy education into CE. While cultivating students' media literacy in the context of CE, how to make this integration more effective and productive? The study reported in this paper suggests while we incorporate media literacy education into CE to enhance students'

language learning via digital communications, core values such as Chinese traditional culture core values should be highlighted to orient students in the vast sea of the digital world without losing their own cultural identity.

## 2. Issues of College Students' Reliance on Internet Media

From literature review we found that there are four major issues related to our college students' reliance on Internet media. First, college students cannot escape the media culture. They rely heavily on the Internet to acquire information, for entertainment and communication. Contrary to our expectations, most of them log on the net to entertain and have fun instead of online learning. Among their online activities, sending and receive instant messages, making phone or video calls, visiting websites, watching TV shows, listening to music, online shopping, etc., takes up most of their time. According to a study on college students' motivation of media exposure, only 32% of college students take learning and acquiring knowledge as the primary motivation. In sharp contrast, nearly 60% say they are keen on watching TV shows, movies, play online games, and chatting on social networks (Song & Liu, 2013). It is surprising to find only a small number of them log on to the Internet for academic purposes. Knowledge, in the sense of information as "the working capital" as Dewey puts it, is far from being properly utilized by college students.

Second, college students' situation of English learning on the Internet is not encouraging either. For one thing, although the Internet provides students with such a convenient channel of learning and communicating in English, they do not take the initiative of acquiring more. It is sad noting that most of their time is not spent on the Open courses on the Internet. Instead, their exposure to English is mainly in watching TV shows and movies in English. It is necessary to help college students learn to use the media efficiently to improve their

English competence. For another, while teachers and students may use digital media frequently for English learning, they face the challenge of the proliferation of misinformation which is entwined with real information on the Internet. For example, the numerous sources of news are both accessible and overwhelming. A simple practice of learning English from watching English news is a matter of value discrimination. For students, distinguishing which news content in English is reliable and which is not is most often beyond their ability. Since college students are still at their formative age, they are susceptible to all kinds of values. Those seemingly harmless content such as TV shows and talk shows the students binge-watch online are culturally heavy-loaded and play an undeniable role in shaping and reshaping their own values. Without proper instruction and guidance regarding media usage, they might fall victim to misleading values from which extreme behavior can stem and spread. It is therefore important to guide students safely through the maze of media by means of highlighting Chinese core values.

Third, college students' heavy reliance on social media platforms such as Wechat, Weibo and QQ, and other long-time online activities are highly likely to create symptoms of Internet addiction which refers to excessive Internet use that causes significant psychological and social disturbance along with functional impairment. Among them, problems like emotional fragility, procrastination, depression, and a decline in resilience among students leading to poor academic performance are noteworthy too (Gray, 2015). Thus, young adults as college students are, still need to be enlightened about the risks of over-exposure to media and other negative influences of media.

Fourth, there is a great need for adaptations in CE teaching in China with respect to educational technologies, especially Media technologies. The disparity between current CE teaching and educational technologies can be corrected through better knowledge and application of the media. Teachers need to bring in modern ways of teaching regarding technology and media. English teaching needs to change to meet the 21st-century challenges generated by a multitude of media forms. Therefore, the teaching pedagogy of CE has to keep up with the fast growth of media use. Although the communicative approach of language teaching has largely replaced the traditional grammar-translation method in CE classrooms, the teacher has always been in the dominant position while the students are the passive recipients. Now it is a different picture outside the classroom: media has become the second classroom providing students with more interesting, up-to-date and relevant language materials. The use of digital media as the source of learning is more convenient and low-cost. Within the context of learning in the digital age, students are no longer passive recipients but active explorers and even creators of their own social media platforms such as blogs and Wechat subscription platforms. By allowing students to choose and create on their own, their learning initiative is increased. As for teachers, their authority in terms of knowledge is challenged. A dictionary that a teacher uses is very likely no more comprehensive than a dictionary a student might use. To address this issue, it is not

realistic to turn teachers' heads into a Wikipedia. Instead, teachers need teaching skills of content mastery as well as integrating teaching with technology. In other words, there is a need to make a shift from content-based knowledge teaching to teaching students how to get the content they need by incorporating it with technology use. In this case, the teacher needs to be a constant learner, too. Since technology is a vital tool to enhance the learning of students in the digital age, it is vital then to prepare teachers with instructional technology which aims to help teachers in designing, developing, implementing and assessing instruction. In addition, as the communication between the teacher and student has become more convenient thanks to media technology, learning also takes place outside the classroom and curriculum. Thus, the use of media has become an indispensable part of teaching and learning. It is high time both teachers and students be trained in media knowledge and media use.

To solve above media-related problems, it is necessary to understand media technology and media use. In this case, media literacy needs to be included in the CE curriculum and be incorporated into college education, to meet the needs of social changes and CE situations in China.

### 3. Media literacy, Media Literacy Education and Integration of Media Literacy Education into CE

To include media literacy teaching in the context of CE in order to make the best use of the media and ultimately to enhance students' English proficiency, it is necessary to understand media literacy first. Media literacy is defined as "the ability to access, analyze, evaluate and create media in a variety of forms" by participants at the 1992 Aspen Media Literacy Leadership Institute. According to CML(Center for Media Literacy), "Media Literacy is a 21<sup>st</sup>-century approach to education. It provides a framework to access, analyze, evaluate and create messages in a variety of forms - from print to video to the Internet" (What is Media, 2008 ). UNESCO defines media education as the priority field of the cultural-educational development in the XXI century (Fedorov, 2008). These definitions of media literacy and media education help build an understanding of the role of media and the aim of media literacy education. As these definitions explain, media literacy is the ability to identify different types of media and understand the messages they are sending. The purpose of media literacy education is to cultivate such ability to navigate with competence in a world of media. This enables students to master the use of the media skills and learn to access media information and carry out independent critical thinking, which is exactly what Chinese college students need.

Second, let us have a review of the brief history of media literacy education worldwide. Nowadays media education has become important in many countries. Research on media literacy and its education began in the UK, France, and Russia as early as in the 1920s. In Germany, schools have integrated media education into the required curriculum and courses on media culture are offered in most universities. Canada, Australia, and the USA have a developed media

education too. Hungary became the first European country to introduce obligatory media education courses in secondary schools (Fedorov, 2008). In countries worldwide, primary schools, high schools and universities have all brought media education into their national curriculum and systematically taught knowledge about media in language courses, and other related courses. Contrasted with the fast progress of media education in other countries, it is still an emerging field in China. In 1997, the Chinese Academy of Social Sciences associate researcher Buwei published China's first paper about media literacy education: "On the Significance, Content and Methods of Media Education". It recalls the development of the concept of "media education" in western countries, which marks the prelude of China's media literacy education movement. In 2004, the first media literacy course in China was offered by Shanghai Jiao Tong University. However, the status of media literacy education in the Chinese education system still needs to be established and promoted at all school levels.

Third, let's focus on the integration of media literacy education into English teaching. Such integration has been practiced effectively in countries like the UK, USA, and Canada for decades. For example, in 1986 the British National Working Party for Primary Media Education stated clearly in its document that media literacy education is vital for the traditional purpose and concerns of English teaching. In 1999, media literacy courses became compulsory for language and literature majors in Canadian universities (Liu, 2016). In these English-speaking countries, English teachers are the main promoters and executants of media literacy education. Although in China English is taught as a foreign language, we can still draw on the experience of those countries which have implemented the integration of media literacy education into English courses and culture courses. The attempt to incorporate media literacy with CE in China is also promising if we take the Chinese context into account. The inclusion of media literacy education in college English teaching is consistent with the Chinese national College Teaching curriculum reform, which provides an opportunity for the development of integration of media literacy education and English teaching.

#### **4. Cultivating Media Literacy in CE through Highlighting China's Core Values**

As most studies and practices on media literacy education are conducted in the Western context except for a few studies investigating media literacy education in the Asian context, it is a challenge for Chinese CE to include media literacy education. The study of the integration of media literacy into English teaching is demanding due attention in the Chinese context. What are the essential considerations in the integration, i.e., the purpose of integration, what is the content of media literacy that can be included in the CE curriculum, what is the role of Chinese core values in cultivating media literacy in CE, etc.?

First, for Chinese college students, the aim of media literacy education is to understand the media, use the media and create the

media effectively on the cognitive level, critical level, and productive level. According to College English Curriculum Requirements, the objective of College English is to develop students' ability to use English in a well-rounded way, so that they will be able to communicate effectively, and at the same time enhance their ability to study independently and improve their general cultural awareness so as to meet the needs of China's social development and international exchanges. Obviously, these two objectives are highly compatible as the integration is practical and beneficial for learning of English, the international language used universally in the media.

Second, for college students, media in English is both the subject matter and the tool for English learning. Their English language proficiency can be enhanced, their cultural awareness can be improved, and their ability of independent thinking can be improved if they are educated properly in how to access, analyze, and critically evaluate different types of media in English. In addition, they can even properly create their We-media in English. We-media is a popular phrase for participating media - a cooperative, operator-produced complementary to the traditional media. Without media literacy, neither the content nor the form of We-media is possible. Media literacy education, therefore, when included in English education, is about helping students become literate, competent, critical, and productive in all media forms in English.

Third, now it comes down to pragmatics. What media competence can be cultivated to be integrated into CE teaching in the Chinese context? What are the essential considerations when the integration of these two is implemented?

For the question concerning what aspects of media literacy education can be integrated into CE, let us first look at the three major competences of media literacy. According to Livingston, etc., media literacy education aims to cultivate media competence in a wide area, mainly as the following: (Livingston, 2012)

The first area is basic functional or navigational competences (knowledge, for example, of how to use media as the technology to get useful materials). The second area is competence in controlling the technology (including advanced usage such as searching skills); The third area is the competence in regulating the technology (including issues such as protecting privacy, getting help when necessary, and filtering inappropriate conduct). The first area of functional competencies helps students establish access to media, which is out of the question for most college students. However, to cultivate the second and third area of competence for the purpose of English learning, it is not a simple matter. What are guiding principles in controlling and regulating the media for their English learning? How to distinguish the truth from falsehood which permeates the media? How can students insulate themselves from harmful or offensive media content? For these reasons, the essential factor of values should be considered as they decide the media users' choices. In the Chinese CE context, it is indispensable to maintain a healthy ecology of media and thus, to cultivate media literacy effectively through highlighting Chinese core values is necessary.

To be specific, Chinese core values here include Chinese traditional culture core values and contemporary core socialist values. The core values of Chinese traditional culture mainly refer to the values of Confucianism, Taoism and Buddhism. Confucianism emphasizes self-improvement, benevolence and morality; Taoism values laws of rules and movements; Chinese Buddhism advocates compassion and universality. Chinese traditional culture is the crystallization of the wisdom of the Chinese nation and is a manifestation of the historical heritage of the Chinese nation in real life.<sup>1</sup> With these traditional cultural values as the foundation, it is possible to guide students through multitudes of media loaded with values without being disoriented. Instilled in the students from an early age, these core values should be reinforced at the college level as well. These values are guiding principles for students and teachers. Media literacy education with an emphasis on Chinese core values will serve as an enabler for students and teachers to navigate the media safely and use the media productively. Through the study of core values of Chinese traditional culture in English, students can gradually build their own cultural identification and cultural confidence. As a result, their competence in controlling and regulating media use can be cultivated. If students achieve high media literacy, they will be more likely to become successful in English without losing their own cultural identity.

Other components of Chinese core values are core Socialist values, a set of moral principles summarized as prosperity, democracy, civility, harmony, freedom, equality, justice, the rule of law, patriotism, dedication, integrity, and friendliness. Chinese President Xi Jinping remarked, "Core socialist values are the soul of cultural soft power..." (Core Socialist Values, 2017). The Communist Party of China (CPC) issued guidelines for practicing core socialist values in 2013 as follows: "Core socialist values should be included in the overall national domains. Core socialist values should be incorporated into the curriculum and classrooms and made a way of thinking for students." Highlighting core socialist values in English teaching through media can help students distinguish between the various ideologies and values behind the media and resist the negative decadent values. Moreover, these core values can be guidelines for cultivation of students' character building and to minimize degradation and erosion of their national identity, which provide a safe environment for English learning. Therefore, both students' media literacy and language proficiency can be promoted.

In the practice of integrating media literacy in the English curriculum, Chinese traditional culture core values and contemporary core socialist values can be used as themes for all kinds of English learning activities. Students can be trained to explore these value themes in the multimedia resources before the teacher provides meaningful and relevant teaching materials for them. Text analysis and activities can be designed around core values too. Gradually, students will become more able to decode media texts independently and creatively and become more aware of the media environment and their roles in a world dominated by the media. In short, they will

become more able to take the advantage of the media, to access, analyze, evaluate and create media in a variety of forms.

This integration of media literacy into the English curriculum through highlighting the Chinese core values would not only stimulate students' progress in mastering English listening, speaking, reading, writing skills and intercultural communicative skills, but also help them succeed in cultivating their media literacy and encourage their critical thinking while keeping their own cultural confidence.

Just as John Naisbitt (1984) points out in his bestseller *Megatrends*: "We are drowning in information but starved for knowledge", it is urgent to take measures to protect students from being overwhelmed by the explosion of 21<sup>st</sup>-century media and provide them with tools to utilize the media for useful knowledge. Both teachers and students need to keep up with the development of media platforms and tools in the digital age. By suggesting highlighting Chinese core values in integrating media literacy into English teaching, it invites more attention to the issue regarding implementation and pedagogy of the integration.

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# Research on Effectiveness of Differential Leadership of Chinese Enterprises under Cultural Context

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**Abstract:** In view of the effectiveness of differential leadership, there are still controversies in academia. This study used meta-analysis techniques to explore the relationship between differential leadership and employee performance in the Chinese cultural context. Empirical studies were extracted with a total sample size of 5722. The results show that: first, there is a strong positive correlation between differential leadership and employee performance; second, there is no significant difference between differential leadership and employee in-role performance and employee out-role performance; third, different data sources influence the relationship between differential leadership and employee performance. Finally, the research deficiencies and prospects are proposed in the paper.

**Key words:** The meta-analysis, differential leadership, employee performance, moderating effect, Chinese enterprises

## 1. Introduction

Due to the influence of Chinese traditional culture, leaders' behavior of family business is more susceptible to the psychological impact of "insiders" and "outsiders", and different treatments are adopted for different employees. Zheng Bojun (1995, 2004) [1] [2] referred to this leadership style as "Differential Leadership". Recently, considerable case studies and theories have pointed out the characteristics of Chinese "differential" leadership. However, there is still no systematic study to explore this unique Chinese leadership style, especially the leadership style with strong partiality, which may affect the fair perception of subordinates intuitively. How it can persist in the long-term and effective in the Chinese business organization has become an important topic with controversial and worthy of exploring. For a long time, academic circles have discussed the effectiveness of differential leadership of Chinese companies from individual level (In order to meet the requirements of meta-analysis of the research samples, the object of this study is the differential leadership from individual level). Zhang Yizhen (2009) [3] used Taiwanese employees as the survey object to verify the positive correlation between differential leadership, employee loyalty, and employee performance. Yuan Ling, Li Jing, and Li Jian (2016) [4] taking Chinese mainland enterprises as research objects found that differential leadership is conducive to promoting employees' innovation behavior and proving the effectiveness of differential leadership. Since the R&D team in high-tech enterprises in the Pearl River Delta region of China, Zhou et al. (2016) [5] found that the differential leadership led to relationship conflict and task conflict between employees, thus reduced the R&D performance of employees. All along, more scholars (Zheng Bojun, 2009; Wang Lei, 2017) have clearly pointed out that due to the

influence of different research objects, different performance evaluation methods, sampling procedures, and errors, there may be some differences between the relevant research results.

Viewing of all above existed studies emphasizes that it is necessary to systematically analyze the related research to further explore the effectiveness of differential leadership. At the same time, this study believes that the meta-analysis method can bring multiple research results into integration through a certain method, expand the sample size, and the measurement error and sampling error can be effectively reduced or even eliminated, thereby obtaining more realistic and reliable research results. Previous research conclusions on the relationship between differential leadership and employee performance are not consistent, which provides the possibility of conducting a meta-analysis for this study. Therefore, this study intends to explore the effectiveness of differential leadership and examine the potential moderating effects of different performance types and different performance evaluation methods.

## 2. Basic Theories and Assumptions

### 2.1 Research on differential leadership

Differential leadership theory can be traced back to the "difference pattern" proposed by Fei Xiaotong (1948). Based on the employee classification model, Zheng Bojun (1995) defines differential leadership as leaders classify their subordinates as internal subordinates and external subordinates according to the standards of pro, loyalty, talent, and then treat internal subordinates and external subordinates differently. Compared with the external subordinates, the leaders will give internal subordinates more partial treatment from resource allocation and management methods. However, the current direct research on differential leadership is mainly concentrated in

Taiwan, and its research is still in the initial stage of development, Jiang Dingyu and Zhang Yuzhen (2010) [6] define differential leadership as a promoted reward, cared communication, and tolerated mistakes through deductive methods. Promoted rewards mean that leaders give internal subordinates more salary, benefits, and opportunities. Cared communication means that leaders and internal subordinates interact with each other in life and work more frequently. A tolerated mistake means that the leaders will give more tolerance and forgiveness to the mistakes of internal subordinates at work. Jiang et al. (2014) [7] further enrich the definition and measurement of differential leadership and think that the differential leadership should include three components of partiality, strictness for internal subordinates, and disgust for external subordinates, and make relevant measurements. Sun Xiaozhen (2014) [8] further explained the three components, pointing out that the leaders will give internal subordinates more participation in decision-making, promotion of rewards and tolerance, and at the same time, they also have higher expectations and requirements for internal subordinates, with more indifference and prevention for external subordinates. Xie Peiru (2015) and Wang Lei (2017) divide the differential leadership into two types as working type and emotional type according to resource theory and resource allocation rules [9]. Work typed differential leadership refers to the leaders who will give internal subordinates partiality treatment on the tangible work-related material resources. The emotion typed differential leadership refers to the leaders' private will give internal subordinates partiality treatment on the intangible emotion-related spiritual resources. In summary, both the theoretical construction of differential leadership and its measurement mechanism is subject to further exploration.

### 2.2 Differential leadership and employee effectiveness

The effective operation of the differential leadership in Chinese enterprises is maintained by the basic mechanisms of ethical norms, resource allocation, reward and punishment mechanisms, and social mobility. Viewing the different classification criteria for employees of differential leadership, in order to understand the effectiveness of differential leadership, its most critical logic should come from the discussion of the impact of differential leadership on employee effectiveness. As we all know, the research on the relationship between leaders and employees has been widely concerned by scholars at home and abroad. The relationship between leaders and employees has an important impact on employee effectiveness (Grant, 2012; Post & Byron, 2015; Wang Lin, Chu Xiaoping, Ni Wei, 2009; Lu Junting, Zhang Wei, Jia Ming, 2017; Gong, Huang & Farh, 2009; Zhou et al., 2016)<sup>[10][11][12][13][14][15]</sup>.

Social exchange theory believes that leaders treat employees differently and employees respond differently (Blau, 1964)<sup>[16]</sup>. Because the differential leadership will give more opportunities for internal subordinates, such as resource, promotion and raise (Jiang Dingyu, Zhang Yuzhen, 2010), so that internal subordinates will have the spirit of repaying their favor, and exchange with more positive work performance for the partiality treatment from their leadership

(Jiang Dingyu, Zheng Bozhen, 2014). Therefore, many scholars believe that differential leadership can promote the improvement of the effectiveness of internal subordinates. Jiang Dingyu and Zhang Yuzhen (2010) first proved this view with empirical research. Later, many scholars' research supported this conclusion (Wang Lei, 2013; Gao An, 2015; Tao Houyong, Zhang Juan, Li Ling, 2016)<sup>[17][18]</sup>. For the external subordinates, the interaction between the leaders and internal subordinates is the best alternative learning process. The external subordinates attempt to establish a good interaction with the leaders by observing and emulating the behavior of the internal subordinates (Zhou Lifang, 2006; Zheng Bozhen, 2004). In addition, many scholars use external group preference theory to explain the influence of differential leadership on the effectiveness of external subordinates. Jost, Pelham & Carvallo (2002) found that<sup>[19]</sup> low-level groups also have dissatisfaction with their own groups, and try to become close to the high-level group to become one of them, thereby generating external group preferences and improving employee effectiveness. Based on the above analysis, the first hypothesis of this study is proposed: *H1: Differential leadership is positively related to employee effectiveness.*

### 2.3 Moderated effect of different performance types

Katz & Kahn (1978) clearly stated<sup>[20]</sup> that employee effectiveness can be divided into intra-role performance and extra-role performance. Intra-role performance refers to employees' behavior defined by the organization's formal system. Employees work according to the tasks set by the organization's norms and perform performance evaluations accordingly (Cho & Johanson, 2008)<sup>[21]</sup>. Extra-role performance is employees' behavior defined by the non-organizational formal specification. This behavior beyond the formal norms of the organization and their own work, the behaviors that contribute to the behavior of supervisors, colleagues, and the interests of the organization are all extra-role performance (Newman, Nielsen & Miao, 2015)<sup>[22]</sup>. The academic circle generally believes that intra-role performance is important for the development of the enterprise, but the extra-role performance is more important for the long-term development of the enterprise (Organ, 1989)<sup>[23]</sup>. The improvement of the extra-role performance will also enhance the intra-role performance of the employee to some extent (Jiang, Zhao & Ni, 2017)<sup>[24]</sup>. The partiality treatment from differential leadership in Chinese enterprises will lead to the loyalty of internal subordinates, and internal subordinates are out of the spirit of gratitude and reward, will actively do their intra-role performance, but also show more extra-role performance for leaders and organizations (Organ, Podsakoff & MacKenzie, 2005)<sup>[25]</sup>. For the external subordinates, extra-role performance is also a good means of showing to leaders and the internal subordinates. In this process, they can also improve their acceptance of the internal subordinates and the recognition of their leaders, thereby reducing the transformed obstacles from outsiders to insiders. That is to say, under the different employee classification standards of the differential leadership in Chinese enterprise, its influence on the different performance types of internal subordinates

and external subordinates is more complicated. Therefore, the second hypothesis of this study is proposed. *H2: There are differences in the impact of differential leadership on the different employee performance types.*

#### 2.4 Moderated effect of different performance evaluation methods

In general, there are two ways to evaluate employee effectiveness, employee self-evaluation method and the others-evaluation method. On the one hand, due to the influence of social expectations and impression management, employee performance data obtained by the employee self-evaluation method may be overestimated, and the data obtained by the others-evaluation method will be relatively objective. On the other hand, the data obtained by the employee self-evaluation method may be homologous variance or common method variation (Organ, Podsakoff & MacKenzie, 2005), leading to false correlations between variables, resulting in a high correlation between differential leaderships and employee effectiveness. Therefore, the third hypothesis of this study is presented: *H3: Different performance evaluation methods have different impact on the relationship between differential leadership and employee effectiveness.*

### 3. Research Method

This study used the meta-analysis method to further test the proposed hypothesis (Hunter & Schmidt, 1990) [26]. The meta-analysis method is a statistical research method that can comprehensively analyze the results of multiple single empirical studies. Compared with independent empirical research, the advantages of the meta-analysis are as follows: (1) It can effectively expand the sample size without large-scale field investigation; (2) While effectively expand the sample size, reduce or even eliminate sampling error and measurement error, thus reducing research bias; (3) For some controversial related research results, meta-analysis can be used to draw more comprehensive and reliable research conclusions.

#### 3.1 Literature collection

According to the keywords such as "Differential Leadership", mainly searched from CNKI database, Weipu database, Wanfang database, Baidu academic and Taiwan Huayi library, Taiwan PhD thesis knowledge value-added systems, as well as Google scholar, etc. First, mainly searched literature with subject = "differential leadership" in CNKI, Weipu, and Wanfang. As of April 11, 2018, there were a total of 25 articles, excluding 3 articles not related to this subject and 9 journal articles in qualitative research, there were 5 journal articles in quantitative research and 7 PhD thesis. Secondly, searched all the columns = differential leadership in Taiwan Huayi library and Taiwan PhD thesis knowledge-added system, a total of 22 papers were retrieved, and 6 unrelated journal articles and 2 qualitative studies were excluded from the topic. There is only one quantitative study, but the quantitative research and the master's thesis belong at the same time, so a total of 13 effective PhD and master papers were retrieved. In addition, due to the protection of intellectual property rights in Taiwan, many documents have not been published,

and one of the retrieved ones has not yet been published (already obtained from the author). Finally, in the English databases such as ISI Web of Science, EBSCO, and EI, the search for "differential leadership" and "Chaxu leadership" only retrieved one document that fits the study. In summary, a total of 26 articles were searched for quantitative research on differential leadership.

#### 3.2 Literature filtration

The 26 quantitative research literature mentioned above were further screened. The criteria are: (1) must include the correlation coefficient or regression coefficient of differential leadership and employee performance variables; (2) employee performance including job performance, pro-others behavior, innovative behavior, knowledge sharing, and voice behavior, etc., (3) the research sample must be employees in Chinese enterprise; (4) the measurement of the differential leadership is based on the mature scale developed by Jiang Dingyu and Zhang Yuzhen (2010). According to the above criteria, a total of 11 articles were included in the meta-analysis, the detailed information of the 11 articles was in Appendix 1.

#### 3.3 Literature encoding

Encode the 11 documents above, including the author year, independent sample size, effect value, sample type, test method, independent variable, dependent variable, and regression coefficient. The effect value of each independent sample is encoded once. If the study contains multiple independent samples, the corresponding code is also multiple times. In the relationship report between differential leadership and employee effectiveness, different studies use different reporting methods. For the case where the overall correlation coefficient is not reported, only the correlation coefficient of the dimensions of differential leadership is researched, the method of calculating the arithmetic average gives the overall correlation coefficient. For the correlation coefficient of each dimension is not reported, only the regression coefficient of differential leadership and employee effectiveness is reported, this study will refer to (Peterson & Brown, 2005) [27] and apply formula (1), (2) for conversion.

$$R_{x_i y_i} = \beta_{x_i y_i} \times 0.98 + 0.05 \quad (\beta_{x_i y_i} \geq 0), \quad i = 1, 2, \dots, M \quad (1)$$

$$R_{x_i y_i} = \beta_{x_i y_i} \times 0.98 - 0.05 \quad (\beta_{x_i y_i} < 0), \quad i = 1, 2, \dots, M \quad (2)$$

After calculation, a total of 15 effective effect values of differential leadership and employee effectiveness were obtained. To reduce the occurrence of errors in the encoding process, the first and second authors simultaneously encode the encoded content. After the encoding work is completed, the encodings of the two authors are compared one by one, and the inconsistencies are corrected, and 15 independent effect values of 11 items are obtained finally.

#### 3.4 Calculation of the true effect values

(1) Correction of the correlation coefficient effect value. In order to correct the attenuation of the correlation coefficient due to the unreliability of the variables used, this study uses the method proposed by Hunter & Schmidt (1990) to correct the correlation coefficient

effect values.

$$R'_{x_i y_i} = R_{x_i y_i} / \sqrt{Cr_{x_i} Cr_{y_i}}, \quad i = 1, 2, \dots, M$$

Among them,  $R_{x_i y_i}$  is the effect value of differential leadership and employee effectiveness in each study,  $Cr_{x_i}$ ,  $Cr_{y_i}$  is the reliability of differential leadership and employee performance variables.

2(2) Fisher Z value calculation.

$$Z_i = \frac{1}{2} \ln \left[ \frac{1 + R'_{x_i y_i}}{1 - R'_{x_i y_i}} \right], \quad i = 1, 2, \dots, M$$

$R'_{x_i y_i}$  is the corrected effect value.

(3) Calculate the generalized inverse variance weighted average of Z.

$$\bar{Z}_i = \frac{Z_i(n_i - 3)}{n_i - 3}, \quad i = 1, 2, \dots, M$$

The number of studies in which the  $i$  effect value located is  $n_i$ , and the standard deviation is

$$Se_i = \frac{1}{\sqrt{(n_i - 3)}}, \quad i = 1, 2, \dots, M$$

(4) Calculate the true effect value.

$$\bar{R}_{Z_i} = \frac{e^{2\bar{Z}_i} - 1}{e^{2\bar{Z}_i} + 1}, \quad i = 1, 2, \dots, M$$

(5) Calculate the 95% confidence interval for the true effect value.

$$[\bar{R}_{Z_i} - 1.96/\sqrt{n_i - 3}, \bar{R}_{Z_i} + 1.96/\sqrt{n_i - 3}]$$

(6) Heterogeneity test.

$$Q = \sum (n_i - 3)(Z_i - \bar{Z}_i)^2, \quad Q = \sum [(n_i - 3)Z_i]^2 - \frac{[\sum (n_i - 3)Z_i]^2}{\sum (n_i - 3)}, \quad i = 1, 2, \dots, M$$

$$I^2 = \frac{Q - df}{Q} * 100\%$$

$df = M - 1$   $M$  is the total number of effect values.

#### 4. Analysis of Research Results

##### 4.1 Outlier test

Before performing the analysis, use SPSS 20.0 output box plot method to check outliers in the sample. In general, if there is an outlier in the input data, the box plot will be reported in the form of an asterisk '\*' or a hollow circle 'o'. The 15 corrected effect values of this study were input into the SPSS software. The output box plot is shown in figure 1. It can be seen that the 14th effect value is a hollow circle, indicating that an outlier is present in the study data. To improve the accuracy of the meta-analysis, the outliers are deleted.



Figure 1 Outlier test of effect values

##### 4.2 Publication bias test

To test whether there is a publication bias problem, that is there is no significant research conclusion relative, the conclusion of the

study is significantly easier to publish (Rothstein, Sutton & Borenstein, 2006)<sup>[28]</sup>. If there is a serious publication bias problem, meta-analysis will not be able to get general, universal conclusions. This study used two methods to test the publication bias problem: (1) funnel plot. Funnel plot is based on the principle that the larger the sample size is, the more accurate the effect value is, the width becomes narrower as the precision increases, and finally a symmetric funnel similar to the inverted one is formed. If there is a publication bias problem, the inverted funnel is asymmetrical and skewed. Figure 2 is a funnel plot for the study. The horizontal axis is the converted Fisher-Z value and the vertical axis is the standard deviation of Fisher-Z. It can be seen that most of the points are more evenly distributed around the top of the inverted funnel and near the average effect value, indicating that publication bias may be less in the meta-analysis; (2) fail-safe N. The fail-safe factor analyzes the index of publication bias from a quantitative perspective, that is how many unpublished and oppositely concluded studies can reduce the conclusion of meta-analysis to an insignificant level (Rosenthal, 1979)<sup>[29]</sup>. If the fail-safe factor is large, the likelihood of publication bias is smaller. The main hypothesis H1 proposed in this study under the confidence  $p = 0.05$  level, is calculated  $N = 3974$  according to CMA2.0. This indicates that 3,974 unpublished and oppositely concluded studies are needed to reverse this conclusion, as long as the fail-safe factor is greater than the critical value  $5 * k + 10 = 80$ , where the k is the number of effectors of 14, indicating that there is no publication bias in the study. In summary, there is almost no publication bias in this study.

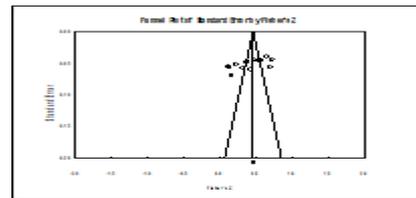


Figure 2 Funnel diagram

##### 4.3 Homogeneity test

To test whether there is homogeneity between the studies included in the meta-analysis, homogeneity tests were performed on 14 independent samples. The indicators of homogeneity test are Q-value, I-squared, and P-value. If the individual effect values are homogeneous, a fixed effect model can be used. If the individual effect values are heterogeneous, a random effects model is needed. In general, the random effects model is more accurate than the fixed effect model (Erez, Bloom & Wells, 1996; Cheung & Chan, 2005)<sup>[30]</sup><sup>[31]</sup>. The homogeneity test results of the meta-analysis are shown in Table 1.

Table 1 Homogeneity test of effect value results

Model	Number of effect values	Homogeneity				Tau-squared			
		Q	Df(Q)	p	I <sup>2</sup>	Tau <sup>2</sup>	SE	SD	Tau
Random effects	14	211.215	13	<0.001	93.845	0.038	0.016	0.000	0.194

From the results of the homogeneity test, it is known that

$Q=211.215$ ,  $p \leq 0.001$ , indicating that the effect value shows significant heterogeneity. At the same time,  $I^2=93.845$ , indicating that 93.845% of the observed variation is caused by the true error of the effect value. Only 6.155% of the observed variations were caused by random errors.  $\tau^2=0.038$ , indicating that 3.8% of the variation between studies could be used to calculate weights. Therefore, the effect values of this study are heterogeneous. When the effect value is heterogeneous, there are two ways to deal with it: (1) Deleting the extreme effect value until the homogeneity can be analyzed using fixed effect model; (2) Using the random effects model. This study relies on the recommendations of (Lipsey & Wilson, 2001) [32], using random effect model of analysis.

**4.4 True effect value**

CMA 2.0 software can calculate the true effect value, which is the correlation between differential leadership and employee effectiveness. It can be seen from the above analysis that when the effect value is heterogeneous, the random effect model should be used to calculate the true effect value. Table 2 shows the true effect values calculated using the random effects effect model for this study.

**Table 2 Results of random effect model analysis of true effect values**

Model	Number of effect values	Total sample number	Effect value and 95% confidence interval			Two-tailed test	
			Point estimate	Lower limit	Upper limit	Z	P
Random effects	14	5722	0.397	0.305	0.482	7.810	< 0.001

According to Cohen (1992) [33], in the field of behavioral science research, if the correlation coefficient obtained by the meta-analysis is  $\leq 0.1$ , the correlation coefficient is small. If the correlation coefficient is 0.25, the correlation coefficient is medium. If the correlation coefficient is  $\geq 0.4$ , the correlation coefficient is large. It can be seen from Table 2 that the overall correlation coefficient between the differential leadership and employee performance of this study is 0.397 ( $P < 0.001$ ), and the 95% confidence interval of the overall correlation coefficient is [0.305, 0.482], which does not include 0. The overall correlation coefficient passed the significance test. Therefore, there is a significant positive correlation between differential leadership and employee effectiveness, supporting the hypothesis 1 proposed in this study.

**4.5 Moderated effects test**

Table 3 (see Appendix 1) is the test result of the moderated effect of differential leadership and employee effectiveness. It tests whether different performance types and different performance evaluation methods moderate the relationship between differential leadership and employee effectiveness.

It can be seen from Table 3 that the effect value of the differential leadership on in-role performance (0.387) is less than the effect value of the differential leadership on out-role performance (0.407), but the homogeneity test of in-role performance (sample number 2821) and out-role performance (sample number 2901) was not significant ( $Q=0.046$ ,  $P=0.830$ ), indicating that the difference in the effect of differential leadership on different performance types was not significant in this study. Hypothesis 2 is not supported. No matter self-evaluation or others-evaluation, the accuracy of the evaluation mainly

refers to the credibility, effectiveness and stability of the evaluation results. Self-evaluation is an affirmative and negative judgment of individual's own situation. His evaluation is not a random evaluation of a single individual, but a result of statistical integration of multiple others' evaluations. In this study, the self-evaluation method (sample number 3817) for employee effectiveness is used to obtain the effect value (0.497) of the relationship between the two is higher than the effect value (0.245) obtained by others-evaluation. The homogeneity test results were significant ( $Q=14.158$ ,  $P < 0.001$ ), that is, the correlation between differential leadership and employee effectiveness was relatively high in the employee self-evaluation mode, and hypothesis 3 was verified.

**5. Conclusions**

**5.1 Research conclusion**

This study focuses on the special leadership style in the context of Chinese culture- differential leadership, based on the localized empirical research conducted by Chinese enterprises in the local area. The style of the differential leadership seems to lead to unfair perception of employees. However, it is common in Chinese society [34] [35] [36]. And the study is based on the meta-analysis method to explore the effectiveness of differential leadership in Chinese enterprises. This study verifies the positive correlation between differential leadership and employee effectiveness, and provides the strength coefficient of relationship between differential leadership and employee effectiveness, which provides theoretical basis and reference basis for the in-depth study of differential leadership in the future, and focuses on the discussion about the moderated effect of different performance types and different performance evaluation methods, hope to overcome the shortcomings of previous single variable research, and then reveal the influence mechanism of differential leadership on employee effectiveness. The main research conclusions are obtained through meta-analysis.

(1) There is a significant positive correlation between differential leadership and employee effectiveness. Hypothesis 1 has been proved. This conclusion verifies that the differential leadership of Chinese enterprises has a positive impact on the effectiveness of internal subordinates and external subordinates. The effectiveness of internal subordinates is based on the psychological motivation of the leader's "reciprocation" and the pressure of competition from outsiders. And the effectiveness of the external subordinates is based on the dual influence of the motivation of the leader's partiality treatment and the psychological pressure of dissatisfaction and unrest in the real situation. All of the above indicate that the unique differential leadership in Chinese society has a positive effect on the effectiveness of employee effectiveness and provides a useful reference for further research on the differential leadership and its effectiveness of Chinese enterprises.

(2) The difference in the influence of differential leadership on different performance types is not obvious, and hypothesis 2 has not been proved. The possible reason is that, as mentioned above, the in-

role performance and out-role performance are the same as the employee's effectiveness. The verification bias of the internal subordinates from differential leadership in Chinese enterprise will not only make it actively perform the in-role performance, but also will show more out-role performances for leaders and organizations. For the external subordinates, out-role performances are also a good means to show court for leaders and internal subordinates, thus reducing the transformed obstacles from external subordinate to internal subordinate. Therefore, under the effective differential leadership mode, in-role performance and out-role performance of the internal subordinates and the external subordinates will reach a certain dynamic balance. The influence of the differential leadership on the in-role performance and out-role performance may also achieve a certain dynamic balance, so as to achieve effective leading and balance of subordinates.

(3) The relationship between differential leadership and employee effectiveness is influenced by different performance evaluation methods, and hypothesis 3 has been proved. We found that the data obtained from the analysis of meta-analysis using self-evaluation method may indeed overestimate the employee's effectiveness to some extent, resulting in the relationship coefficient (0.497) between differential leadership and the employee's effectiveness using data obtained by self-evaluation method is higher than the relationship coefficient (0.245) obtained by others-evaluation method, indicating that the data obtained by self-evaluation may indeed overestimate the performance level of the subordinates and the relationship between the differential leadership and employee effectiveness. However, at the same time, this study believes that the self-evaluation may have more advantages in information sources, and the credibility, effectiveness and stability of others-evaluation results may be higher. Therefore, future research may consider different evaluation methods into integration.

### 5.2 Future research prospects

This study is the first attempt to conduct a meta-analysis of differential leadership and employee effectiveness. Relevant arguments may need to be included in meta-analysis for many times. At present, the number of literature discussing differential leadership and employee effectiveness is relatively small, and is subject to the protection of Taiwan's intellectual property rights, it is not very convenient for the collection and acquisition of literature in Taiwan and unpublished research, resulting in a small samples of moderated effects analysis. Based on the conclusions of this study, future research directions may include: (1) When the research on differential leadership is more adequate, more samples can be used to conduct meta-analysis of the moderated factors between differential leadership and employee effectiveness and the relationship between the two, which will get more convincing conclusions; (2) Research on the impact of differential leadership on employee effectiveness should pay more attention on the boundary conditions for the role of differential leadership; (3) The relationship between differential leadership and employee effectiveness is different due to the different

performance evaluation methods. In order to obtain more objective data in the future research, in addition to the self-evaluation method, it is possible to further optimize the integrated evaluation method by adopting a combination of employee mutual evaluation and leadership evaluation.

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**Appendix 1:** Table 3 Random effect model test of differential leadership and employee effectiveness

Moderated variables	Homogeneity			Category	Number of effect values	Total sample size	Effect value and 95% confidence interval			Two-tailed test	
	Q	Df(Q)	P				Point estimate	Lower limit	Upper limit	Z	P
Different performance types	0.046	1	0.830	In-role performance	7	2821	0.387	0.243	0.513	5.003	<0.001
				Out-role performance	7	2901	0.407	0.273	0.525	5.583	<0.001
Different performance evaluation methods	14.158	1	<0.001	Self-evaluation	8	3817	0.497	0.424	0.563	11.565	<0.001
				Others-evaluation	6	1905	0.245	0.127	0.357	3.995	<0.001

## Appendix 2. Samples Detail and Effect Values

No.	Authors (Year)	No.	Sample number <i>N</i>	Data resource (0 Other-assessment, 1 Self-assessment)	Dependent Variables	Employee Performance Types	Effect Value	Cronbach $\alpha$ of Independent	Cronbach $\alpha$ of Dependent
						(1 In-role /0 Extra-role)	$R_{xy}$	$Cr_x$	$Cr_y$
1	GAO (2015)	1	511	1	Voice Behavior	0	0.433	0.91	0.87
		2	511	1	Organizational Commitment	0	0.451	0.91	0.89
2	ZHANG (2014)	3	651	1	Job Satisfaction	1	0.487	0.916	0.807
3	WANG (2013)	4	334	0	Job Performance	1	0.11	0.87	0.87
		5	334	0	OCB	0	0.1	0.87	0.86
		6	290	0	Innovative Behavior	0	0.3538	0.87	0.92
4	YUAN, LI & LI (2016)	7	526	1	Innovative Behavior	0	0.54	0.841	0.923
		8	526	1	Job Involvement	1	0.435	0.841	0.917
5	WANG & DU (2017)	9	345	0	Innovative Behavior	0	0.3979	0.897	0.947
6	WANG & WANG (2017)	10	327	1	Job Performance	1	0.496	0.889	0.777
7	LIU (2015)	11	453	1	Job Involvement	1	0.32	0.9	0.929
8	LIU (2016)	12	384	0	Innovative Behavior	0	0.198	0.89	0.95
9	ZHANG & JIANG (2009)	13	312	1	Job Performance	1	0.27	0.94	0.84
10 <sup>1</sup>	Jianming Zhou, Shuo Liu, Xinsheng Zhang, Ming Chen (2016)	14	344	0	R&D Performance	1	-0.29	0.88	0.82
11	WU & JIANG (2011)	15	218	0	Job Involvement	1	0.14	0.93	0.88

# A Comparison of Joint Habitation with Property Sharing and Tenancy by the Entirety: Case Study

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**Abstract:** The Ye Daohe case (the Chinese case) and Sawada v. Endo case (the American case) demonstrated two completely different family property systems, namely joint habitation with property sharing, and tenancy by the entirety. Although both systems emphasize the integrity of the family property, there are still considerable differences. This paper analyzes their differences between family members from the aspects of the status of family members, the living conditions of family property, and the way of disposing of family property. On this basis, the paper further traces back to the source, and believes that these differences ultimately came from the social thoughts and social values it relies on. The Chinese take family interests as the center, and the American take personal interests as the center. They embody and maintain the differences between the two societies.

**Keywords:** Joint habitation with property sharing, tenancy by the entirety, comparison, case study

## 1. Introduction

Family property is different from pure material wealth in economic activities such as commodity trading, which can be measured by its equivalent. The most important characteristic of family property is that it is closely related to family ethics. The family property system reflects the ideal family lifestyle of people in a specific region and historical period, which represents the spiritual outlook of the mainstream of the whole society. It is also a good entry point to study the evolution of the family law traditions in various countries. The study of the family property system has positive academic significance in many fields such as law, sociology, and history.

This paper aims to present different characteristics between joint habitation with property sharing and tenancy by the entirety through all-round analyzing and comparing two real cases in history, which trace the process of their formations in the specific historical environment and find thought connotation, and the social value conveyed by each of the cases. This kind of research is a process of pursuing the essence of social phenomena from practice, and it adheres to the epistemology of dialectical materialism. It is also hoped that the outcome obtained from this study will be beneficial to the academic community.

## 2. Two Cases

*Ye Daohe* and *Sawada v. Endo* are two typical cases representing different family property legal traditions between China and the United States. Both involve the nature and division of family property, the reasonings of which convey clear ideas on the understanding of family property. Meanwhile, they are similar in many details, so there

is a basis for comparison.

### 2.1 The case of *Ye Daohe*

The case of *Ye Daohe* occurred in the 49th year of Qianlong (1784) during Qing Dynasty. It was reported that Ye Daohe was the magistrate of Yong'an Prefecture of Guangxi, and had been accused of involving in examination fraud, defiance of law and abuse of power for personal gain. According to the law, his family property should be confiscated by the officials. But, because Ye Daohe and his elder brother Ye Daozhong were living together in a big family which was not divided, the crux of the problem lay in how to determine the accurate scope of family property which should be confiscated into office.

This put the ruling into a dilemma. Firstly, it would be unfair for the innocent Ye Daozhong to confiscate all the property of the family. The reason was, "the brothers of those who have been convicted of crimes before are not involved in the crimes, so it would be unreasonable to confiscate the property belonging to innocent ones just due to crimes of convicted ones." [1] Secondly, the national law would not have executive force and authority, and at the same time, it would produce negative social effects, if Ye Daohe was exempted from confiscation just due to that there was no individual and specific property. Emperor Qianlong was so clear, "if the property belonging to criminals cannot be confiscated into office, due to that the family property was not divided, all the criminals will arbitrarily hide their properties with the excuse of the fact abovementioned, resulting in the common phenomenon that the descendants of corrupt officials still have rich wealth. So, how to give warning". [1]

Emperor Qianlong, as the supreme judge, did not follow any choice above. But based on insisting that brothers should share the whole family property, he made a more compromise decision, that was,

the officials should calculate every brother's property in family by temporarily dividing. The separate property which only belonged to Ye Daohe according to the calculation, should be confiscated into office. The Emperor Qianlong also made a rule in light of the judgment of the present case, that was, "if there is a similar case later on, when family property has not been divided and brothers' property shall be confiscated because of his own crimes, the whole family property shall be divided according to the number of brothers and each brother's property shall be calculated by shares. The property belonging to brothers who are committed of crimes shall be confiscated, whereas the property of other brothers who are not involved in crimes shall be remained." [1]

Accurately, from the modern view, Emperor Qianlong's contributions on Chinese traditional family property system was that he just established a method to solve the contradiction between individual property right which was owned by specific individuals and family property right which was owned by the family whole. The method did not deny the fact that the family property existing as a whole entity. The dividing family property was just assumption in specific circumstances. It did not change Chinese traditional family style.

### 2.2 *Sawada v. Endo*

*Sawada v. Endo* took place in 1977 and was decided by the Supreme Court of Hawaii in the United States. The cause of the matter was that, on November 30, 1968, Helen Sawada and Masako Sawada were injured by a motorcycle driven by Mr. Endo. Sawadas had filed lawsuits against him on June 17, 1969 and August 13, 1969 respectively for damages. They were eventually awarded a certain sum of compensation. But on December 17, 1969, Mr. Endo and his wife had conveyed a parcel of real property situate at Wahiawa, Hawaii, to their sons. The Sawadas asked the court to revoke the property conveyance. [2]

The key to analyze this issue was whether one of the spouses had divisible property interest in the marital property. If so, this part of the personal interest could be used as the execution target of the individual's external debts. The behavior of joint conveyance of the real estate was illegal. If not, the property which was not exclusive to individual naturally could not be the subject of the execution of the individual's external debts.

The Supreme Court of Hawaii firstly identified the nature of the marital property, holding that the marital property was an indivisible whole, which was the essential feature different from joint tenancy which could be divided according to voluntary alienation, or by levy and execution, or by compulsory partition. Secondly, the ownership of the marital property was one, which was owned by the legal unity of husband and wife, and neither husband nor wife could enjoy separate and divisible rights and interests to it. The property could not be used to pay debts incurred by one of the spouses without the other one's consent. [2]

Finally, after taking account of the marital property's positive significance for the integrity of the family, the court took a choice

among interests of injurer and victim, in other words, debtor and creditor. It, at the expense of the interests of creditors, made a judgment in favor of the integrity of marital property and the entire interest of the spouses as a whole family represented by the former, with denying the appeal to revoke the property conveyance by the spouses of Endo. [2]

### 2.3 Comparison of the two cases

The case of *Ye Daohe* took place in the late period of Chinese traditional society when the self-sufficient economic form was dominant. The judgment of *Ye Daohe* especially reflects the governance thought and legal spirit of Chinese traditional society. The living pattern of Ye Daohe and his brothers living together and sharing property is a typical representative of the traditional family. On the contrast, *Sawada v. Endo* took place in modern America, where the highly developed capitalist mode of production was dominant. Although the American law was deeply influenced by the British legal traditions, the laws related to the family relationship, which developed relatively slowly before, had realized the modernization at that time, and established the modern legal principles such as freedom of contract, equality of status, and self-responsibility. What *Sawada v. Endo* was involved in was the application of these modern legal principles to family property. *Sawada v. Endo* reflects the comparison and selection, at the level of public policy, among individual rights of husband and wife, the interests of the family as a whole and the interests of creditors.

#### 2.3.1 Similarity

Although the two cases were from different countries and times, they share great similarities. First, the facts show that the family property involved in the two cases is shared by more than two members. The scope of the property owned by a single member is not clear. The family property is faced with executive problems due to the external legal responsibilities of a single member. Secondly, in the aspect of reasoning, the reasonings of the two cases revolve around the following focus, that is, whether the individual has independent rights and interests in the family property, to fulfill the external property responsibility caused by his own behavior. This focus evolves forward into the question of whether family property can be divided. In the process of reasoning, both cases are based on the premise of self-responsibility and equal rights. Even in the case of *Ye Daohe*, which is a concentrated reflection of Chinese legal tradition, Emperor Qianlong emphasized the principle that, "innocent brothers shall not be correlated with ones who are committed to crimes", [1] making it clear that each family member shall take his own responsibility. As to the principle of equality in the process of dividing property, it unambiguously shows that all brothers have equal status in the enjoyment of family property rights.

In terms of judgment, the two cases seem different. *Sawada v. Endo* always adhered to the entirety nature of family property, whereas the case of *Ye Daohe* adopted a more flexible way of disposal, allowing nominal division of family property under specific circumstances, to realize personal property responsibility and balance

multiple interests. However, the case of *Ye Daohe* has never denied the legality of family's living pattern of living together and sharing property. Even the nominal division is temporary. Under non-special circumstances, family property is still an integral entity. Therefore, for the question of whether family property can be divided, the answers given by the two cases are consistent in principle. But the case of *Ye Daohe* makes further adjustments like the British equity justice at the level of practice.

### 2.3.2 Differentia

Although the integrity of family property and the equality of family members are the basic points of identification of the two cases, another question emerges. Do the two cases have the same understanding of integrality and equality? Does identity arise from the same requirements to make decisions?

Just from the details of the two cases, it is hard to avoid many doubts. The families in the two cases are composed of several people, but in the case of *Ye Daohe*, the main body of the family is Ye Daohe and his brother-Ye Daozhong, whereas in *Sawada v. Endo*, the main body of the family is Mr. Endo and his wife. Brothers and spouses obviously belong to different ethical relationships, respectively. From the nature of emotion to the rules of behavior, there are essential difference between the two relationships. So, the equalities existing in the two relationships are also different. Further, are there any difference in terms of nature and purpose of family property subject to different ethical relationships?

Adhering to the same concept of integrity on family property with *Sawada v. Endo*, the case of *Ye Daohe* introduced the method of calculating family property by average shares. The property of brother who was committed to crimes was cut off from the whole family property. Then, he could perform his own responsibility by his own property. That was the final solution for equality. On the contrast, *Sawada v. Endo* made different decision without compromise. Why did the two opposite judgments gain recognitions of their own society?

While thinking these questions above, it is also a process to understand the legal traditions of family property in China and the United States. Legal tradition is the precipitation of the historical development of legal norms and represents the stable social order and remarkable national spirit in a specific region. Therefore, the investigation to the two legal traditions of family property must be traced back to the historical environment in which the two cases were rooted.

## 3. The Basic Characteristics of the Two Systems

From the perspective of details, the family property systems involved in the cases of *Ye Daohe* and *Sawada v. Endo* should be two different systems applicable to different family life styles. By further analysis, their respective basic characteristics can be unambiguously displayed.

### 3.1 The meanings of the two systems

There are two kinds of family property system. One can be called joint habitation with property sharing centered on the agnation, the

other can be called and tenancy by the entirety centered on the equality between husband and wife. Such designations describe the most basic outlines of the two systems.

#### 3.1.1 Joint habitation with property sharing centered on the agnation

The case of *Ye Daohe* dates back to a Chinese traditional legal system, that is, descendants in a family are banned from living apart and owning individual property. *The Great Qing Legal Code* which applied to the case of *Ye Daohe* in the Qing Dynasty(1644-1912), clearly stipulated that, "where paternal grandparents and parents are living, the descendants who establish separate household registrations and divide the family property, will be punished with 100 strokes of the heavy bamboo." [3] It also made an exception, "where the paternal grandparents or parents approve, there cannot be a prosecution." [3] There are at least three meanings in the provisions. Firstly, it is living paternal grandparents and parents who hold the supreme power in a family. Secondly, when paternal grandparents and parents are still living, the descendants are obliged to protect their family's integrality. They shall not destroy the whole family. Thirdly, unless they have obtained paternal grandparents or parents' consent ahead, they do not have rights to live apart with their individual properties.

The legal system on prohibition of separating household registrations and dividing the family property had already been established in *the Tang Legal Code and Interpretation* in the Tang Dynasty(618-907). The punishment was more severe than that in *the Great Qing Legal Code*. According to *the Tang Legal Code and Interpretation*, regardless of whether paternal grandparents or parents approve or not, descendants who had one of the behaviors of "separating household registrations" or "dividing the family property" should be sentenced to 3 years in prison. [4] The severity of punishment for separating household registrations and dividing the family property was not limited to this degree. Emperor Song Taizu in the Song Dynasty(960-1279) prescribed, in the form of an imperial edict, "where crimes of separating household registrations and dividing the family property are being found by the magistrates of prefectures in Chuanxia area, ones who are committed to crimes above shall be sentenced to death penalty." [5]

It is undoubted that the behaviors of separating household registrations and dividing the family property is greatly denied in Chinese traditional society. Wang Kentang, a legal scholar in the Ming Dynasty (1368-1644), once commented on the behaviors of separating household registrations and dividing the family property. In his opinion, it was the most inurbane and unfilial to separate household registrations and divide the family property when paternal grandparents or parents were still living. If these behaviors are not strictly prohibited, the social morality and custom would collapse and would not return to be positive and fine. [6]

Since the behaviors of separating household registrations and dividing the family property were so unbearable, then living together and sharing family property became the norm in Chinese traditional families. The family in the case of *Ye Daohe* was the typical one. In

the family, two brothers—Ye Daohe and Ye Daozhong—were living together and sharing family property. In such a kind of family, the family property was a single and whole entity, not belonging to any single person. At the same time, both could spend out of the family property and all of properties they gained from outside of family also should be assembled into the family property. Anyone should not dispose the family property arbitrarily, such as individually selling, mortgaging, pledging without other's consent.

It is not unconditional for living together and sharing family property. The most important premise is that all the subjects should have the relationship of agnation based on same blood lineage, such as the relationships between father and children, grandfather and grandchildren, and brothers. Obviously, the family pattern is different from that just composed of husband and wife, and the scope of its subjects is also beyond the latter. Therefore, the Chinese traditional family property system revealed by the case of *Ye Daohe* can be described as joint habitation with property sharing centered on the agnation.

### 3.1.2 Tenancy by the entirety centered on equality between husband and wife

The subjects of family in *Sawada v. Endo* are husband and wife. In general, this kind of family pattern is formed through stable relationship by affinity between the two parties of marriage. What is completely opposite to the Chinese traditional family is that the subjects of family are not related by blood lineage. Therefore, the family property system based on the relationship between husband and wife refers to, in principle, husband or wife's rights and obligations, where the family property is possessed, used, or disposed. This has been discussed back and forth in *Sawada v. Endo*.

The court always emphasized that husband and wife not only were equal subjects of rights, but also held the whole family property in a single ownership. Neither of them could enjoy rights of the family property separately. The court further explained that, the husband's common law dominance over the family property had been abrogated under "the Married Women's Property Acts", meanwhile the wife had the same status as the husband in the exercise of rights over the family property. Without the consent of the wife, the husband should not separately transfer, lease, mortgage their family property, and the family property should not be the basis of credit for husband's debts.

*Sawada v. Endo* reveals the attitude towards family property that it not only belongs to the husband, but also belongs to the wife. When disposing of the family property, the husband shall not exercise the right just by himself but must exercise it jointly with his wife. To put it simply, to realize the equal interests of the wife, the family property rights must be inextricably owned and exercised jointly by the husband and the wife. The family property system revealed in this case is not for cohabitation, but for the purpose of allowing the wife to have equal status and rights with her husband. Therefore, the American family property system here can be described as tenancy by the entirety centered on equality between husband and wife.

### 3.2 The main differences between the two systems

The system of joint habitation with property sharing is adapted to the lifestyle of cohabitation among family members, whereas the system of tenancy by the entirety is adapted to the lifestyle of equality between husband and wife. Their purport is far from the same. The main differences are as follows.

#### 3.2.1 The basis of identity relationship is different

The system of joint habitation with property sharing is based on the agnation by blood lineage. It is a property system arising among people living together with the same ancestors. The status of family property on this basis is kept constant with the inheritance considering blood lineage. For example, in the case of *Ye Daohe*, the basis of identity relationship in the family is the blood relationship between Ye Daohe and Ye Daozhong. Therefore, the family suitable for joint habitation with property sharing has the feature of naturalness. Its formation and development observe natural regulations of blood lineage. Subjects of the family gain their identities just due to the fact of birth. They cannot change their identities according to their own will.

On the contrast, the system of tenancy by the entirety is based on marital relationship. During the marriage, the spouses are living together, and the family property arises. If they divorce, the family and the family property all disappear. So, the marital relationship and their identities can be changed according to their own will. Relatively, the status of family property is not so stable. For example, in *Sawada v. Endo*, the basis of identity relationship in Mr. Endo's family is the marital relationship between Mr. Endo and his wife. In contrast with brothers of Ye Daohe and Ye Daozhong, they can change their relationship and identities at any time, which are not controlled by blood lineage.

#### 3.2.2 The requirements of family property are different

This is an extension of the previous analysis. The Chinese traditional family, on which the system of joint habitation with property sharing depends, strictly observes the hierarchy system among relatives. Superior and inferior relatives do not have equal legal status in the family. According to their own status, they shall enjoy different rights and fulfill different obligations. In general, parents shall love their children and have the supreme power to manage the whole family, representing the family to behavior, whereas children shall be filial and have absolute obligations to obedient to their parents. Only brothers in the same generation are relative equal.

As mentioned above, the precondition of the prohibition of separating household registrations and dividing the family property is that paternal grandparents or parents are still living. Without considering specific exceptions, only if paternal grandparents and parents died, the brothers of the same generation can separate household registrations and divide the family property. Then the status of joint habitation with property sharing disappears with the family managed by paternal grandparents or parents. Unambiguously, it is paternal grandparents or parents at the highest rank in the hierarchy who maintain the life of the whole family. In other words, unequal

relationship is the prerequisite requirement of the system of joint habitation with property sharing. Of course, there are also many examples in history that brothers still lived together and share their property after their paternal grandparents or parents died. But the family pattern is just encouraging, not compulsive, then. The spirits contained in those examples are same with that in the circumstance analyzed above. It will be discussed in the later chapter.

As rules revealed in *Sawada v. Endo*, the system of tenancy by the entirety requires husband and wife to exercise their rights of family property together. Anyone does not have the ownership and cannot exercise rights separately and arbitrarily. Therefore, on the contrast to the system of joint habitation with property sharing, the equal legal status between husband and wife is the prerequisite requirement of the system of tenancy by the entirety. Once one of spouses can dispose of property separately without the consent of the other, it also means that the property right is no longer held by spouses as a single ownership, the family property has been broken down and the system of tenancy by the entirety is ineffective to them .

### 3.2.3 Family properties under the two system are disposed of in different ways

Under the system of joint habitation with property sharing, the family property is managed by paternal grandparents or parents at the highest rank, but not owned by him. It is also not owned by any other one in the family. Even all the family members cannot hold the ownership of the family property, who are just either manager or user. If a right owner is needed, from the perspective of modern legal thoughts, only the family is the owner of the family property. But the family is a collective concept, without characteristics of natural person or legal person. So, the owner is just nominal.

However, in accordance with traditional hierarchy system and law, paternal grandparents or parents of the family were entitled the right to manage and dispose of the family property, which inferior relatives do not have. The family property is more like a fund set up for the family with paternal grandparents or parents as trustees. For example, *the Great Qing Legal Code* stipulated that, “any inferior and younger person living together, who uses the family property without authorization of superior and older, shall be punished with 20 strokes of the light bamboo for 10 taels of property taken. For every 10 additional taels, add one degree. The total punishment is limited to 100 strokes of the heavy bamboo.” [3] Superior and older often refers to paternal grandparents or parents. For specific civil transactions, the law also stipulated that paternal grandparents or parents’ authorization is necessary for the invalidity of a transaction. As a case in the Song Dynasty has displayed, a man pawned family’s land, but the transaction was judged to be illegal, because the man did not tell his mother about the transaction. [7]

However, under the system of tenancy by the entirety, the owner of the family property is certain. There is only a single ownership on the family property. The owner is neither the husband nor the wife, but the legal unity of husband and wife. The legal unity can be regarded as legal person and has its independent legal status. Although

there is not a material entity like natural person, the existence of unity can be shown through the process of managing or disposing of family property. The dominant factor in the process is the consensus made by both of husband and wife. This is also the way of disposing of family property under the system of tenancy by the entirety.

Being different from the way under the system of joint habitation with property sharing, managers like trustees, who are members of the family, are not necessary. Both husband and wife jointly manage or dispose of family property equally. Without the consent of the other party, neither husband nor wife shall transfer the interests of the family property to others, let alone the division of the family property. All the disposals in breach of rules above are invalid and rights of external creditors will not be protected. As the court has judged, “the interest of a husband or a wife in an estate by the entireties is not subject to the claims of his or her individual creditors during the joint lives of the spouses.” [2]

## 4. “Public” and “Private”, Tracing the Social Value of Two Systems

The analysis of the basic characteristics only makes a superficial distinction between the two kinds of family property systems. To find deep reasons which have facilitated distinction, the social value that systems contain should be researched. Rooted in their own ideological and cultural systems, the two-family property systems have distinct genes since their birth.

### 4.1 Family collectivism in the context of Filial Piety

#### 4.1.1 “Filial Piety”, “Qinqin” and the practice

The thoughts of “Filial Piety” and “Qinqin”(to love blood relatives) in Chinese Confucian traditions is the ideological root of the system of joint habitation with property sharing. Respecting ancestors and extending blood lines are the basic value targets of Chinese traditional family. The lack of sacrifice in the ancestral temple means the decline and extinction of the family. Just like an ancient Chinese book, *the Book of Poetry*, says, “do not forget your ancestors, improve your morality”, [8] family cohabitation, prosperity of descendants, mutual help, adhering to dreams of the ancestors and realizing them, are the best comfort to the ancestors. This is the main ideas of filial piety to ancestors.

On the other hand, being harmonious with blood relatives, having compassion for them and supporting them are ethical principles deriving from the thought of filial piety. Because the blood relatives are offspring of the ancestors, to love blood relatives also means having not forgotten ancestors. It is also the way to express their filial piety to ancestors. In addition, on the view of ancients, only the one who loves blood relatives can respect ancestors, only the one who respects ancestors can unite the whole family. [9] Therefore, maintaining the integrality and solidarity of family is everyone’s main target and obligation to ancestors, and all start form loving his blood relatives.

The system of joint habitation with property sharing is undoubtedly adopted to the thoughts above. The cohabitation of a

large family has always been praised and encouraged. History books are full of records on this. For example, Zhang Gongyi, whose family members lived together for nine generations, was praised by the governments of the Northern Qi Dynasty(550-577), the Sui Dynasty(581-618) and the Tang Dynasty. [10]

Yang Chun, Taibao(one of the highest offices) of the Northern Wei Dynasty(386-534), said in his *Admonishment to descendants*, "I and my brothers, all eat together at home. When one is in the outside nearby, the others will wait for him to come back. If he does not come back even after midday, others will also wait for him with enduring hunger. I have 7 brothers, but now only 3 persons are still living. So we cannot bear to eat apart. I hope we do not live apart and anyone does not own individual property forever. That is all you have seen by yourselves. It is not false. If I hear that you and your brothers sometimes ate apart. This is not as good as my generation." The system of joint habitation with property sharing was adapted to material needs of family members in ancient times, meanwhile it maintained emotional relationship among family members. Therefore, the system consolidated the ethical concept based on blood lineage, which decided whether the relationship was intimate or distant, and the social order established on that.

#### 4.1.2 The "public"

From the perspective of the ideological origin and historical status of the system of joint habitation with property sharing, it is not set for private rights and interests since its birth. In the Chinese traditional society, with the family which was built and maintained considering blood lineage as the basic unit, the system of joint habitation with property sharing represents, orderly and harmonious, collective life among relatives. It requires them to insist the idea of "public" at all times.

It is recorded in *the Old Book on History of Tang Dynasty* that there was a man named Liu Junliang. His wife was discarded by him, because she persuaded him to divide the family property and leave his brothers in hard time. [10] Obviously, his wife was for private interest, which was reasonable and legal on the modern view. In addition, Liu Junliang's paternal grandparents and parents had died. Liu Junliang and his brothers could live apart and own individual property. But she was still regarded as evildoer who wanted to destroy their family. As the story mentioned before, Liu Junliang's family was praised by emperor thereafter. [10]

As the book described, every member of the family consciously did not possess any property. Everything belonged to the family. It could be said that in the scope of specific family, "public" was the main value every member should insist on. The wife's fault lay in that she gave up "public" and chose "private". It was "private" that could destroy the family. This story reveals that family members must have a strong emotional commitment to the integrity of the family, and that everyone should act in the interests of the family. Considerations of self-interest, "private", even if it is not detrimental to others, should be seen as the most direct challenge to the integrity of the family, that is, the life of family. Therefore, the ideal family only needs one

kitchen representing a single integral entity, which requires family members to integrate their own interests into the "public" interests of the family, which shall be maintained completely consistent with the latter.

Obviously, in the family, any private interests should be discarded, and each member should sacrifice themselves to realize the "public" interest of the family. Family members shall mutually celebrate for happy events and mutually support due to hardship, shall build ancestral temple to sacrifice ancestors, set up family school to educate descendants, open up public farmland to help the poor...[12] Just as the Japanese scholar Mizoguchi Yuzo said, "In this lineage society, the 'public' within the family (including jointly supporting, equally distributing and sharing) is attached special importance and is not allowed to be broken through the consciousness of private ownership." [13]

#### 4.1.3 The nature of "public"—collectivism

Is the concept of "public" the same as that in modern society? The answer is no! The "public" in Chinese traditional family does not apply to the whole world or most people. In contrast, its application is strictly controlled in the scope of specific family based on blood lineage, aiming to facilitate the specific family more promote harmonious, orderly, and prosperous, to expand and deepen the love among blood relatives. Therefore, this kind of "public" is limited. Compared with other families, it inevitably shows its "private" side. Where the family will deal with external affairs, it turned to be a subject for "private" interest. The "public" of Chinese traditional family is just familial "public", not social "public". The system of joint habitation with property sharing is just service for familial "public".

However, the "public" can be broken by the power outside family, that is, the power of the country called the largest family, which represents overriding "public" value. For specific purposes, the country may adjust or break the status of joint habitation with property sharing in specific family. As the case of *Ye Daohe* has clearly displayed, the mandatory partition of family property is to meet with the requirement of legal enforcement and national order. Emperor Qianlong assessed the judgment was supreme just and equal.[1]

In conclusion, although the system of joint habitation with property sharing is beyond individual's rights and interests, it cannot surpass social interests protected by government. It only reflects the collectivism limited within the scope of the family. The system and the value of collectivism are deeply rooted in the self-sufficient economy in Chinese traditional agricultural society. The family is a collective centered on blood relatives, with creating and enjoying wealth independent from other entities or country. Individuals are bounded in family in terms of identity and property, the free development of whom is denied. Therefore, the collectivism is narrow.

#### 4.2 Individualism in the context of equality

##### 4.2.1 Social background and ideological change

Early American law was strongly influenced by English common law. In colonial times, married women had no independent legal status.

They were not entitled rights to buy and sell property, operate business or any procedural right. [14] They even lost their personalities because of marriage. In the family, the wife and the husband were united as a single legal subject, and the wife's personality was merged into the husband's personality. The whole family was dominated by the husband, and the wife lived as the protection object of the husband. [14] The wife had no right or interest in property in the family, and all her individual properties before marriage would be owned, managed, or disposed of by her husband. [15] Only the husband could conclude or revoke the contract, while the wife has no right to restrain him. [14]

Since the mid-19th century, with the development of capitalist economy in the United States, the social status of women has undergone a huge change. Women have moved from the family to the public view. They began to participate in economic affairs and claim the right to family property. Especially after World War II, the economic boom brought large numbers of married women into the labor market, which changed the lifestyle of American families. [16] What followed was, women are more and more active in fighting for equal rights. The system of tenancy by the entirety was rooted in the social change caused by economic development. It directly reflected of women's claim of rights and ideological trend of gender equality in that times.

#### 4.2.2 The value contained in *Sawada v. Endo*

*Sawada v. Endo* was an echo to that times. The positive significance of *Sawada v. Endo* was that, in legal practice, it changed women's unfair state within the family and help them avoid the property loss due to unreasonable behavior of their husbands. It established the rules that the disposal of family property should not be unilaterally decided by the husband or wife, and neither party of them could separately enjoy property rights and interests in the family property, which adamantly supported and consolidated the equal legal status between wife and husband in the family.

Women's equal rights in the family, however, were not the direct grounds on which the judgment was based. In the judgment, the court introduced the concept of family integrity and compared it with the creditor's interest outside of family. It believed that an integrated and stable family was vital to the society, and thus concluded that the family property could not be partitioned unilaterally due to the creditor's interest outside of family. Finally, the court rejected the creditor's claim. It seems that the case was not related to women's rights, or the value it supported was family integrity instead of women's rights. Following this thought, someone would make sure that *Sawada v. Endo* was a violation of the spirit of protecting women's rights. But in view of the changed family lifestyle and the historical background of the struggle for women's rights, it might not be so. The purpose of introducing family integrity in this case was to emphasize that the family was not dominated and controlled by the husband unilaterally, and the integrity of the family was the integrity of husband and wife under the premise of independence and equality. The early American tradition of treating the husband as the sole legal personality of the family was broken. The husband was no longer

owner or manager of the family property, he could not dispose of the family property alone, and affect the interests of the wife in the family property. Whereas the wife could act as an independent legal individual to restrain her husband's behavior related to the family property. This was the meaning of family integrity introduced into the case.

Therefore, family integrity referred to the indispensability of the wife's rights in family property matters. It was dedicated to the goal of achieving the equal status and rights of the wife relative to her husband. In the era of feminism, the case showed the extreme state of the protection of the personal rights of the wife, and it was a thorough realization of the spirit of the protection of women's rights in family property matters. Protecting the interests of the family was only the way to achieve this extreme state.

#### 4.2.3 Private and individualism

It can be concluded that, compared with the system of joint habitation with property sharing, the system of tenancy by the entirety does not pursue "Filial Piety" and "Qinqin" in the family's collective life. Its aim is for the realization of individual "private" rights. If the American family is described as a contradictory unity in which the situation of husband and wife is opposite, then the system of tenancy by the entirety is the result of the pursuit of the balance of status between husband and wife, which in turn promotes the mutual respect and full development of individual rights between them. The system is individualism in nature.

However, it pursues individualism within the family so excessively that the legitimate rights of creditors outside of the family are sacrificed. As a result, the system of tenancy by the entirety seems to protect family members with external debts from prosecution. [17] This undoubtedly also creates barriers to the participation of married women in social and economic activities.

In addition, the system of tenancy by the entirety only applies to the family with regarding husband and wife as the main body. Compared with the system of joint habitation with property sharing in Chinese traditional family with strong collectivism, it lacks the function of relieving the urgent situation and helping the poor. Therefore, it is unavoidably insufficient in resisting external risks in the competitive socialized mass production era.

### 5. Conclusion

To sum up, the question at the beginning of the paper is not difficult to answer. Although there is a certain degree of similarity between cases *Ye Daohe* and *Sawada v. Endo*, the family property system contained in them is quite different. Although both emphasize the integrity of the family property, the system of joint habitation with property sharing is based on collectivism centered on agnation and blood lineage. Its property integrity has always been to maintain Chinese traditional family ethical order reflecting "filial piety" and "Qinqin". Property integrity represents complete filial piety to ancestors, complete love to brothers, as well as a continuation of the whole family. Whereas the system of tenancy by the entirety is based

on the equality between husband and wife, which is reflecting individualism. Its property integrity serves for the realization of individual rights in the family. The property integrity represents the integrity of the wife's legal personality, the realization of women's equal rights, and the balance of the status between husband and wife. As for family members, the idea of equality should be discarded under the system of joint habitation with property sharing, which cannot be absent under the system of tenancy by the entirety.

The two systems were greatly different in terms of characteristics, values, and ideological origins, but they both well matched the development needs of the society at their times. Each of them had already formed an inseparable and interdependent unity with their respective society. It is no wonder that, although the decisions of cases *Ye Daohe* and *Sawada v. Endo* are contradictory, have been accepted by their respective societies.

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# The External Effects of Community Education for the Elderly: Theoretical Logic and Empirical Analysis

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**Abstract:** Facing a global trend of population aging, community education as a quasi-public product for the elderly has been developed rapidly around the world. This paper argues that population aging has certain "internal effects" and "external effects". The study used the regression analysis method to undertake an empirical analysis on the spillover effect of the elderly participating in community education in Hangzhou and drew the corresponding research conclusions based on the theoretical logical analysis of the spillover effect of community education for the elderly. The paper also puts forward some suggestions to better promote the development of community education for the elderly in China.

**Keywords:** Education for the elderly, spillover effect, theoretical logic, empirical analysis

## 1. Introduction

Growth in the number of the older person is a global phenomenon. It is widely accepted that when the number of people aged 65 and above accounts for more than 7% of the total population in a country or region, it means that the country or region is aging according to the classification criteria of population aging and its socio-economic consequences of the United Nations in 1956. [1] Western developed countries such as France, Britain, Germany, etc. have generally entered an aging society before the developing countries. Since China entered the aging society in 2000, the degree of population aging continues to deepen. Coupled with the acceleration of the process of urbanization, it has put forward new tasks and requirements for creating a new society and building a new community. Community education for the elderly is one of the important aspects of the process of community construction. Besides, community education for the elderly has been paid more and more attention to the development of the aging population. Moreover, many scholars have studied it from different angles to varying degrees. [2] As a quasi-public product, community education for the elderly has certain "internal effects" and "external effects", but in the existing literature, there are few studies on the spillover of community education for the elderly, and even less literature on theoretical logic and empirical analysis. [3] As a consequence, this paper conducts empirical analysis with survey data by starting with the theoretical logical analysis framework and based on logical analysis.

## 2. Theoretical Logic Analysis

### 2.1 The definition of public goods in education for the elderly

The concept of public goods was first put forward by Adam Smith and Stuart Muller in their economic works. Additionally, its

formation was inspired by political scientists and philosophers such as Thomas Hobbes and David Hume. In 1954, Samuelson specifically mentioned public goods in his "Pure Public Expenditure Theory". Some western economics books have the definition of public goods, which are usually defined as non-competitive and non-exclusive products in the process of consumption. Non-competitive means that the consumption of public goods will not affect the consumption of public goods by others. In other words, the marginal cost of consumers is zero. Furthermore, non-exclusive means that the consumption of public goods is not limited to some people, or the interests of public goods cannot be divided.

Private products are competitive and exclusive in the process of consumption compared with public goods. However, there are many products between public goods and private products in people's real life. They have some characteristics of public goods and private products. However, they are not exactly the same, which are called quasi-public goods. Quasi-public goods generally have the characteristics of "crowding" and have a certain degree of competitiveness. Different from public goods, the marginal cost of consumers is positive, but not zero when the number of consumers increases to a certain number.

Brundle cleverly came up with a definition that can cover all products because of the narrow scope of public goods described by Samuelson, including all types of public goods. It can be expressed as (1):

$$S_i = S/P\theta \dots \dots \dots (1)$$

In the formula,  $S_i$  is the number of goods consumed by a member of a society;  $S$  is the total supply of goods;  $P$  is the size of the social population;  $\theta$  is the crowding factor, and  $0 \leq \theta \leq 1$ . If  $\theta = 0$ ,  $S_i = S$ , then the product is a pure public product; if  $\theta = 1$ ,  $S_i = S/P$ , then the product is a purely private product; if  $0 < \theta < 1$ , then the product is a quasi-public good with a certain degree of congestion.[1]

Education for the elderly is a kind of quasi-public goods according to the classification of public goods by Zhang Limin (2019) and the standard of commodity distinction. [2] On the one hand, educational products are competitive to a certain extent. The cost of educational products also increases with the increase in the number of elderly students consuming educational products. It is mainly the expenditure of teachers and educational facilities. Due to the increase in the number of elderly students, the expenditure on teachers' teaching and counseling and teaching facilities has increased. It means that the marginal cost of education is not equal to zero and has a certain degree of consumption competitiveness; On the other hand, the consumption of educational products is exclusive and restrictive. The elderly who does not pay tuition fees are easy to be excluded from education and have certain characteristics of private products.

### 2.2 The effective supply of education for the elderly

Effective supply means that the supply of products is consistent with the demand for products in economics. In other words, supply meets demand, and there is neither insufficient supply nor oversupply. Supply and demand together determine the equilibrium price and equilibrium output of products. The supply curve represents the marginal cost, that is, the opportunity cost that must be paid to produce the product. The demand curve represents the marginal utility, which can be expressed by the marginal price that consumers are willing to pay. The market supply curve represents the social marginal cost, the market demand curve represents the marginal social income, and the result of the competition between supply and demand curve forms the market equilibrium. The problem of effective supply discussed in economics can be summed up as the preference display of demand. As a rational economic man, consumers will clearly show their preference motivation, that is, individual demand. In addition, producers can meet this demand, so as to obtain the supply motivation of profit. In addition, producers turn this motivation into reality, and then the supply of the product is effective.

Samuelson puts forward Samuelson's conditions for the effective supply of public goods, see (2):

$$MRS_{AXY} + MRS_{BXY} = MRT_{XY} \dots\dots\dots (2)$$

Formula (3) can be derived from the price relationship of formula (2):

$$PAX + PBX = PX \dots\dots\dots (3)$$

As a public product, the supply efficiency of community education for the elderly depends on both supply and demand: On the one hand, the "consumer preference" of community education for the elderly. On the other hand, whether the supply mechanism of community education for the elderly reduces the cost and saves social resources. As a consequence, two problems need to be solved in order to realize the effective supply of community education for the elderly: One is to obtain the reasonable preference display mechanism of community education for the elderly, which can induce and show the real demand preference of the community elderly; The other is to introduce the competitive mechanism of supply to reduce the supply cost and stimulate the supply power.

### 2.3 The spillover of community education for the elderly

Consumers or manufacturers may be directly affected by other economic actors in some cases in economics, which is a kind of external effect. In economics, the part where the social cost is greater than the private cost is called the spillover cost. In addition, the part where the social benefit is greater than the private benefit is called the spillover benefit. This kind of phenomenon is collectively called the spillover effect. Private cost and private benefit refer to the calculation of the cost and benefit of the product from the point of view of the individual. Moreover, social cost and social benefit refers to the calculation of the cost and benefit of the product from a social point of view.

Public goods are generally provided by the government and can improve social welfare. As a consequence, public goods have positive externalities, that is, positive utility spillovers. The positive externality or spillover of quasi-public goods cannot realize its value through market transactions, and every member of society can enjoy the product for free or partly for free, which are similar to pure public goods.[3]

Since the 1980s, people began to pay attention to the internal and external effects of human capital with the birth of the new economic growth theory. The most representative is the endogenous economic growth model of Romer, 1986 and Lucas, 1988. The theory of endogenous growth emphasizes that economic growth is not an external force. However, the result of internal factors such as knowledge spillover, human capital investment, research and development (R & D), increasing returns, division of labor and so on. Lucas clearly pointed out for the first time that human capital has both internal effect and spillover effect. Internal effect means that human capital owners benefit from human capital and improve labor productivity. Spillover effect means that the level of technology or average human capital level will have an effect on the efficiency of all factors in production. In his opinion, the output of education comes from two parts: one comes from the contribution of material capital and effective human capital, that is, the internal effect of education or human capital. In addition, the other comes from the external income of human capital, that is, the spillover effect of educational investment.[4]

Community education for the elderly, as a kind of "quasi-public goods", has not only a certain "internality", but also a certain "externality", as well as social benefits in terms of nature. From the perspective of "internality", we can even obtain certain benefits through investment and education to complete the reproduction of its labor force, especially intelligence, and to improve individual quality and self-cultivation. At the same time, community education for the elderly has a strong "publicity", that is, it has a positive externality. In addition to improving social productivity, the externality of community education for the elderly is also shown as improving social cohesion, promoting family harmony, neighborhood harmony, improving community governance and promoting the development of social welfare undertakings. It is the spillover phenomenon of

community education for the elderly.

It is assumed that in the case of local equilibrium, the price vector  $p$  of  $m$  tradable commodities is given in order to further illustrate the spillover. There are  $n$  manufacturers produce externalities in the production process. In addition, setting the price vector  $p$ , we can determine that the induced profit function of manufacturer  $n$  is  $\pi_n(h_n)$ , where  $h_n$  is the level of externality it produces. There are  $I$  consumers whose utility function is quasilinear, and the induced utility function of consumer  $i$  is  $\Phi_i(k_i)$ , where  $k_i$  is the level of externality he feels. We assume that  $\pi_n(\cdot)$  and  $\Phi_i(\cdot)$  are twice differentiable, and  $\pi''_n(\cdot) < 0$ ,  $\Phi''_i(\cdot) < 0$ . There is positive externalities when  $\Phi'_i(\cdot) < 0$  for all  $i$ . There is a negative externality when  $\Phi'_i(\cdot) > 0$  for all  $i$ . [5]

**3. Model Building**

The Feder model is often used to measure the spillover effect of educational investment in the spillover mathematical statistics of education. The Feder Gershon model was proposed in 1983 to estimate the effect of exports on economic growth. [6] The Infield model mainly considers the labor force, not the retired elderly. As a consequence, the applicability of the model and the availability of statistical data are difficult. This study uses questionnaire survey data to construct a model of spillover effect of community education for the elderly in order to further verify the spillover effect of community education for the elderly. Based on the above logical analysis, a regression model is established, and the explained variables are set as the role of participating in community education for the elderly. Besides, the explanatory variables are gender, age, educational level, economic benefits, social harmony, beneficial health, social pension and so on. Then the model can be set to:

$$F(\text{Effect}) = f(\text{Gender, age, education level, economic benefits, social harmony, good health, social pension}) \dots\dots\dots (4)$$

Making specific changes to each variable. As a result, the form of the model can be expressed as

$$y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \beta_5x_5 + \beta_6x_6 + \beta_7x_7 + \varepsilon \dots\dots\dots (5)$$

The available models are as follows after finishing:

$$y = \beta_0 + \sum_{i=1}^j \beta_i x_i + \varepsilon \dots\dots\dots (6)$$

In the formula,  $y$  represents effect,  $x_1$  is gender,  $x_2$  is age,  $x_3$  is educational level,  $x_4$  is economic benefit,  $x_5$  is social harmony,  $x_6$  is beneficial to health,  $x_7$  is social pension,  $\beta_0$  is the intercept of regression line,  $\beta_i$  is the relevant variable parameter, that is, regression coefficient,  $j$  represents the number of variables (here is 7), and  $\varepsilon$  is random error disturbance term.

**4. Empirical Analysis**

**4.1 Data source**

The research group conducted a questionnaire survey by random sampling from October to November 2015 in order to understand the learning situation of community education for the elderly in HZ. A total of 250 questionnaires were distributed and 237 were returned,

with a return rate of 95%. The questionnaire is mainly based on multiple choice questions. According to the problem analysis and strict screening, 220 valid questionnaires are selected to meet the requirements of data statistical analysis. The questionnaire mainly involves four aspects: individual situation, family situation, participation in community education and learning and the expected effect of learning. Most of the elderly are female (56.8%) and 43.2% (male). Most of them are under 70 years old in the age structure.

**4.2 Variable description**

It is assumed that the role of participation in community education for the elderly is the explained variable in order to better analyze the effects of the elderly's participation in community education. It is carried out from the two dimensions of individual family characteristics and learning effect. and specific into seven influencing factors, namely explanatory variables. It is necessary to measure the correlation of the explanatory variables in order to improve the predictive power of regression analysis when using the method of multiple regression analysis. The smaller the correlation between the explanatory variables, the smaller the collinearity, and the stronger the predictive power of the analyzed variables. Pearson correlation coefficient test is used here, after measurement, the correlation of explanatory variables is less than 0.60. Moreover, the correlation between medium and low degree can be analyzed by regression.

**4.3 Reliability and validity measurement**

The reliability and validity of the data should be taken into account when conducting investigation and analysis and data statistics. Usually, the reliability measurement indicates a kind of reliability and consistency, which is expressed by Cronbach's  $\alpha$  coefficient method. if the  $\alpha$  coefficient is greater than 0.7, it means that the reliability of the questionnaire is high. After measurement, the Cronbach's  $\alpha$  coefficient of this survey data is 0.827, and the reliability of the questionnaire is high. Validity refers to the appropriateness of the questionnaire content, that is, the degree of consistency between the research theme and the questionnaire design content. It has been affirmed by relevant experts in the actual survey, has a theoretical basis, and the content effect is good.

**4.4 Reliability and validity measurement**

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**4.5 Empirical result analysis**

By adopting SPSS19.0 statistical software, the model is regressed by enter method, and the regression results are obtained. The specific results are shown in the table 1 and table 2 (see appendix 1 and appendix 2).

The effects of individual family factors and learning effect factors on elderly learners are significantly different, and the specific effects are explained as follows according to the regression results of the model:

Firstly, Gender, age and education level have a significant impact on participation in community education for the elderly among the individual family factors. There are differences among elderly scholars of different genders in dealing with community education. Male elderly learners are more sensitive and react more strongly to community education and training than female elderly learners in the actual survey. The evaluation of the role of participating in community education is more significant. However, the performance of female elderly scholars is not obvious. Among the elderly learners, the younger ones are more willing to participate in the community education than the older ones. In addition, they may have more free time soon after retirement. It has a higher evaluation and a more significant impact on the role of participating in community education. The role of participation in community education for the elderly is different in different levels of education. A higher level of education is, more aware of the significance and role of participation in learning is, whose impact is more significant.

Secondly, economic benefits, beneficial health and social harmony have a significant impact on it among the factors of learning effect. However, social pension has no significant impact on it. Some training fees will be charged according to the needs of curriculum and management in the organization process of community education for the elderly, which is generally not much. To a certain extent, it can reflect the economic benefits, and the impact is more significant. In terms of health, encouraging them to participate in community education for the elderly. On the one hand, they can learn some health knowledge, such as health care knowledge, psychological counseling knowledge, first aid knowledge, etc.; On the other hand, more elderly people study together can alleviate loneliness. It is beneficial to physical and mental health and has a significant effect. Elderly learners participate in community education, in which some familiar or unfamiliar neighbors participate, on the one hand, they can learn some knowledge of community governance, such as the handling of neighborhood and family relations, and have more opportunities to learn and meet with the elderly neighbors. Neighborhood relations will become better, and they will also get the support of their children. Neighborhood relations and family relations have become harmonious, which will bring benefits to the whole community and social harmony. However, the impact on it is not significant, it may be that the social pension is a systematic project, involving more aspects for the social pension. As a consequence, the impact on its evaluation is not significant.

## 5. Conclusion

The following three main research conclusions and enlightenment can be drawn through the theoretical logic and empirical analysis of the spillover benefits of community education for the elderly:

Firstly, the internal and external effects of community education for the elderly are very obvious. For example, the elderly has a very high evaluation of the role of community education for the elderly, and have a strong enthusiasm to participate. For themselves and their families, On the one hand, it is beneficial to the physical and mental health of the elderly; On the other hand, it is beneficial to family harmony, which is the embodiment of an internal effect. In terms of external effects, community is a community of social life formed by people gathered within a certain geographical range, the most basic organization and the foundation of society. The participation of the elderly in community education is beneficial to neighborhood relations, promote the construction of community harmony and benefit social harmony. In addition, it creates some economic effects to some extent. It is also a kind of spillover of internal effects, and the external effects are obvious.

Secondly, it is necessary to pay attention to the effective supply and demand of community education for the elderly. We should put "elderly students" into it, proceed from their actual needs, and understand the different needs of different elderly groups for the content of community education through market research in the design of community education curriculum. Moreover, it is necessary to design and develop courses that can attract them and meet their needs, design a community education curriculum system that integrates health, interest, art, science, and governance, and pay attention to their learning experience and feelings. We should implement the educational concept of "learner-centered". In the meanwhile, efforts should be made to create a high-quality and stable team of teachers with excellent business, dedication, and reasonable structure, so as to better serve the elderly learners and better reflect the effect of community education for the elderly.

Thirdly, striving for the support and attention of all parties. The development of community education for the elderly is inseparable from the support of the government, communities, and residents. It has been emphasized to build a learning society of national learning and lifelong learning and to promote a well-off society with all-round development of human beings since the 16th CPC National Congress. Community education is regarded as an important carrier and link in the construction of life-long education. The development of community education for the elderly is a system, which involves resources such as funds, venues, teachers, and environment. None of these resource elements are indispensable in order to do a good job in community education for the elderly. We need the support of many parties to form the joint force of these elements. Only in this way can we build a community education for the elderly that can effectively meet the needs of the elderly and give full play to its effect. Finally, it can promote the development of social harmony and life-long

education.

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**Appendix 1 (Table 1): Regression Result**

Model variable		Enter method				
		Unstandardized coefficient		Standardization coefficient	t	Significance
		Coefficient	Standard deviation			
$\beta_0$	Constant term	2.921***	0.189	—	15.463	0.000
$x_1$	Gender	0.066**	0.032	0.099	2.061	0.041
$x_2$	Age	-0.004**	0.002	-0.108	-2.126	0.035
$x_3$	Degree of education	0.056***	0.006	-0.492	-9.796	0.000
$x_4$	Economic performance	0.151***	0.051	-0.185	-2.965	0.003
$x_5$	Social harmony	0.202**	0.087	0.176	2.334	0.021
$x_6$	Healthy	1.103***	0.140	-0.696	-7.899	0.000
$x_7$	Social pension	0.013	0.100	0.010	0.130	0.896

**Appendix 2 (Table 2): Analysis of Variance Table**

Model	Sum of squares	Degree of freedom	Mean sum of squares	F statistical value	P value
Regression	13.939	7	1.991	42.058	0.000
Residual error	10.038	212	0.047		
Total	23.977	219			

# Optimization of Cake-Making Conditions with Potato Homogenate Based on Response Surface Methodology

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**Abstract:** This paper is an experimental report to study how to use potato homogenate to optimize cake-making conditions. In the experiment, potato homogenate, low gluten flour, and soft sugar were the main conditions. Other conditions include eggs, lemon juice, and baking powder. Response surface methodology was used to optimize the conditions for making cakes with potato homogenate. In the single factor experiment, the basic processing conditions of the potato homogenate cake were determined. Using the interaction of the three factors on the processing conditions of potato homogenate cake, the BBD experimental data was analyzed and processed by Design-Expert 7.0 software. The results show that the best conditions for preparing potato homogenate cake are as follows: the amount of potato homogenate is 103.4g, the amount of low gluten flour is 116.2g, the amount of soft sugar is 30.1g, and eggs, lemon juice, baking powder, corn oil, salt are added. Under certain baking conditions, compared with ordinary cakes, the cake made of potato homogenate has higher nutritional value, better color and taste, stronger flavor, and a unique potato flavor.

**Key words:** Potato homogenate, cake, response surface methodology, optimization of production conditions

## 1. Introduction

As the potato itself is rich in nutrients <sup>[1]</sup>, Western nutritionists list the potato as "perfect food", and for example the French regard the potato as the apple. With the implementation of the potato staple food strategy, 50% of potatoes will be consumed as a staple food in the future <sup>[2]</sup>. In recent years, more and more potato products have been developed as a staple food. In particular, the emergence of cakes and ShaQima products containing potato powder is more and more popular with the public. However, there are few studies on the production of potato homogenate products. The potato homogenization, is the potato peeled, put into the homogenizer, add a small amount of lemon juice, processing. Such treatment can not only reduce the waste of the raw materials but also improve the utilization rate of potatoes. This study is based on the basic conditions of the potato homogenate cake, using response surface methodology to optimize the production conditions.

## 2. Materials and Research Methods

### 2.1 Test materials and instruments

Fresh potato (peeled to make potato homogenate), low gluten flour, soft sugar, eggs, fresh lemon, corn oil, salt, baking powder, etc. All the above materials are purchased from the local Wal-Mart supermarket.

Instruments: Jiuyang wall breaking cooking machine (JYL-Y912), eggbeater (DR0802, Guangdong del Electric Appliance Co., Ltd.), electronic balance (CP214, Shanghai house), electric oven (SEC-3Y, Zhuhai Sanmai Machinery Co., Ltd.).

### 2.2 Production process of potato homogenate cake

Egg yolk, soft sugar, vegetable oil → stir → Egg yolk paste → Add potato homogenate, low gluten flour and lemon juice → stir → Mix flour paste → Into the mold → bake → Cooling, finished products, egg white, soft sugar, baking powder, salt → whip → Protein paste

### 2.3 key points of making potato homogenate cake

(1) The main purpose of peeling fresh potatoes and putting them into water is to prevent them from browning. In the process of making potato homogenate, a certain amount of lemon juice must be added to prevent the browning of potato homogenate.

(2) For the separation and production of egg yolk and protein paste, the time of protein passing should be enough. In the process of preparing egg yolk paste, the amount of potato homogenate and low gluten flour should be paid attention to, and the low gluten flour must be screened.

(3) When baking, attention should be paid to the baking temperature and time. In order to make a cake with a beautiful appearance and better expansion, cake paper is also needed.

### 2.4 Screening of single factor conditions for making potato homogenate cake

Through the test of the basic experiment, the weight of raw materials needed in cake making with potato homogenate was determined. Potato homogenate, low gluten flour and soft sugar were selected as the main conditions. The number of eggs, lemon juice, baking powder and so on is set as other conditions.

#### 2.4.1 Selection of potato homogenate dosage

The fresh potatoes were peeled, then cut into pieces and put into

the broken wall cooking machine. A certain amount of lemon juice was added for homogenization. After homogenization, under the condition of other baking conditions unchanged, 80g, 90g, 100g, 110g and 120g of homogenization were added. After baking, it was found that the best adding amount of potato homogenate was 100g.

**2.4.2 Selection of adding amount of low gluten flour**

In the case of 100g of potato homogenate and other conditions unchanged, the additional amount of low gluten flour was selected. 100g, 110g, 120g, 130g and 140g were added in turn, and the other baking conditions remained unchanged. After baking, it was found that the best addition amount of low gluten flour was 120g.

**2.4.3 Selection of adding amount of soft white sugar**

After determining the amount of potato homogenate and low gluten flour, the amount of soft white sugar was selected. The additional amount of soft white sugar is 30g, 40g, 50g, 60g, 70g in turn. Other conditions remain unchanged. When the addition amount of soft white sugar is 40g, the sensory evaluation score of potato homogenate cake is the highest.

Through the single factor experiment, the better production conditions of potato homogenate cake were obtained as follows: potato homogenate 100g, low gluten flour 120g, soft sugar 50g, eggs, lemon juice, corn oil and other appropriate addition, other baking conditions unchanged, the sensory score of potato homogenate cake was better.

**2.5 Optimization of processing conditions for potato homogenate cake by Response Surface Methodology**

**2.5.1 Construction of response surface model**

Based on the results of single-factor test, the response surface analysis test with three factors and three levels was designed by using Design Expert 7.0 software. And under the optimal production conditions of potato homogenate cake, related experiments were carried out. The test factors and levels are shown in Table 1.

Table 1 Response surface factor level

Levels coding	Factor		
	N <sub>1</sub> potato homogenate (g)	N <sub>2</sub> low gluten flour (g)	N <sub>3</sub> soft sugar (g)
- 1	90	110	30
0	100	120	40
+ 1	110	130	50

**2.5.2 Experimental design of response surface**

According to the principle of Box-Behnken central composite experimental design, on the basis of the single factor experimental results, the main factors affecting the production of potato homogenate cake were selected. They are potato homogenate (N1), low gluten flour (N2), and soft white sugar (N3). Then the response surface analysis method of three factors and three levels was used to design the response surface experiment with Design-Expert 7.0. The factors and levels of the experiment are shown in Table 2.

Table 2 Response surface test design scheme and results

No.	Variables		
	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>
1	0	- 1	- 1
2	- 1	1	- 1
3	1	0	- 1
4	0	1	- 1
5	1	- 1	0
6	0	0	0
7	- 1	1	0
8	- 1	- 1	0
9	0	0	0
10	0	0	0
11	1	1	0
12	- 1	0	1
13	0	0	0
14	0	- 1	1
15	0	1	1
16	1	0	1
17	0	0	0

**2.5.3 Analysis of variance of regression model**

The reliability of the quadratic multinomial regression model equation is expressed by R<sup>2</sup>, the statistical significance is tested by F-value, and the significance of linear effect, square effect, and interaction effect of influencing factors are tested by P-value in the model coefficient. The regression model of potato homogenate cake-making conditions and the significance of various parameters were verified.

**2.6 Sensory evaluation score table 3 of potato homogenate cake<sup>[3]</sup> is as follows:**

Table 3 Sensory evaluation score of potato homogenate cake

Projects evaluated	Criteria for scoring	score
Form and appearance	Full and complete appearance, no collapse, shrinkage, no breakage, scorched edge, stained edge	17-20
	The shape is relatively complete, with slight deformation, shrinkage, collapse and slight edge	13-16
	The shape is incomplete, including deformation, shrinkage, collapse, breakage, scorched edge and stained edge	0-12
Smell, taste	It has the unique flavor of cake and	17-20

	lemon fragrance, moderate sweetness and good taste	
	It has the flavor of cake, no lemon flavor, moderate sweetness and good taste	13-16
	The cake has a light flavor, no lemon flavor, a little fishy smell, and the taste is too heavy	0-12
color and lustre	The surface of the cake is golden and glossy, and the interior is light yellow without burnt	17-20
	The surface of the cake is light in color, dark in luster, yellowish inside and burnt	13-16
	The cake surface color is too light, the luster is dim, the interior is white, there is a burnt paste	0-12
Structure, texture	The interior is soft and dense honeycomb, without particles, hard lumps and big bubbles	17-20
	The interior is soft with a few particles and bubbles	13-16
	The internal structure is loose with particles and bubbles	0-12
texture	Soft taste, not dry, not sticky teeth	17-20
	Soft taste, slightly sticky teeth	13-16
	The taste is hard and sticky	0-12

NO.	sensory evaluation score of potato homogenate cake
1	85
2	88
3	80
4	81
5	82
6	89
7	79
8	86
9	91
10	90
11	83
12	80
13	89
14	78
15	86
16	88
17	92

**2.7 Sensory evaluation of potato homogenate cake**

The baked potato homogenate cake was sent to 15 food professionals for evaluation. According to the five aspects in Table 3 (i.e., the shape, appearance, smell, taste, color, structure, texture and taste of the cake), the sensory evaluation and scoring of the cake were carried out, and the final score was taken as the average value.

**3. Results and Analysis**

**3.1 Optimization of manufacturing conditions by response surface method**

**3.1.1 Regression model analysis of sensory score of potato homogenate cake**

It can be seen from the following Table 4 (see Appendix 1) that the regression of this model is extremely significant ( $P < 0.005$ ), among which the quadratic terms  $N1^2$ ,  $N2^2$ ,  $N3^2$ ,  $n1n3$ ,  $n2n3$  and  $N1N2$  in each factor have significant effects on the test results. The analysis of variance shows that the quadratic effect and interaction term are the most significant. Among them, the p-value of the mismatch term is  $0.1939 > 0.05$ , which indicates that the fitting degree of this model is good. The coefficient of determination  $R^2$  was 0.9392, and the coefficient of adjustment  $R^2_{Adj}$  was 0.8611, which showed that the model had a good fitting degree, and a small experimental error. The regression model could be used to determine the optimal technological conditions for making a cake with potato homogenate.

**3.1.2 Sensory evaluation score of potato homogenate cake**

According to the experimental design in Table 2, the sensory evaluation scores of potato homogenate cake were obtained, as shown in Table 5.

Table 5 Sensory evaluation score of potato homogenate cake

Regression analysis was conducted on the experimental data to obtain the correlation equation of the interaction effect of various factors. Further research and optimization were conducted on the influencing factors of potato homogenate cake making conditions, and three-dimensional and contour maps of response surface were made. After fitting the three factors, the quadratic multiple regression equation of sensory score of potato homogenate cake was obtained:

$$Y = 90.20 + 0.000N_1 - 0.25N_2 - 0.25N_3 + 2.00N_1N_2 + 4.00N_1N_3 + 3.00N_2N_3 - 3.10N_1^2 - 4.60N_2^2 - 3.10N_3^2$$

The interaction among the various factors is shown in the figure A, B and C below (see Appendix 2).

Comparing with figure 1, it is the response surface and contour map of the interaction between two influencing factors of potato homogenate cake. Through figure A, figure B and figure C, the influence of each factor and its interaction on potato homogenate cake can be directly reflected [4]. In particular, the shape of the contour line in the graph can reflect the strength of the interaction. The center of the contour line is oval, which means that the interaction between the two factors is significant, and a circle means that the interaction is not significant. In the above figure, the interaction between the amount of potato homogenate ( $N_1$ ) and the amount of soft white sugar ( $N_3$ ) is greater, and the amount of soft white sugar ( $N_3$ ) has a greater impact on the production conditions of potato homogenate cake, showing a relatively steep curve (Fig. 5B). The addition of low gluten flour ( $N_2$ ) had the second effect on the processing conditions of potato homogenate cake, and the addition of potato homogenate ( $N_1$ ) had the least effect on the processing conditions of potato homogenate cake. According to the model, the best processing conditions of potato homogenate cake in a stable state were predicted as follows: the amount of potato homogenate was 103.4g, the amount of low gluten flour was 116.2g, the amount of soft sugar was 30.1g, and the number of eggs, lemon juice, baking powder, corn oil, salt and so on were added appropriately. According to the above conditions, three parallel experiments were carried out, and then the cake was scored, and the

final score was 90. Under this condition, the potato homogenate cake has the best taste.

**4. Conclusion**

Potato homogenate was used as the main raw material to make potato homogenate cake. Through the research process, the proportion of raw materials and the optimization of baking conditions, the best production conditions were obtained as follows: the amount of potato homogenate was 103.4g, the amount of low gluten flour was 116.2g, the amount of soft sugar was 30.1g, and the appropriate amount of eggs, lemon juice, baking powder, corn oil and salt were added. Compared with ordinary cake, the cake made of potato homogenate has better color, taste, fragrance and nutritional value.

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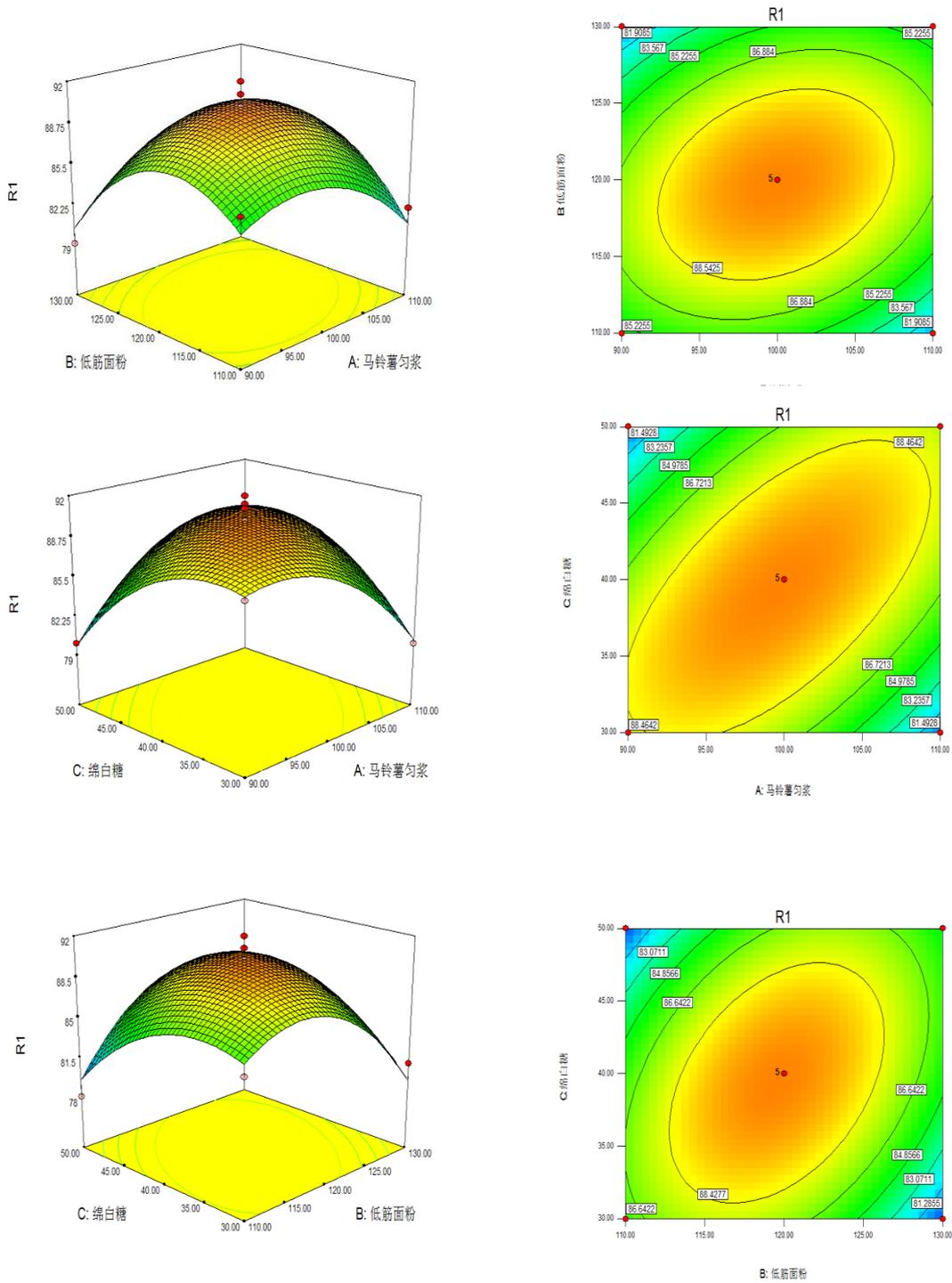
**Appendix 1: Table 4 Analysis of variance of regression equation**

Source	Sum of squares	Degree	Mean square	F-value	P-value	Significant
Model	305.96	9	34	12.02	0.0017	**
N <sub>1</sub>	0.000	1	0.000	0.000	1.0000	-
N <sub>2</sub>	0.50	1	0.50	0.18	0.6868	
N <sub>3</sub>	0.50	1	0.50	0.18	0.6868	
N <sub>1</sub> N <sub>2</sub>	16.00	1	16.00	5.66	0.0490	*
N <sub>1</sub> N <sub>3</sub>	64.00	1	64.00	22.63	0.0021	**
N <sub>2</sub> N <sub>3</sub>	36.00	1	36.00	12.73	0.0091	**
N <sub>1</sub> <sup>2</sup>	40.46	1	40.46	14.31	0.0069	**
N <sub>2</sub> <sup>2</sup>	89.09	1	89.09	31.50	0.0008	**
N <sub>3</sub> <sup>2</sup>	40.46	1	40.46	14.31	0.0069	**
Residual	19.80	7	2.83	-	-	-
Lack of fit	13.00	3	4.33	2.55	0.1939	-
Pure error	6.8	4	1.70	-	-	-
Cor total	325.76	16	-	-	-	-

$R^2=0.9392$   $R^2_{Adj}=0.8611$

Note: \*\*Very significant level, P<0.01; \*Significant level, P<0.05.

**Appendix 2:** Figures A (1 & 2), B (3 & 4), C (5 & 6) ( Note: A. Amount of potato homogenate and low gluten flour B. amount of potato homogenate and soft sugar C. amount of low gluten flour and soft sugar)



# Analysis of the Prescription and Compatibility Law for Ulcerative Colitis

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**Abstract:** The study aims to analyze the prescription and compatibility law for Ulcerative Colitis (UC) and provide a theoretical basis for clinical treatment of UC. The pertinent literature of China National Knowledge Infrastructure (CNKI) in the past three years was used as the basic information source of therapeutic prescriptions for UC. The drug use in prescriptions was standardized, and the screened prescriptions were analyzed by frequency and frequent itemset in data mining technology. Through data mining, this study finds that *Atractylodes Macrocephala* Koidz, *Coptidis Rhizoma*, and White Peony Root are core drugs in prescriptions for UC. There are 20 pairs of core compatibility. The general rules and characteristics of the Chinese medicine treatment for UC are summarized, which may provide references for the Chinese medicine treatment of UC.

**Key words:** Ulcerative colitis, prescription, compatibility law, Chinese medicine

## 1. Introduction

Ulcerative colitis (UC) is a non-specific inflammatory disease of the colon and rectum. It is with the features of a long course of the disease, difficulty in healing and high recurrence rate, etc. [1]. The lesions are limited to intestinal mucosa and submucosa, and symptoms of diarrhea, abdominal pain, and mucopurulent bloody stool, etc. are common. According to the symptoms, this disease is in the scope of "lingering dysentery, damp-heat dysentery and recurrent dysentery" of traditional Chinese medicine, etc. [2]. At present, western medicine mainly uses glucocorticoid immunosuppressors and biologicals, etc. to treat UC patients. However, the effects are not ideal. And there are many adverse reactions due to long-time medication [3]. In recent years, there have been more and more reports for the research of UC patient treatment by traditional Chinese medicine. Traditional Chinese medicine thinks that the pathogenesis of UC is spleen-stomach deficiency and retention of damp-heat, and there are the symptoms of intermingled deficiency and excess and vital energy deficiency with evil-lingering. Therefore, it is required to take addressing both symptoms and root causes and strengthening the body resistance to eliminate pathogenic factors as the basic principles. There are also considerable literature and reports verifying that Chinese herbal medicine compound preparations are relatively effective to UC [4-6]. However, the pathogenesis of UC is relatively complex, many clinical doctors have summarized different patterns of syndrome and prescriptions. This paper summarizes and analyzes prescription and compatibility law for UC by using statistical method to provide valuable reference information to treatment of UC by traditional Chinese medicine.

## 2. Research Methods

### 2.1 Prescription information source and screen

(1) Source: The pertinent literatures of China National Knowledge Infrastructure (CNKI) were used as the basic information source of therapeutic prescriptions for UC. Firstly, the key words of "ulcerative colitis", "Chinese medicine" and "compatibility law" were entered to select the relevant literatures (including the complete information of name of prescriptions included, ingredient, function, and indication, etc.) of recent three years. All the names of Chinese medicines were based on the name recorded in *Chinese Pharmacopoeia* [7].

(2) Prescription information screening criteria: The literatures where the treatment by oral Chinese medicine was effective, there was control of positive medicine and the curative effects of the prescription was with significant advantages indicated by statistical treatment; The literatures where overview, descriptive research and animal experiment and cases <30 were excluded; The literatures whose researches used Chinese medicines to cooperate with other treatment schemes, however, for the results, the effectiveness of other treatment schemes cannot be eliminated, were excluded. The literatures which were without complete pharmaceutical ingredients or whose prescriptions were confidential were excluded; the literatures with obvious traces of copy were eliminated. At last, there were 98 literatures complying with the screening criteria screened.

(3) Classification of common UC patterns of syndrome of traditional Chinese medicine: In accordance with relevant literatures, there were six common UC patterns of syndrome of traditional Chinese medicine included in this study, including incoordination between the liver and the spleen, intertwist of cold with heat, spleen-kidney yang deficiency, spleen-stomach deficiency and qi stagnation

and blood stasis.

## 2.2 Data analysis method

Descriptive statistics were used to analyze the frequency of the Chinese medicine data information in prescription. Excel 2003, Access2003 and Epi Data 3.1 were used to record and sort data. At the same time, Logical proofreading was conducted. The commonly used Chinese medicines, their flavor and meridian tropism were analyzed by frequency. Frequency of Chinese medicine means the times of a Chinese medicine appearing in the prescriptions. In the research, cumulative frequency was expressed by cumulated downward frequency (the frequency of each group was accumulatively calculated from the group with high variable values to the group with low variable values). Cumulative number meant the cumulative frequencies above the lower limit of each group. This study mainly reflected the frequency of the Chinese medicines which were frequently used and the proportion of the frequency in overall frequency; Analysis of frequent itemset (a method commonly used for mining technology, it means the itemset whose support degree  $\geq$  the minimum threshold value of support degree designated by users), while the itemset meant the set of the Chinese medicines in the prescription. Mining analysis was conducted for the usage pattern of the medicines commonly used in the prescription by frequent itemset. The relevant screened literatures were sorted, and the names of the Chinese medicines were standardly processed and uniformly coded.

## 3. Results

### 3.1 Analysis of the quantity of the Chinese medicines used in prescriptions and composition of Chinese medicine frequency for UC patients

A total of 198 prescriptions for UC were analyzed. There were at least 4 Chinese medicines in prescription drugs, and at most 80 Chinese medicines. There were 256 Chinese medicines in 198 Chinese medicine prescriptions. The total frequency of the drugs was 3,586 times. Chinese medicines of which the frequency of medication exceeded 40 times from high to low were as shown in Table 1 (see appendix 1), wherein, the rank of the Chinese medicines of which the frequency of medication exceeded 40 times from high to low were as follows: radix glycyrrhizae, atracylodes macrocephala koidz, coptidis rhizoma, poria cocos, white peony root, costusroot, radix codonopsis, astragalus, angelica sinensis, coix seed, citrus, yam, etc.

### 3.2 Analysis of the combination law for prescription medicine compatibility

In the prescription for UC treatment, the drugs with the most frequency compatibility were coptidis rhizoma and costusroot. There were 20 pairs of core compatibility screened. The involved common Chinese medicines include coptidis rhizoma, costusroot, white peony root, radix glycyrrhizae, angelica sinensis, atracylodes macrocephala koidz, scutellaria baicalensis and coix seed, refer to Table 2 (see Appendix 2).

### 3.3 Analysis on frequency of five drugs for different patterns of syndrome of traditional Chinese medicine for UC

For patients with incoordination between the liver and the spleen type of UC, drugs with bitter taste and sweetish taste were frequently used. For patients with intertwist of cold with heat type, spleen-kidney yang deficiency type, spleen-stomach deficiency, qi stagnation and blood stasis type of UC, drugs with bitter, sweetish and pungent taste were frequently used, refer to Table 3 (see Appendix 3) for details.

## 4. Discussion and Conclusion

Data reports indicated that, the incidence rate of UC in North America is about 19.5/100,000, in Europe was 243/100,000. In China, the incidence rate of UC increased year by year. UC has become a public health problem of the world [8]. Modern medicine thinks that, UC incidence is closely related to the factors of immunization, heredity and infection, etc. UC is a kind of disease hard to be cured. Due to the complex disease status, relatively long course of disease and easy relapse, the efficacy of regular western drug therapy for UC patients is not ideal [9]; There is no record about UC in traditional Chinese medicine. However, in accordance with the clinical symptoms the patients, it can be divided into the scope of "recurrent dysentery and lingering dysentery", etc. Traditional Chinese medicine thinks that, the pathogenesis of this disease is deficient root, excessive superficialities and intertwist of cold with heat. Deficient root means weak spleen and kidney, excessive superficialities means damp-heat, qi stagnation, phlegm, blood stasis and toxin stasis, etc. There are the symptoms of intermingled deficiency and excess and vital energy deficiency with evil-lingering in clinic, therefore, it is required to take addressing both symptoms and root causes and strengthening the body resistance to eliminate pathogenic factors as the basic principles [10]. Research has verified that, Chinese medicines, especially compound preparations of traditional Chinese medicine, had specific advantages for UC treatment [11]. And in recent years, there have been many literatures and reported about UC treatment by Chinese medicines published. For examples, the research of Dai Gaozhong, et al. [12] verified that, the decoction of root of Chinese pulsatilla was with specific clinical efficacy for UC patients with enema. The research of Zhang Bo, et al. [13] indicated that, pinelliae decoction for purging stomach-fire can greatly improve the efficacy of clinical treatment for chronic UC patients with enema. Even so, at present, the recognitions of the hospitals to the etiology and pathogenesis of this disease are different, and ideals on medication are also different. Hence, prescription and compatibility law for UC patients has become the focus of clinical study. This paper conducted summary and analysis to the literatures published in China National Knowledge Internet to explore the medication features and compatibility laws of the prescription of oral Chinese medicines for UC patients.

The results of this study indicated that: A total of 198 prescriptions for UC were analyzed. There were at least 4 Chinese medicines in prescription drugs, and at most 80 Chinese medicines. There were 256 Chinese medicines in 198 Chinese medicine prescriptions. The total frequency of the drugs was 3,586 times. Wherein, the rank of the Chinese medicines of which the frequency of

medication from high to low were as follows: radix glycyrrhizae, atractylodes macrocephala koidz, coptidis rhizoma, poria cocos, white peony root, costusroot, radix codonopsis, astragalus, angelica sinensis, coix seed, citrus, yam, etc. It was indicated that, the drug with the highest frequency in the prescription for treatment of UC by traditional Chinese medicine was atractylodes macrocephala koidz, and then radix glycyrrhizae and coptidis rhizoma. Radix glycyrrhizae is a common drug for blending. Therefore, its high frequency is not at all surprising. Atractylodes macrocephala koidz is a necessary drug for the functional activities of the spleen manifesting in normal transformation and transportation. Excepting for the functions of dehumidifying, tonifying qi, regulating the middle warmer and tonifying spleen, it is also used for benefiting qi and blood and used in the nourishing prescription<sup>[14]</sup>. Traditional Chinese medicine thinks that, the onset of UC is related to deficient root and excessive superficialities, intertwist of cold with heat, weak spleen, and kidney. damp-heat, qi stagnation, phlegm, blood stasis and toxin stasis, etc. Treatment shall be mainly functional activities of the spleen manifesting in normal transformation and transportation, dehumidifying and tonifying qi, etc.<sup>[15]</sup>. Therefore, atractylodes macrocephala koidz is most frequent used in the prescriptions for treatment of UC patients; The study also found that: In the prescriptions for UC treatment, the most frequently used drugs in compatibility were coptidis rhizoma and costusroot, indicating these two were with the highest compatibility relation in the prescriptions for UC treatment. Coptidis rhizoma is bitter cold, and it is with strong ability of heat-clearing and damp-drying, hence, it is necessary for stomach and intestine damp-heat and diarrhea; Costusroot is fragrant, warm, and dry. It can rise and fall qi and eliminate obscure complexion in large intestine. The combination of these two drugs can clear heat and dry damp and promote the circulation of qi and eliminate obscure complexion. So, these two drugs are the core drugs for UC patients<sup>[16]</sup>; In addition, this study screened 20 pairs of core Chinese medicines, involving coptidis rhizoma, costusroot, white peony root, radix glycyrrhizae, angelica sinensis, atractylodes macrocephala koidz, scutellaria baicalensis and coix seed, etc. Every two drugs were with compatibility. The positions of UC are large intestine, spleen, liver, kidney, and lung, therefore, the drugs for liver channel, spleen channel, stomach channel and large intestine channel are used. By this, the basic components for treatment of UC patients can be obtained<sup>[17]</sup>; This study also analyzed the medication frequencies of the UC patients with different patterns of syndrome of traditional Chinese medicine. The results indicated that, UC patients of incoordination between the liver and the spleen type used more bitter taste and sweetish taste drugs, while UC patients of intertwist of cold with heat type, spleen-kidney yang deficiency, spleen-stomach deficiency and qi stagnation and blood stasis type used more bitter taste, sweetish taste, and pungent drugs. Wherein, bitter taste drugs can relieve, dry, and solidify, they are with the functions of clearing heat-fire, depressing qi, reducing internal heat, eliminating dampness, purging intense heat, and saving yin, etc. Sweetish taste drugs are with

the functions of tonifying, regulating the middle warmer, pressing and alleviating pain. And pungent drugs are with the functions of scattering and promoting<sup>[18]</sup>. Excepting for this, the use of heart channel drugs can clear away the heart-fire, warm the middle warmer and remove stasis. Hence, the dialectical medication for the UC patients by traditional Chinese medicine are mainly bitter, pungent and sweetish drugs.

Traditional Chinese medicines are with specific advantages for UC treatment. By acquiring proficiency in medication and compatibility laws of UC prescription and flexibly using these drugs, the application prospect of traditional Chinese medicine in UC treatment can be improved.

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**Appendix 1:** Table 1 Analysis of Frequency of Main Chinese Medicines for UC Patients

Drug name	Frequency	Proportion in prescription (%)	Cumulative frequency	Proportion in total frequency (%)
Radix glycyrrhizae	162	81.82	162	4.52
Atractylodes macrocephala koidz	153	77.27	306	4.27
Coptidis rhizoma	132	66.67	432	3.68
Poria cocos	123	62.12	598	3.43
White peony root	122	61.62	732	3.40
Costusroot	106	53.54	816	2.96
Radix codonopsis	93	46.97	963	2.59
Astragalus	87	43.94	986	2.43
Angelica sinensis	78	39.39	1079	2.18
Coix seed	76	38.38	1135	2.12
Citrus	70	35.35	1263	1.95
Chinese yam	59	29.80	1326	1.65
Root of Chinese pulsatilla	53	26.77	1436	1.48
Scutellaria baicalensis	48	24.24	1523	1.34
Cortex phellodendri	39	19.70	1639	1.09
Saposhnicovia divaricata	39	19.70	1736	1.09
Radix paeoniae rubra	36	18.18	1768	1.00
Radix bupleuri	34	17.17	1799	0.95
Fructus evodiae	32	16.16	1832	0.89
Fructus amomi	29	14.65	1998	0.81

**Appendix 2: Table 2 Analysis of Combination Law for Prescription Medicine Compatibility**

Node I	Node II	Frequency
Coptidis rhizoma	Costusroot	652
White peony root	Coptidis rhizoma	623
White peony root	Costusroot	615
Radix glycyrrhizae	Coptidis rhizoma	576
Angelica sinensis	Coptidis rhizoma	552
Coptidis rhizoma	Scutellaria baicalensis	550
White peony root	Angelica sinensis	529
White peony root	Radix glycyrrhizae	525
Radix glycyrrhizae	Costusroot	519
White peony root	Scutellaria baicalensis	515
Angelica sinensis	Costusroot	506
Scutellaria baicalensis	Costusroot	498
Radix glycyrrhizae	Scutellaria baicalensis	491
Coptidis rhizoma	Coix seed	473
Angelica sinensis	Scutellaria baicalensis	463
Costusroot	Coix seed	452
White peony root	Coix seed	445
Angelica sinensis	Radix glycyrrhizae	441
Atractylodes macrocephala koidz	Coptidis rhizoma	382
Atractylodes macrocephala koidz	Costusroot	366

**Appendix 3: Table 3 Analysis on Frequency of Five Drugs for Different Patterns of Syndrome of Traditional Chinese Medicine for UC**

Pattern of syndrome	Frequency of sour drug	Frequency of bitter drug	Frequency of sweetish drug	Frequency of pungent drug	Frequency of salty drug	Frequency of light drug
Incoordination between the liver and the spleen	94	198	334	108	0	86
Intertwist of cold with heat	95	145	288	122	12	52
Spleen-kidney yang deficiency	121	152	161	146	11	102
Spleen-stomach deficiency	82	206	140	159	63	156
Qi stagnation and blood stasis syndrome	86	162	117	163	23	2
Total	478	863	1040	698	109	398

# Racism in a Place of Healthcare: The Qualitative Case of a Rural Australian Hospital

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**Abstract:** This article explores how racism manifests in a rural place of healthcare from the perspectives of patients - both a patient's experience of racial vilification and patients' racially prejudicial views towards healthcare providers. This article analyses two interview data sets. Contrasting themes of feeling 'unwelcome and unsafe' in the hospital and expressions of being 'privileged and strong' were identified. These themes illustrate the profound effects of racism on access and the maintenance of culturally unsafe environments for hospital patients, specifically those identifying as First Nation Australian, and emphasise the critical importance of cultural diversity within the rural health workforce. The analysis demonstrates how racism impacts upon and affects two central functions-accessibility and acceptance-in the provision of healthcare in rural places. It is suggested that a range of health actors, including policy makers, health service managers and translational researchers, need to converge on and engage with how racism manifests in contemporary rural healthcare settings to address issues of 'race' and racism in contemporary places of rural healthcare from multiple, intersecting subject positions.

**Keywords:** Racism, racial prejudice, rural hospital, Australia, health disparities, patient experience, rural health

## 1. Introduction

Racism has a substantial impact on healthcare provision and health outcomes in multicultural societies [1-5]. Racial prejudice remains a serious access barrier to mainstream health services for many people [6-14]. Racially prejudicial views marginalise and exclude health professionals who occupy racially marginalised identities in the health workforce [15-18]. The emotional, mental, and physical costs of racism are recognised within current health research [5,6,16,19-21].

Place-context informs the particular manifestations, experiences, and consequences of racism in formal healthcare settings [10,22]. In rural Australian places, racism is embedded within health institutions [23], reinforcing racial discrimination and White privilege [22]. Rural context and associated service access complexities [23] mean that residents have few service choices [24,25], most especially secondary services [26]. Further, rural places have a limited pool of health professionals to draw on to staff services [27-30].

In this paper, two contrasting interviews that exemplify how racism manifests in a rural place of healthcare from the perspectives of patients are analysed: a patient's experience of racial vilification and patients' racially prejudicial views towards healthcare providers.

These findings are then contextualised within broader social discourses and race politics that sustain racism. We illuminate both the important implications of racism for experiences of health and

healthcare in rural Australian places and the development of healthcare in rural places.

We argue that critical interrogation of enduring racial tensions within rural Australian places is required to improve the quality of rural healthcare. This is relevant both for access to care and the acceptance of health professionals from a variety of socio-cultural backgrounds into the rural health workforce.

## 2. Literature Review: Racism in Contemporary Health Services

Racism is grounded in historical ideologies that categorise people into racialized identities that are assigned different, differentiated statuses within a given society [1,5,20,31]. It involves the mistreatment, intentionally, unintentionally, consciously, or unconsciously, of people assigned to racialized identities that are constructed as inferior or marginalised in relation to others [1,5,20]. Different types of racism or discriminatory treatment based on the fallacy of 'race' as a biological category [1] have been conceptualised in contemporary literature. For example, 'everyday racism' has been described as 'systemic, recurrent, familiar practices' where 'socialised racist notions are integrated into everyday practices and thereby actualise and reinforce underlying racist and ethnic relations. Today, 'overt' racism, otherwise known as blatant or old forms of racism, co-exist with subtler, 'covert', or modern/new forms of racism that are normalised, especially in relation to First Nation Peoples [1-5, 8]. Racism, in its varied, complex, and overlapping forms, is manifest

across all levels of society, from routine institutional practices to interpersonal, everyday interactions [2-5,20,32].

Consequently, despite protestations [4,33-36], there is a considerable body of evidence documenting patient encounters with systemic, institutionalised racism within contemporary health services [6-8,19,37,38]. Experiences of racism in healthcare settings among First Peoples is an international phenomenon [20,39-43]. Several studies have investigated First Nation Australians' experiences of racism in mainstream health services [2,3,5,9,42,44-48]. This research is consistent in positioning racism as a key determinant of health and underlying explanation for persistent health disparities [5,9,19,20,37,38,45,47,49-51].

The relationships between racism and (poor) health experiences and outcomes are many, intersecting, and multileveled. For instance, on a structural level, Harris et al. [20] have argued racial prejudice plays a role in determining how societal resources and other health determinants, including education, employment, and housing, are structured and organised. On a relational level, experiences of racial discrimination in the healthcare sector can lead to avoidance or delay in seeking healthcare for health-related concerns and/or conditions [3,9,20,38,40,49] and the cultivation of a lack of trust in health professionals and services [9,19,7,52]. It has been demonstrated that when patient trust is low, the advice given to patients by health professionals is less likely to be followed [19,37].

On an individual level, there are serious long-term consequences of repeated experiences of racial discrimination on people's physiological and psychological wellbeing. For example, the physiologic responses triggered by stressful experiences like racial discrimination can contribute to chronically elevated blood pressure [5,6,19,20,47]. Racial discrimination has been identified as a risk factor for the development of ischaemic heart disease [6] and has been found to negatively impact mental health and health-related practices (e.g., rates of smoking and the consumption of alcohol) [19,20,38,45,53]. However, despite this growing body of evidence, political attention remains on the individual and individual health practices rather than on relational and structural dynamics, including experiences of racism and substandard healthcare, that inform an individual's health practices and status [6].

Research documenting health professionals' experiences of racial discrimination in health service settings is sparse [54], particularly in relation to racial prejudice directed towards medical doctors from patients and/or patients' families [55,56]. In the context of exploring the experiences of internationally trained nurses in English hospitals, Alexis [15] found 'race' and racial prejudice were central to themes of marginalisation and exclusion in the workplace. Relatedly, Cottingham, Johnson, and Erickson's [16] study examining the roles of race and gender in the emotional practices of hospital-based nurses in the United States found that encounters with racism from colleagues and patients were common. In managing these experiences, Cottingham et al. [16, p. 145] found that nurses of colour perform an 'emotional double shift' to 'remain and succeed in white

institutions' that depletes emotional resources and, in turn, compromises the quality of the healthcare that can be provided to patients. Other research from the United States has also highlighted how nurses' experiences of racial discrimination in the workplace can negatively affect retention [57].

In the field of medicine, it has been argued that the class and occupational status afforded to practitioners can 'shield' doctors from racial vilification [58]. However, Murti [59] found that Indian doctors who had immigrated to the United States were only afforded 'partial, situational protection' from racism by their status as medical doctors and still encountered racism from their White medical colleagues. This is consistent with research from the United Kingdom that highlights the historical prejudice, discrimination and stigma experienced by overseas-trained doctors and doctors occupying racially marginalised identities [17,18]. In a rare example of research focused on doctors' encounters of racism from patients and/or patients' families in Israel, Popper-Giveon and Keshet [54] examined refusal of treatment based on the ethnicity of the practitioner. Their results indicate incidences of ethnic-based treatment refusals weigh heavily on practitioners, but 'the ethos of neutrality in medicine... masks and silences various incidents of racism directed against healthcare professionals from various ethnic and racial minority groups' [54]. For Popper-Giveon and Keshet [54], treatment refusals based on the ethnicity of the practitioner reveal a yet unresolved tension between two central values underpinning contemporary approaches to the delivery of health care - apolitical medical neutrality and patient-centred care.

### 3. Methodology

#### 3.1 Research setting and data source

The research project for which the data reported on here was collected aimed to investigate the experiences of rurally based residents living with chronic obstructive pulmonary disease (COPD), which is currently the third most prevalent cause of death globally. Cigarette smoking is recognised as the most common risk factor for its development [60]. COPD is a long-term, irreversible condition that reduces people's lung function, damages other internal organs and inevitably depletes the ability to manage everyday life [61]. Breathlessness and suffocation have been identified as common fears for those with COPD [61].

As part of this project, 14 semi-structured interviews were undertaken with a convenience sample of residents living in north-east Victoria, Australia who had a diagnosis of COPD and were admitted to a rurally located hospital in the preceding 12 months [62]. Signed consent was obtained from each participant in the study prior to the commencement of an interview [63] and each interview was audio recorded and transcribed verbatim. The majority of participants identified as Australian citizens with Anglo-Saxon heritage; some spoke about having been born in Australia and living in rural communities for much of their lives. One participant whose experiences are detailed in this paper identified as First Nation

Australian. Ethical clearances were approved by both The University of Melbourne and the clinical institution assisting researchers with recruitment (please note that to protect confidentiality/anonymity the authors are unable to include the name of the health service).

During the preliminary stages of analysis, in which data were coded line-by-line [64], researchers observed sections of data in two interviews wherein participants were describing experiences of racism from or articulating racist discourses towards healthcare providers in the hospital [65,66]. These accounts were identified as important by the researchers [67]. Considering these data worthy of further analysis, an additional researcher with an interest in cultural processes in the field of rural health was approached to join the research team [68] and ethics approval to conduct analysis focused on racism was requested and granted. The objective of this analysis was to concentrate on what the data across two contrasting interviews – one involving a patient who had experienced racial discrimination in quite overt forms, and one involving a patient (and the patient's partner) who directed racially prejudiced views towards a healthcare provider in quite covert ways – contributes to current debates and knowledge about the phenomena of racism in contemporary rural places of healthcare and the need to engage with its manifestation in healthcare development for rural places.

### 3.2 The two contrasting interviews

In their exploration of data saturation as a concept in qualitative research, O'Reilly and Parker [67] return to the foundational purpose of research: 'to extend and advance knowledge'. They draw critical attention to how different epistemological assumptions underpin different forms of qualitative research, which is ignored by dominant contemporary mechanisms for assessing 'quality' in qualitative research. Braun and Clarke [69] develop this argument. They illustrate how neo-positivist assessments of quality in qualitative research are becoming accepted as the 'gold standard' against which all qualitative inquiry, regardless of appropriateness to the research undertaken, is assessed by knowledge gatekeepers; a trend that impacts upon the kinds of qualitative analyses that are published, and thus heard by wider audiences [69]. However, some well-regarded journals in the social sciences maintain a respect for alternative qualitative traditions and resist these trends.

In focusing on two interviews in this paper, we hold, along with other qualitative researchers who have published similar analyses (see for example, [70] in the *Journal of Rural Studies* that analyses a single interview transcript), that there is merit and value in giving primacy to the voice, knowledge and experience of a few, not because they are necessarily representative of other individuals (although this may be the case), but because our purpose as qualitative researchers is to explore perspectives and each individual's life is unique, rich, complex; and worthy of exploration [67,71]. Voices like 'Violet's', the First Nation Australian participant in this research, are seldom heard in the Australian context [72] we have an ethical responsibility to circulate the findings presented in this paper [70].

The stories and perspectives shared in the two interviews are important for collective knowledge about how racism works in rural hospital settings. They are rich in information, complex in nature, and demonstrate how intersecting social and political structures and processes sustain racism. Thus, these accounts are adequate to achieve the aim of the analysis [67,69,73,74]. We offer an extension and advancement of current understanding about how racism operates in and effects health care for those who are underserved in rural communities and call for future inquiries to extend and build on this work [67,75,76].

### 3.3 Data analysis and interpretation

The first author read and re-read the interview transcripts to become familiar with the data and make some initial observations about the potential meanings that could be interpreted [64,65,77]. Each transcript was then selectively coded by this author for 'instances' of racism and/or instances pertaining to the phenomena of racism [65]. These codes were reviewed, developed and refined by repeatedly examining each identified section of data until the central idea interpreted from that section of data was able to be clearly articulated and all instances across the data were collated [65,78]. The resulting codes were then examined for potential relationships to one another [64,65,79,80].

During this process, Braun and Clarke's [65] advice to focus on identifying a 'central organising concept' that links different codes together was taken to ensure that the proposed themes clearly articulated what was meaningful about the data in relation to the aims of the analysis [77]. The resulting themes were reviewed by all authors by returning to both the coded and un-coded data to cross-check whether the codes and the grouping of codes into themes made sense and were faithful to the data [64,65,80] from the perspectives of all authors [81,82].

Discrepancies and points for clarification were raised and discussed among the authors and group decisions were made about how to reconcile and clarify the analysis [83].

In the preceding section, a short description of participants' context and particular circumstances, synthesised from details supplied in the interviews, is provided prior to the specific findings related to racism. This has been done to situate the analysis and ensure that readers have sufficient information to connect and orientate to, and gain an insight into, the worlds of the participants around whose interview data the analysis is focused [75,84]. Direct speech is quoted to demonstrate *fit* between the analysis and the data [75,85,86].

## 4. Results

### 4.1 Violet

Violet is a First Nation Australian woman in her early 50s. She describes herself as suffering from 'quite a few illnesses', including COPD, since her mid-40s. Violet has lived in rural communities since her diagnosis of COPD, which has led to frequent emergency hospital admissions; sometimes, multiple admissions in the same week. From

her own description, Violet is socially isolated, but has one adolescent child who she describes as her major source of support and motivation.

#### 4.2 Violet's story: Unwelcome and unsafe

Violet's experiences with healthcare providers evidenced the enduring dominance of racist discourses and stereotypes within the hospital, which were articulated in quite blatant and explicit ways. For example, Violet described feeling 'scared to go to the [local rural] hospital' because of how she was perceived by staff. This feeling was based on her previous experiences of being admitted to the hospital. Violet explained that she had heard staff saying, 'here comes [Violet] again', which had made her feel uncomfortable going to the hospital, like she was a 'burden' to staff: '...I just don't feel comfortable, because I feel like I'm being a burden to them every time I go in there...' Other research has found those with COPD can feel like burdens to healthcare providers because of how the disease forces them to seek help and thus demeans [61].

However, for Violet, feeling like a burden was 'all tied up together' with her identity as a First Nation Australian and the popular stereotype that First Nation Australians go to hospitals to 'get drugs'. Goodman et al. [87] argue that this racially prejudiced stereotype of First Nations peoples has a profound impact on the quality and safety of clinical and broader healthcare practice, and this is borne out in Violet's experience. For example, one encounter Violet described involved a nurse who used a highly derogatory and offensive term in the Australian context, 'Abo', and drew on racially prejudiced stereotypes of First Nation Australians to justify their disregard and mistreatment:

I said to the nurse, is it all right if I go to the toilet? She goes, yeah, I cannot stop you...Then she turns around and says, lunch is coming, do you want a hot meal or would you like a sandwich? I said, well, I don't eat bread, can I have a hot meal. She goes, okay. I get back and there is a sandwich there, and I said, but I told you, I don't eat bread. She goes, you should be grateful you get anything...you Abos are all the same. You just come here to get food and get drugs...

Experiences like these led Violet to understand that disclosing her identity in this place of healthcare can lead to serious mistreatment. For this reason, she described being 'too scared to tell them [hospital staff, that she identifies as First Nation Australian] because of the way that they'd treat it' and 'too embarrassed to tell anyone' beyond 'a couple of people' who she trusts in the local hospital. Violet described herself as 'proud' of her identity, but 'I just don't want to get treated different...'. From past experiences, identifying more openly in the service had led Violet to receive 'different' treatment. 'Different' in this context meant substandard care rather than an appropriate adaptation of care to best meet the cultural needs of the patient [88].

Violet's experiences of racial abuse and discrimination in the hospital – a place people are often in during times of high stress and uncertainty – had led her to be unable to express her very identity. Being essentially closeted in this fashion has serious implications for health and access to healthcare [89,90].

Following the incident described above, Violet left the hospital and refused to be readmitted, despite being considerably unwell. Experiences of racial discrimination, which were described as connected to other perceptions, for example, being frequently admitted to emergency and feeling like a 'burden', had also led Violet to delay seeking healthcare [also see 87].

Violet described how 'There's a few times where I've been here where I've held off and held off...'. It was only at the insistence of her adolescent child that Violet eventually sought care. The experience of shortness of breath and other COPD symptoms is often frightening and debilitating [61]. Violet's decision to delay care whilst in this state is an indication of how intense her feelings of unsafety were, and the powerful impact racial discrimination has on access to healthcare in rural places where service options are limited.

Violet's experiences of racial discrimination, related feelings of being a 'burden' and stereotypes that First Nation Australians are always 'after something' had also made Violet feel uncomfortable asking hospital staff to help her in organising assistance with showering at home. Violet described waiting for a particular (trusted) staff member to ask. This staff member 'asked me why I didn't ask the other nurses...and I said no, it's – I didn't want them to think she's after something else this time. What does she want now?' Goodman and colleagues [50], in their work on the relationship between racism and forms of social support and relationships for Indigenous youth, describe the important role service providers can play in offering social support for those with few other options. For Violet, who was socially isolated with a limited in-place support structure, hospital staff represented an important potential source of support; one that was closed-off to her through the operation of racially discriminatory ideas.

Violet's experiences reflected another important effect of racial discrimination in hospital: the impact of these experiences on mental as well as physical health. For Violet, the impact of COPD on mental health was complicated by the racially discriminatory treatment she received whilst needing to seek care. She relayed how, in the case of the interaction with the nurse described above, she could feel herself 'getting weaker and weaker...to the point where I'll work myself that much that I can't – that I'll just collapse'.

Violet's compromised mental wellbeing, compounded by repeated incidences of racial discrimination and vilification [20], demonstrates yet another dimension and implication of racism within this place of healthcare. Considering Violet's experiences in this place, which reinforce exclusion and discrimination, the 'weakening' she articulates is an understandable though distressing response to the environment.

Violet explained how having healthcare providers, particularly clinicians, who also identify as First Nation Australian can help First Nation Australian patients feel safe in ways not always easily understood in the mainstream health sector [91,92]. Having providers with diverse identities helps to make the service more accessible. Violet expressed that working with health professionals who also

identify as First Nation Australian is different because: 'You feel like you're on their level. You are not being judged, because a lot of people think Abos are junkies, petrol sniffing, bums and – do you know what I mean? Shit like that...' whereas 'the way they [health professionals who identify as First Nation Australian] approach people and talk to people and don't make assumptions. Violet expressed that staff who identified as First Nation Australian were needed in the local hospital. However, as she explained, the importance and value of having workers who identify as First Nation Australian for access is not always recognised in rural health services. Violet described asking at the local hospital '...have you got any Aboriginal workers here? I want to speak to someone that is Aboriginal. No, we do not [when in fact they did] ...They said no, we don't. Any complaints, ring the ombudsman.'

This response demonstrates a lack of understanding, and even a lack of interest in investigating why the presence of workers who identify as First Nation Australian is so important to First Nation Australian patients. It also evidences an important disconnect between what organisations purport to be doing and prioritising in official discourse and the discourses that actually guide everyday action and practice [also see 93] in rural places of healthcare.

#### 4.3 Norm and Jill

Norm is an elderly, long-time, White resident in a small rural community. Prior to retirement, Norm ran a local business and was heavily involved in mainstream community service groups. Despite initially downplaying his health concerns, Norm suffers from a few serious chronic conditions and has done so for many years. He has experienced several major health 'events' and undergone a number of surgeries, some of them serious. Norm participated in the interview with his wife Jill, whom he heavily relies upon for physical, social, and emotional support. Jill is a strong advocate for Norm's health. Both Norm and Jill have high expectations for the quality of healthcare received by Norm.

#### 4.4 Norm and Jill's story: Privileged and strong

Norm and Jill's experiences within the hospital evidenced a clear expectation and ability to demand the provision of quality healthcare on their terms. Their racial and other privileges enabled this expectation and underpinned their response to healthcare providers who occupied racially marginalised identities. The only person Norm and Jill described as 'unhelpful' in their many years of intense contact with the local hospital was a female 'Asian' doctor who was assigned to Norm upon entry into the local emergency department following a collapse. This doctor was described as a 'little Asian bird' with an 'abrasive' demeanour.

Norm and Jill explained that when they returned to the emergency department later that same day because they could not get in to see their usual primary health care physician, '[Jill speaking] she [the female "Asian" doctor] was still there, so she was quite rude to me'. It was then implied that this doctor lied to Norm and Jill about the availability of other doctors, senior local physicians of White

descent, who were well known to them (and well known in the town generally) working at the hospital.

When asked whether this doctor (the 'Asian') had checked Norm's medical history, Jill responded, 'When we first went in in the morning, she did'. Norm explained, however, that 'She [the female "Asian" doctor] didn't have the skills. She was Asian...', to which Jill interjected, 'we're not racist', but this doctor was 'aggressive'. When explaining the nature of this aggression, Jill described how this doctor told Norm he was 'grossly overweight' though, according to Jill, 'he wasn't as big as what he is now' and told him to 'go home and lose three stone'. This was 'instead of telling me [Norm] my heart's not working...She was only an intern or something. By now she's probably a professor'. This dialogue implied that the doctor's racialized identity, as 'Asian', meant that she 'didn't have the skills' to care adequately for Norm. The quick denial and deflection away from this statement suggests that there was an awareness of how such claims could lead to accusations of racism. It illustrates the process van Dijk [36] described in their account of how denying racism structures race talk in ways that allow the Other to be portrayed negatively and the speaker/s' self-presentation to be protected.

Describing this doctor as a 'little Asian bird [emphasis added]', a term often used to infantilise and dismiss women [94], served to further undermine this doctor's credibility. Consider the specific reference to her size, 'little', in relation to the recommendation for Norm to lose weight. Neither Norm nor Jill acknowledged the relevance of overweight, possibly obesity, to cardiovascular and other important dimensions of health. However, it is likely that other doctors have discussed with Norm the need to lose weight, especially given his health issues, on several occasions both prior to and since the specific event described here. Instead, identifying this doctor as 'little' works to both undermine her substance and account for the perception of Norm as exceptionally large from her standpoint.

The descriptors of 'aggressive', 'rude' and 'abrasive' used by Norm and Jill are commonly assigned to female-identified subjects in positions of influence stereotypically occupied by male-identified subjects and used to discipline them by re-asserting the dominance of orthodox constructions of femininity [95,96]. The statement that this doctor was an intern and is now 'probably a professor' implies that simply by virtue of being an 'Asian' and female-identified doctor, promotion has 'probably' been inevitable, rather than based on skill or experience attained. There was no concession given for this doctor being an intern at the time of this event.

Despite describing this encounter as a 'bad experience', Norm and Jill expressed that they felt comfortable returning to the hospital to seek care. Jill explained: I will stand up and get it. I wasn't leaving the hospital...I knew he was crook. I knew there was something wrong. It wasn't his three stone. Like he would have been dead if we had to wait for him to lose three stone.

According to Norm, Jill is 'in her element' when she is 'speaking up' for his healthcare: 'you [Jill] become aggressive' and '...you've [Jill] made mistakes from time to time...I've never been as sick as

you've said'. Here, neither Norm nor Jill have been perturbed by their only reported 'unhelpful' encounter in this place of healthcare; both are confident they can receive quality healthcare in the local hospital and in their abilities to extract it. This was emphasised by Norm and Jill both referring to several consultants providing care in the region (who are also all White) by their first names, which suggested a level of familiarity and intimacy with these healthcare providers. Unlike the 'Asian' doctor, Norm and Jill occupy a racially privileged identity in Australia and several other socio-cultural privileges in addition to their Whiteness [97,98]. In this context, Norm describes Jill as 'aggressive', which is embraced, yet when it was assigned to the 'Asian', female-identified doctor, it was constructed as a negative trait. It is also suggested by Norm that he was never as sick as has been implied; thus, it could have been reasonable that upon first presentation, further action was not taken by the 'Asian' doctor. It is also possible that, given this statement – he was never that sick – Norm was directed to a metropolitan hospital not because of the seriousness of his condition, missed by the 'Asian' doctor, but because of the particular race and class privileges he occupies [99], and the strong, aggressive advocate he has in Jill.

### 5. Discussion

Encountering racism as a patient negatively affects access to health services over a long-term period [100]. In rural Australia, there is often only one hospital servicing a relatively large geographic region [26], making service choices limited. Feeling unsafe in places where healthcare is provided and avoiding seeking care as a result, particularly as a patient with a chronic illness, is likely to compromise ongoing health and wellbeing for rural residents [20]. The effects of experiencing racism and engaging in avoidance-type practices on a person's mental, emotional, and social wellbeing, as well as physical health, are not insubstantial [3,20,101].

Ensuring that community diversity is represented within the staff body of health services, and relatedly in health professions, has long been identified by those who are racially marginalised, most particularly First Nation Peoples, as an important means by which health services can work towards improving their safety and accessibility [21,91,92,102]. However, despite official discourses supporting the aim to address a lack of workforce diversity in the health sector, there has been little improvement in stimulating such representation, especially in rural healthcare [103,104]. Consequently, when health professionals who occupy racially marginalised identities are encountered, particularly by White patients, there can be tension and uncertainty [16]. These responses can be accentuated in the case of medical doctors (who are, traditionally, important carriers of authority and influence in many cultures) [105] who occupy racial identities other than White.

Hospital patients and staff are part of wider communities and embedded within and influenced by dominant racist discourses and prejudicial views [106]. As the research of Popper-Giveon and Keshet [54] highlights, this socio-cultural context cannot be left at the hospital

entrance; it plays out within places of healthcare [107]. It is possible that, for patients positioned within a racially privileged category (Whiteness), perceptions of inferior healthcare can arise when healthcare providers are viewed as non-White. However, as the analysis here articulates, such experiences for White patients do not necessarily affect long-term access to health services; they continue to expect, and feel able to demand, high quality healthcare from their local hospital and are unlikely to experience such services as unsafe, or to avoid seeking care. In this research, Norm and Jill persisted until their needs were met, and did not position themselves as a 'burden'. This contrasted with Violet, who was highly conscious of being perceived as a burden and had been deemed unworthy even to receive a hot meal by local hospital staff. Walter [108], in their analysis of nationalism and new racism in Australia, argues that notions of equality have been influenced and redefined by race politics so that 'what were previously defined as efforts (albeit inadequate) to ameliorate the gulf of inequality and exclusion of Indigenous Australia from participation in Australian society are now deemed preferential treatment and therefore decried as unfair and unacceptable'. Violet's experience powerfully illustrates this re-framing of equality, and with it the rebuilding of barriers to basic rights [108] like access to safe, quality healthcare in rural places.

This analysis adds to literature on cultural safety, specifically for First Nation Australians, and extends current scholarship centred on racial tensions within rural Australian health services. It provides a critical account of patients' experiences and use of racist discourses in a rural Australian hospital. Thus, it contributes to current understandings of an important dimension to contemporary health care issues for underserved population groups: enduring racial prejudice in rural places. The analysis illuminates the importance of engaging with racism and racial tensions in the development of accessible healthcare in rural places.

Further research is needed in the local place to explore how endemic these findings may be, but also, given the prevalence of racism generally, nationally and internationally, to build a substantive evidence-base for future action [67,109]. Targeted studies exploring racism, including implicit and subtle forms, from multiple positions, in contemporary healthcare contexts are needed to develop substantive explanatory models for its mechanisms [84,86]. Moreover, while rural and urban-based health services are situated in different kinds of place contexts and thus, manifestations and effects of racism may differ, racism remains a substantial issue to be addressed across all healthcare settings. Thus, future research is needed in and across different place contexts.

### 6. Conclusion

A range of health actors, including policy makers, health service managers and translational researchers, need to converge on and engage with how racism manifests in contemporary rural health care settings. Racism impacts upon and affects two central functions – accessibility and acceptance – in the provision of healthcare in rural

places. Accessibility, and thereby the effectiveness, of services in providing care to residents who occupy racially marginalised identities is critical for the development of healthcare in rural places. The ability of health professionals who occupy racially marginalised identities to be accepted as providers of care by White community members is similarly critical because health professionals with diverse identities play an important role in building a rural health workforce and increasing the cultural safety of rural health services [91, 110]. By interrogating two contrasting instances of how racism manifests, this paper highlights the need for greater critical engagement with issues of 'race' and racism in contemporary places of rural healthcare from multiple, intersecting subject positions.

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# Developing Cross-Cultural Communicative Competence among Chinese University Students: A Survey Study

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**Abstract:** The guiding document *University English Teaching* states that “telling the China story well” is an important goal of teaching English in Chinese universities, which stresses the development of students’ cross-cultural communicative competence. This paper reports on a survey study that investigated the current state of Chinese university students’ cross-cultural communicative competence. The survey results suggest that, as part of a national strategy, greater emphasis should be given to cross-cultural communication within the English teaching curriculum at Chinese universities, and that we need to improve both our textbook materials and our methods for teaching cross-cultural communicative competence. The paper also discusses how to improve their cross-cultural communicative competence to “telling the China story well” among Chinese university students in terms of “what to say” and “how to say”.

**Keywords:** Cross-cultural communicative competence, communication in the audience’s mother tongue, telling the China story well, discourse logic, survey study

## 1. Research Background

Today, more than ever in the last 40 years since its reform and opening up, China is experiencing profound social changes. Since the 1990s, as China has emerged as a major world power, the “China threat theory” has spread within the global community. In particular, with the outbreak of the COVID-19 epidemic, China has found itself both misunderstood and bitterly attacked in Western propaganda about the origin of the virus and our supposedly inadequate safety precautions. As a result of such attacks, China is faced with a difficult and urgent task to better “explain a misunderstood China to the world”, and to “tell the China story well” (Yang, 2020). In this paper, the phrase “to tell the China story well” means to show the world the real China, not China as it is often portrayed by the biased western media, and to give voice to authentic Chinese opinions. At the domestic level, a comprehensive revival of Chinese traditional culture has become a major national strategy (GOCPC & GOSC, 2017). The Chinese government has implemented a series of policies, which propose to “cultivate a large number of talented students with international vision, understanding international rules, and capable of participating in international affairs and competition.” (GOCPC & GOSC, 2017). In November 2020, the Chinese Ministry of Education issued the “Declaration on the Development of New Humanities Education”. This document proposed an acceleration in changes within the education system that would foster a new generation of young, self-confident Chinese people, with a sense of both national pride and personal independence, and cultivate them to become inheritors of Chinese culture, and communicators of “the China story”. In the light

of these policies and publications, and of the great social changes that have taken place in recent years, it is directed that English departments at Chinese universities should move away from traditional classes that simply improve language ability, and focus more on teaching cross-cultural communicative competence so that in the future they can provide a large number of well-trained young people capable of supporting China’s international business needs, and of representing their country accurately upon the world stage.

## 2. Issues in the Cultivation of Cross-Cultural Communicative Competence

This shift from language skills instruction to teaching cross-cultural communicative competence is the responsibility of university English departments. It has become necessary because China has often been misrepresented in the foreign media, and because of the directive from the Ministry of Education about training young people to accurately communicate China’s point of view.

The key element in “telling the China story well” is communication in the target language. Target language communication refers to “cross-cultural communication in the language used by the recipient or audience”, that is, in English (Guan & Li, 2011, p.1). Communication from the Chinese point of view involves the conversion of Chinese into standard, natural English. But this language conversion is only superficial; “cultural information transfer” is more profound. “Language and culture are not completely identical, and the literal translation of language does not necessarily lead to the complete transfer of cultural information”. This is because “the encoding (input meaning) and decoding (output meaning) of

language symbols are carried out through ‘cultural filtering’” (Guan & Li, 2011, p.7). Stuart Hall, the Jamaican-British cultural theorist, interprets “culture” as “the shared meaning of a society or group” or “shared conceptual maps”. Hall believes that “Each of us probably understands and interprets the world in a unique and individual way. However, we are able to communicate because we share broadly the same conceptual maps and thus make sense of or interpret the world in roughly similar ways” (Hall, 2003, p.18). In other words, in language communication in the target language, the meaning of the words is rooted in the audience’s cultural map. The map of culture or shared ideas is the deepest social convention governing international communication. If we want to achieve true cross-cultural communication and successfully get across our Chinese point of view, then language teaching at Chinese universities will have to be transform language teaching into cross-cultural communication teaching.

Some scholars believe that communication in the target language is “a special form of cross-cultural communication”, with particular characteristics reflected in the “two-step coding” within the communication process. Its basic operation is shown in Figure 1 (see Appendix 1) (Guan & Li, 2011, p13). When we communicate our understanding of China to foreigners, the coding in this process should include two elements. The first element is to choose the content to communicate. This is the process of cutting and refining the China story, according to both the disseminator’s communicative intention and the audience’s cultural expectations including any topics or expressions that they might find unacceptable. This solves the first problem of “what to say”. The second element is to express the particular China story according to a “shared conceptual map” and the audience’s discourse logic (encoding and decoding model, etc.), transforming it so that the audience in English-speaking countries can easily understand it.

This solves the second problem of “how to say it”. This special cultural leap requires the communicator to have profound knowledge and understanding of Chinese culture so that the content of the communication and the meaning to be expressed are clear in the communicator’s mind. The communicator must also be familiar with the patterns of narrative logic and discourse logic that commonly occur within the cultures of English-speaking countries. When the Chinese communicator faces an audience of English-speaking countries, the cross-cultural communicative competence to “tell the China story well” does not refer to the linguistic ability and interpersonal communicative competence which has traditionally been the focus of cross-cultural communication. It refers to a mastery of the discourse, which is achieved by integrating the original Chinese meaning with the foreign audience’s native patterns of expression.

The guiding document *University English Teaching* (2020 ) states that “telling the China story well” is an important goal of teaching English in Chinese universities, and that it emphasizes the human characteristics of English teaching, as opposed to its instrumental characteristics (Xiang, 2020). It highlights the human

history, culture, and understanding between different countries and peoples. But the reality is that many Chinese university students, even though they have studied English for many years, cannot tell the China story well. The basic reason is not simply a problem of language proficiency. It is because most university students do not fully understand the China story themselves, and also because they are not very proficient in cross-cultural communication. They need to familiarize themselves with the characteristics of their national cultural traditions and their society, and the way that ordinary people live their lives, but they also require a deeper understanding of their audience’s language and culture, and its discourse rules of cross-cultural communication. As far as serving the national strategy is concerned, at present, the teaching of English at Chinese universities faces a serious problem, in that the current methods will not move us towards these desired goals.

We need a new approach to the way that English is taught in Chinese universities. We should move away from the traditional goal of merely improving students’ linguistic competence and towards teaching cultural communication, focusing both on interpersonal communication and on the overall national strategy. This paper, therefore, proposes two research questions:

- (1) What is the current state of Chinese university students’ cross-cultural communicative competence?
- (2) How can we improve this cross-cultural communicative competence?

### 3. Research Methods: A Survey Study

A survey study using an online questionnaire was chosen as the research method to address the two research questions. The first set of questions attempted to establish the current state of Chinese university students’ cross-cultural communicative competence (their understanding of traditional Chinese culture and contemporary Chinese values, and their ability to effectively communicate these). The second set of questions aimed to explore current English teaching methods in Chinese universities and to find out how successful these are in raising the students’ levels of cross-cultural communicative competence. The focus of each section of the questionnaire is shown in Figure 2 (See Appendix 2).

The survey was conducted online from November 2019 to March 2020, and the questionnaire was distributed to students from four universities specializing in the teaching of foreign languages in China. By March 2020, a total of 379 completed questionnaires had been collected. After removing a few invalid replies, a total of 373 valid questionnaires was obtained. 87% of the respondents were enrolled at universities in Beijing; the remaining 13% at universities outside the capital. 77% of the respondents were female; 23% were male. These numbers reflect the fact that there are many more females than male students at China’s foreign language universities.

The questionnaire data were imported to SPSS software to test its reliability and validity. The Cronbach’s coefficient (Cronbach’s  $\alpha$ ) of the questionnaire was found to be 0.82, showing that the

questionnaire was reliable and effective. After factor analysis, the KMO value of the questionnaire was 0.71, showing that the construct validity of the questionnaire was good.

#### 4. Research Findings

##### 4.1 Current State of Chinese University Students' Cross-Cultural Communicative Competence

The results show that Chinese university students' perception of traditional culture and their ability to identify contemporary Chinese values were as follows: in more detailed terms, the university students' recognition of the spirit of traditional Chinese culture (4.4) was higher than their understanding of concrete traditional cultural symbols (2.9). Their understanding of traditional cultural symbols such as traditional Chinese medicine, Chinese martial arts, and traditional drama was relatively low (2.6, 2.6, and 2.4). The students identified closely with the contemporary Chinese values of "freedom", "equality" and "integrity", and very closely with the achievements of contemporary China (4.2).

According to the student responses, the most deficient element in their cross-cultural communicative competence was their foreign language ability (5.7), followed by their international vision and ability of coordination of concepts (4.0), their cross-cultural understanding and expression ability (3.8). The situations that the students encountered most frequently in their real lives in which cross-cultural communication took place were "introducing Chinese scenic spots to foreigners" and "introducing Chinese food to foreigners". It was also noted that 20% of the students reported that they had not conducted any cross-cultural communication activities in English.

The data showed that the students generally identified with Chinese culture and the China story, but they lacked both the English proficiency to communicate with them and the chance to meet foreigners in situations where such cross-cultural interactions could take place. In general, therefore, the students could be said to have low levels of cross-cultural communicative competence.

##### 4.2 The Current State of the English Teaching Curriculum in Chinese Universities

Although the results of the questionnaire showed that school education plays an important role in helping students understand Chinese traditional culture, the vast majority of the subjects believed that the type of English teaching that they had experienced at university could be described as "teacher-centered, students passively accepting". The students reported that they mainly learned about Chinese traditional culture from information given out by the teacher (classroom lectures and homework), through autonomous learning after class or classroom presentations, and through discussion among themselves. The students believed that telling the China story well was the most relevant content of their university English curriculum. However, they identified the most significant problems with the curriculum as "students do not attach enough importance to it", "emphasize theory and ignore practice" and "dull and boring form of teaching". The main problems encountered were the "weak

foundation of English language", "weak foundation of English culture" and "lack of awareness of cross-cultural communication".

Therefore, according to the students themselves, the current university English teaching curriculum does not meet the goal of improving their cross-cultural communicative competence. A dominant input teaching model (teacher-centered), combined with the students' low levels of English, and their low cultural and cross-cultural awareness are the roots of this problem.

#### 5. Discussion and Conclusion

In this section, taking into account the questionnaire results, we discuss ways in which we can improve the teaching of cross-cultural competence in university English departments in China. This issue can be divided into two questions: "what to say" and "how to say it".

##### 5.1 What to Say

As the content of the English teaching (the input) largely determines the content that university students will be able to use in their cross-cultural communication (the output), we need to both reform the curriculum and radically change the sourcing of our teaching materials. As well as choosing relevant materials from British and American sources, we should also include classic works from traditional Chinese culture in the course textbooks. For example, the students could study English versions of *The Analects of Confucius*, *A Dream of Red Mansions* and other masterpieces, such as *My Country and My People* and the series *Chinese Culture and Civilization* co-published by Yale University and New World Press. These sources can be used in university English textbooks and readers, to enable students to acquire the ability to easily discuss Chinese traditional culture in English.

If we want to improve our students' cross-cultural communication ability in terms of "what to say", we should urgently launch a teaching reform program that "cultivates cultural roots." Our mission to "tell the China story well" does not mean simply pandering to the west. It is a practical aim, based on our cultural self-esteem and self-confidence. Our communicators, whether they are teachers or students, should firmly stick to our "Chinese roots". In the idea of Mahatma Gandhi: I hope the wind energy of cultures from all over the world can blow to my homeland, but I can't let it take me away from my roots. Only by understanding and identifying with our own culture can the true essence of Chinese culture be accurately communicated to a foreign audience. An excellent representation of our traditional culture is the spiritual lifeline of the Chinese people and the means of building the Chinese spirit, Chinese values, and Chinese strength. Indeed, the lack of traditional Chinese culture in current university English teaching has aroused widespread concern (Wang, 2012; Yan, 2014). Against the background of globalization, the impact of the dominant Western culture on China, and its influence on Chinese university students' lifestyles, increase the risk that our university students may forget their roots. The lack of native culture in the current university English curriculum may cause these young people to lose the opportunity and the ability to communicate their own

culture. More worryingly, these students who cannot discuss their own culture will often hear about Chinese stories from the foreign English-language media. These stories are told from a Western perspective and are imperceptibly affecting our students' world outlook and value judgments. If they lack a proper grounding in their cultural foundations and have grown accustomed to hearing their own country's heritage being communicated by foreigners, how can our younger generation take on the responsibility of telling the China story well? It is for this reason that Chinese culture should be introduced into the English teaching curriculum at Chinese universities, and why we should launch a teaching reform program of "cultivating cultural roots."

However, such a program will not be enough. For our students to more effectively absorb their traditional Chinese culture, we also need a program of "strengthening roots." This is to heal the fracture between traditional and modern Chinese culture, a problem that besets our cultural heritage. Worldwide audiences would like to understand the story of today's China, China's historical traditions, the spiritual power shaping China and its economic development miracle, Chinese achievements, and also Chinese problems. As the future communicators of the China story, our university students should rely on their own culture. To understand today's China, they should be able to stand at the meeting point of our ancient traditions and the modern world. Indeed, understanding the modern significance of traditional culture is the key to interpreting the China story. Therefore, we need to implant this kind of heritage and this kind of connection in our English teaching curriculums at universities, so that our students can use their experience of modern life to enhance their recognition and their understanding and of our own cultural identity and our cultural traditions. This is the great significance of the proposed "strengthening roots program".

We should change the current rather dull teaching content and instead, create more inspiring and realistic teaching materials. The lively and life-like nature of the materials should be reflected in their modernity. The classes should be positioned as close as possible to the students' real lives. They should be expressed in modern language and should reflect the perspectives, feelings, and problems of today's Chinese university students. The classes should encourage the students to learn how to discuss modern life and to look for connections between the present and the past. For example, concerning the contacting means and reading methods, I have used "the mobile phone" as a starting point. I asked my students to trace the development of human communications right back to traditional stories about "delivering letters by wild geese or by pigeons," and "reading by the light of the fireflies and the reflection of the snow" in ancient China. I interspersed these materials with scenes from modern movies about different means of communication. I directed my students to think more deeply by asking them to express in English how the ancients, who of course did not have mobile phones, spent their time pouring their feelings into the mountains and rivers, and set their hearts free, creating China's pastoral poetry and landscape

painting. My students were extremely interested, as they could experience for themselves a way of integrating our traditional and modern cultures. Innovative ideas of "what to talk about" could also be inspired by the cultural TV program "China in the Ancient Classics" that was recently broadcast on CCTV-1. In this program, ancient and modern scholars were shown reading *Shangshu* together, across a period of nine dynasties. Through this dialogue that unites ancient and modern times, they take the audience to the deepest spiritual world, by exploring the ancient Chinese political philosophy of "people-oriented governance", from which our contemporary "people-centered" theory is derived.

### 5.2 "How to Say It"

To tell China's story well, we need to get to know both ourselves and our audience, while studying how to best achieve a cross-cultural communication discourse. To cultivate this ability, we need to guard against our cultural centralism and blind cultural arrogances. These two pitfalls can often arouse the audience's resistance and even disgust and can hamper effective communication. Since China has more than 5,000 years of civilization and deep culture, it is tempting for Chinese people to use certain expressions to talk about the superiority of their own culture. For example, some Chinese tour guides may give the impression to their foreign guests that they regard their own culture as the most splendid in the world. Foreigners can find this very offensive. Indeed, in some ways, it is very difficult to understand one's own culture unless one first explores other cultures. As Edward Hall said in his book *Silent Language*, "those from whom what a culture can conceal most is the people immersed in it." Hall passionately believes that "all the gains of studying foreign culture are the intermediary of understanding, and the ultimate goal is to have a deeper understanding of how one's own culture works" (1995, p. 28).

If we increase the amount of Western culture in our English teaching materials, including the history of Western civilization, art, and religion, our students' international vision will be expanded, and this will cultivate a healthy cultural consciousness. For example, when Chinese students study the Forbidden City, at the same time they can also go online to explore the Louvre in France, the British Museum in Britain, the Hermitage Museum in Russia, the Metropolitan Museum in the United States, and the Sagrada Familia in Spain. Then they will better understand how to introduce their own Chinese culture, a unique branch in the world's cultural garden, so pleasantly and attractively, while enjoying a show of fascinating cultures from all over the world.

Mastering the audience's encoding logic (the sense behind the way a culture is encoded for communication) is the key to telling the China story well. One of the most convenient and effective ways to master this encoding logic is to learn about it from English documentaries. We should encourage our Chinese students to analyze foreign encoding logic, and train them to change their way of thinking when they wish to explain aspects of Chinese culture to foreigners. The best way to do this is to change the teaching methods and materials in the university English curriculum.

At the linguistic level, the most obvious logical difference between English and Chinese is the structure and organization of the language. English is a hypotactic language (in which conjunctions are used to show the relationship between clauses), whereas Chinese is a paratactic language (clauses are simply placed one after another, with no conjunctions). English reflects the uniqueness of the tradition of analytical thinking in English-speaking countries, which differs greatly from the tradition of comprehensive or holistic thinking in Chinese culture. English teachers should be aware of this as they guide their students to a better understanding of the discourse logic represented by the structure of the language in English sentences.

For example, in teaching the Integrated English Course, I do not explain the text with words and sentences in the traditional way, but instead, encourage students to think for themselves. Take, for example, the first sentence of the article “We Have Been Hit” in our textbook: With the building in flames, one man needed help. Another man refused to leave him.

I ask my students to examine this initial sentence and to analyze and summarize the encoding logic behind the English words and the structure of the sentence. The article describes the moving story of how the staff of the World Trade Center in New York sacrificed their lives to help others during the 9.11 attack in September 2001. I begin by encouraging my students to understand how the form of this sentence expresses its core meaning, based on the language structure. The first prepositional phrase “With the building in flames” can be seen as background information, while “one man needed help” is the main clause, which describes the development of the event. However, a full stop is used, followed by a new sentence. This is done for emphasis because it leaves a space for the reader to think. It also has the effect of isolating and emphasizing the last part “Another man refused to leave him”. This is precisely the core meaning of this sentence, which reflects the theme of the whole article. Then, I show my students the speech that President Bush gave after the 9.11 attack. Bush declared that the great American people had responded to the evil in human nature (the evil acts of the terrorists) with the most beautiful humanity (the sacrifice of the victims). Again, I ask my students to examine the logic of this, to help them gain a deeper understanding of the whole discourse of President Bush’s speech.

On a cultural level, stories told in English reflect the patterns of thinking of English-speaking people. For example, the discourse logic of BBC television documentaries about China often has the following characteristics. Firstly, through a combination of ancient and modern narrative, the makers focus on the contemporary development of China, while exploring the contributing factors and the reasons behind it. Secondly, to break through the barriers of understanding, they use maps to mark the time and space in which an event happens. They may use a cultural map of China to encode their messages. Thirdly, they follow the usual rules of telling exciting stories, so that they engage the emotions of the audience. And lastly, they include footage of the lives of ordinary Chinese people, to give their documentary a universal appeal.

If we make good use of such excellent documentaries in our English teaching, it can have a strong beneficial effect on our students. For example, in an English class, I asked my students to talk about some Chinese gardens and then had them watch the BBC documentary *Chinese Garden*. The students found that the encoding of this documentary was unique. Keeping in mind that a British audience might struggle to understand the complex theories behind the design of Chinese gardens, the producer uses the Suzhou-Huangshan-Beijing-Tokyo linear structure as a way to explain the gardens’ origin and development. The documentary focuses on revealing the meanings behind the symbols in Chinese gardens by telling the audience that the inspiration for Chinese garden design comes from Huangshan, which is also the home of traditional Chinese landscape painting. Both these arts derive from Chinese people contemplating nature. The documentary’s encoding shows the logical transformation from the garden to landscape painting, from private garden to royal garden, and from Chinese garden to Japanese garden. After setting out the Chinese philosophy behind the garden design, in more general terms, it explains the international influence of Chinese culture.

Another example is the BBC documentary *The Story of China*, which begins with the philosophy of ancient China, before going on to explain why China is different from Western nations, in that it is peace-loving, and has no historical cultural gene to invade others or to dominate the world. This is a good example of how we can lead our students to understand the uniqueness of this foreign encoding method so that they can challenge the “China threat theory” in a way that foreigners can understand.

Zhu Xiaoxue, a professor of German at Beijing International Studies University, once took her students to the Forbidden City, where she had them act as volunteers introducing the culture of the Forbidden City to foreign tourists, in German. Explaining Chinese culture to foreigners at such tourist sites helps to enhance the students’ practical experience of cross-cultural communication. This can also be done online, as useful new network technologies such as virtual environments are now readily available.

### 5.3 Conclusion

In conclusion, to encourage young Chinese people to “tell the China story well”, our university English departments should strive to train their students in cross-cultural communicative competence. This training should not be the exclusive territory of courses specifically devoted to cross-cultural communication. Cross-cultural communication should pervade all aspects of English teaching at Chinese universities. Our graduates should be well versed in both Chinese and Western culture. They should have a broad international vision, to reduce misunderstandings and misreading as much as possible. They should be able to master a discourse system, to ensure the China story can be effectively communicated to foreigners. The cultivation of Chinese university students’ cross-cultural communicative competence will be of great importance for many

years to come and is a worthy subject of future research.

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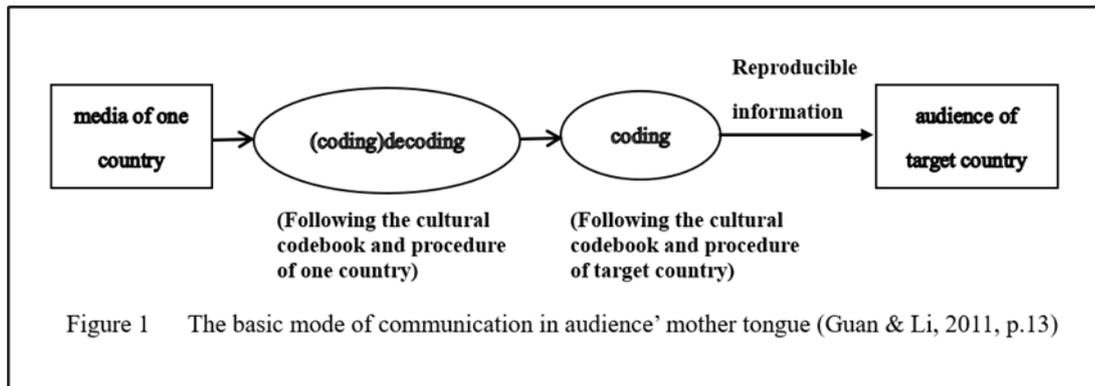
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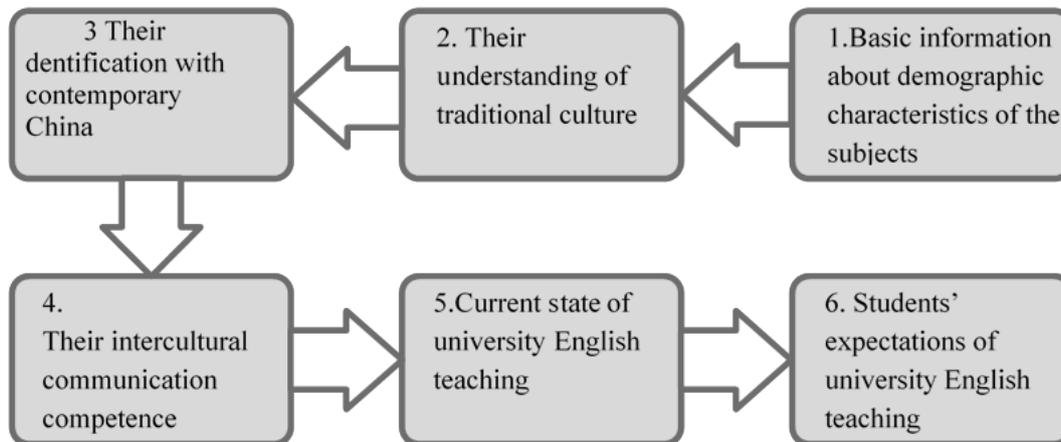
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Appendix 1: Figure 1 (The basic mode of communication in audience's mother tongue)



Appendix 2: Figure 2 (The focus of each section of the questionnaire)



# Factors Influencing College Students' Acquisition of COVID-19 Knowledge: Analysis of Online Questionnaire

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**Abstract:** The COVID-19 epidemic is a public health emergency of international concern, and there is a need to develop evidence-driven strategies for health education and reduce adverse psychological effects for college students during the epidemic. This study aims to survey college students to understand their levels of acquiring knowledge about COVID-19. An online questionnaire was used to collect students' information on demographic data, knowledge about COVID-19, and channels and willingness to acquire knowledge about COVID-19. A significant difference in the passing rate of knowledge about epidemiology and "clinical diagnosis and treatment" was observed between the two groups ( $P < 0.01$ ). It found that awareness of COVID-19 among college students was influenced by their gender, major, residence, and other personal characteristics.

**Keywords:** COVID-19, questionnaire, college students, influencing factors, channels, We-media

## 1. Introduction

Since December 2019, coronavirus pneumonia has strongly infected China and the world [1]. As of 15 July 2020, when this study was undertaken, the total number of confirmed cases around the world has exceeded five million, with more than 580,000 deaths. Although the 2019 coronavirus disease (COVID-19) epidemic has been effectively controlled in China, the spread of the disease around the world is serious, such as United States, Italy, and Spain. In China, the medical schools in low-prevalence areas have started classes since the end of April, and students have all returned to the schools for onsite teaching. Some schools have gathered occasionally due to the COVID-19 outbreak. Therefore, colleges and universities still adopt lockdown management. Students are not allowed to enter or leave the campus without necessary formalities. The COVID-19 epidemic has caused students with a series of psychological problems, such as anxiety, fear, and depression [2-3]. Thus, understanding the knowledge and awareness of the COVID-19 among college students is necessary. How to carry out health education and intervention on college students for the new infectious diseases in time is also worth studying [4-6].

From February to March 2020, the first-level response to major public health emergencies was launched in China, and large-scale isolation was implemented throughout the country. The questionnaire survey is the only feasible method to understand the psychological status of the public during the epidemic and the level of awareness of COVID-19. Wang et al. (2020) surveyed the general public in China to understand their levels of psychological impact, anxiety, depression, and stress during the initial stage of the COVID-19 outbreak. Their results showed that during the initial phase of the COVID-19 outbreak

in China, more than half of the respondents rated the psychological impact as moderate-to-severe. In addition, approximately one-third reported moderate-to-severe anxiety[7]. In Europe, some scholars (Cagetti MG *et al.*, 2020, Iqbal MR *et al.* 2020) used online questionnaires to investigate the symptoms/signs, protective measures, awareness, perception levels, and management strategy regarding COVID-19 among dentists and healthcare professionals in Italy and the United Kingdom [8-9].

The questionnaire method has the advantages of saving time, money, and manpower, which is convenient to operate. However, the method has also some shortcomings, specifically the online questionnaire survey method, which has a low recovery rate and is difficult to guarantee the results. Hence, these limitations need to be considered and avoided when designing research [10-12].

The study reported in this paper referred to relevant research ideas and data statistical analysis methods at home and abroad [13-15]. Moreover, the study conducted a questionnaire survey through the questionnaire star network survey platform (<https://www.wjx.cn/>) [16-17]. The objective is to understand the degree of knowledge of COVID-19 among college students during the prevention and control of the COVID-19 epidemic, which may provide a scientific basis for health education and psychological counseling.

## 2. Methods

### 2.1 Study sample

Participants in this cross-sectional survey were students currently registered at Guilin Medical University. A total of 4,960 students were selected for the questionnaire survey by using the method of cluster stratified sampling.

### 2.2 Survey development

The questionnaire was self-designed based on the Chinese clinical guidance for COVID-19 pneumonia diagnosis and treatment (The 6th Edition) [18], which is compiled by the National Health Committee. All the participants completed a self-designed anonymous online questionnaire distributed via <https://www.wjx.cn/>, and all survey responses were confidentially treated. The questionnaire consisted of questions that covered several areas: (1) personal data (gender, age, nationality, etc.); (2) the related knowledge about COVID-19 (epidemiology knowledge, clinical diagnosis, and treatment knowledge, etc.); (3) the attitudes and behavioral impact of the COVID-19 outbreak; and (4) ways of acquiring knowledge and willingness to understand the COVID-19.

### 2.3 Statistical analysis

We used frequencies, percentages, and graphical displays for descriptive analysis. We applied the Chi-square test to examine the difference in the level of respondents of all questions in different characteristics. The multivariate logistic regression model was used to further clarify whether and how participants' personal characteristics influenced their awareness. Raw data collected via the website "<https://www.wjx.cn/>" were first transformed into excel files and then analyzed by using the Chinese version of SPSS 19.0. All  $P$  values less than 0.05 were taken as statistically significant.

## 3. Results

### 3.1 Characteristics of participants

A total of 4,960 students were invited to participate in the survey. At the end of the survey, 4,955 valid questionnaires were received (recovery rate 99.9%). Table 1 (see Appendix 1) shows the characteristics of the sample. More females (70.9%) than males (29.1%) participated in the study, and the majority of respondents (68.6%) were Han. Of all respondents, 2,731 (55.1%) were junior students, and 2,224 (44.9%) were senior students. Nearly one-half (48.9%) of our participants received medical-related professional education. Furthermore, 1,080 of the 4,955 (21.80%) respondents' parents had bachelor's degrees or above.

### 3.2 Awareness and influencing factors of COVID-19

#### 3.2.1 Awareness of the COVID-19-related knowledge

The knowledge about COVID-19 was evaluated by the score of the answers. If the score is high, then knowledge is also high. The results showed that scores of COVID-19 knowledge of participants were skewed distribution. The total scores ranged from 0 to 100, with a median of 51.5. To our surprise, no students could answer the questions completely, and only a quarter of students had a 60 score, a passing grade.

Table 2 (see Appendix 2) shows the results of the awareness of COVID-19. COVID-19-related knowledge is structured into three domains. The total point is 100, with 43.5 points in epidemiology, 50.5 points in clinical diagnosis and treatment, and 6 points in self-perception. The passing rates of knowledge about epidemiology and clinical diagnosis and treatment were 49.20% and 19.80%, respectively. And a significant difference in the passing rate was

observed between them ( $P < 0.01$ ).

#### 3.2.2 Comparison of the rate of COVID-19 among college students with different demographic characteristics

The results revealed a significant difference in awareness of COVID-19 among gender, grade, major, region of residence, and political party membership ( $P < 0.01$ ). A significant difference in awareness of COVID-19 exists between students from the city and countryside ( $P < 0.01$ ). However, no significant difference in awareness of COVID-19 was found neither between students from towns and countryside nor between city and town ( $P > 0.05$ ). Table 3 (see Appendix 3) shows the data.

#### 3.3 Channels and willingness to acquire knowledge about COVID-19 among college students

##### 3.3.1 Channels and willingness to acquire knowledge about COVID-19

Figure 1 (see Appendix 7) depicts that the most popular channels for college students to acquire COVID-19 knowledge were Micro-blog, Douyin, and other We-media. Of the participants, 86.92% obtained information in this way, followed by TV (83.67%) and WeChat (52.84%). In addition, most college students thought that a small video was the most effective way to promote COVID-19 knowledge on campus (Figure 2, see Appendix 8). This phenomenon indicated that students were more willing to acquire knowledge through We-media compared with traditional media.

##### 3.3.2 Comparison of awareness of COVID-19 among college students

TV, broadcast, newspapers, lectures, and billboards were classified as traditional media, whereas Micro-blog, Douyin, WeChat, and other We-media were classified as electronic new media. The choice of traditional and electronic new media was classified as multi-channel. Compared with participants who acquired knowledge only through traditional media, participants who acquired knowledge through multiple channels had a higher awareness of COVID-19 ( $P < 0.05$ ). "The way of knowledge acquisition," "The willingness to acquire knowledge actively," and "The self-perception that knowledge is sufficient" had an influence on the awareness of COVID-19. The differences were statistically significant ( $P < 0.05$ , Table 4, see Appendix 4).

##### 3.4 Multivariable logistic analysis of factors associated with awareness of COVID-19 among college students

Table 5 (see Appendix 5) shows the multiple logistic regression model predicting the results of COVID-19 cognition. When all eight significant variables were included in the logistic regression model, results show that gender, political party membership, grade, major, region of residence, "whether it is willing to take the initiative to learn," and "knowledge acquisition channels" were the independent factors affecting the awareness of COVID-19.

##### 3.5 Correlation analysis of the COVID-19-related knowledge about behavior and attitude

Whether the COVID-19 knowledge level of college students was related to attitude and behavior was investigated. This survey has 10

topics. Results showed statistically significant differences in awareness of the COVID-19-related knowledge about behavior and attitude between the two groups A and B ( $P < 0.05$ ), as shown in Table 6 (see Appendix 6). The positive attitude was defined as the B group and the negative attitude as the A group. The pass rate of COVID-19 knowledge in group B (23.1%) was slightly higher than that in group A (21.1%). The difference was statistically significant ( $P < 0.01$ ).

#### 4. Discussion and Conclusion

Our findings indicated that the passing rates of knowledge about epidemiology and "clinical diagnosis and treatment" of COVID-19 were 49.20% and 19.80%, respectively. A significant difference in the passing rate was found between the two groups. Gender, major, residence, and other personal characteristics were the independent factors affecting the awareness of COVID-19. We-media was the primary channel for college students to acquire knowledge. A statistical association was observed between the knowledge level of college students' knowledge of COVID-19 and good behavioral attitudes.

Since the spread of the COVID-19 epidemic, China has imposed a lockdown on the population of Wuhan and the entire Hubei province. The current epidemic has been controlled through a series of prevention and control measures, such as the lockdown of the population of Wuhan and group isolation [19-21]. However, phased control does not mean that the new epidemic will not return in the future, specifically before the vaccine is successfully invented [22].

The participants of this survey are all students from the same university, and the teachers invited the students to participate in the survey. The questionnaire response rate was 99.9%. From the perspective of awareness score, only 24.5% of college students can reach the score level of above 60, with a median of 51.5 and the highest score of 91.5, which is generally at a low level. The multivariable logistic analysis indicated that gender, political party membership, grade, major, region of residence, "whether it is willing to take the initiative to learn," and "knowledge acquisition channels" were the independent factors affecting the awareness of COVID-19. Zhao YY *et al.*, (2019) found that regions, gender, age, education level, occupation, and possession of Chinese medicine health culture literacy were factors influencing whether residents obtain Chinese medicine health culture knowledge through the Internet, which was consistent with our result [23].

In the survey, we found that the passing rate of women (24.13%) was higher than that of men (19.51%), which was consistent with the results of other studies [24-25]. This phenomenon was probably related to many factors, such as women's self-management and self-learning ability higher than men's [26-27]. The passing rate of student party members of the Communist Party of China (30.86%) was higher than that of ordinary students (20.81%). This result is probably because most of these students were top students in the class, and their personal qualities and academic achievements were generally better than those of other students. The passing rate of senior students

(31.47%) was higher than that of junior students (15.71%), and the passing rate of medical students (26.30%) was higher than that of non-medical students (19.42%). This study was a survey of medical knowledge. As comprehensive medical professional knowledge increases learned knowledge about COVID-19 may also increase.

In addition, the results showed that the residence of college students was an independent factor influencing the awareness of COVID-19. No significant difference in the pass rate was observed neither between city and town nor between town and countryside. However, a significant difference was found between the city and the countryside. This finding indicated that the living environment of college students has an impact on knowledge acquisition. Moreover, differences exist between urban and rural development in China. The construction of towns in China has been well improved and developed, which is close to the level of cities, and the source and quantity of knowledge and information are similar to cities. However, a large gap still exists between the city and the countryside in terms of economic development, quality of life, and information dissemination [28].

The results suggested that during the epidemic, students acquired their knowledge about COVID-19 mainly through the We-media, such as Micro-blogs, Douyin, and other We-media platforms. Small videos were the most popular health education method for college students. We-media has gradually become the main way for the general public to publish and disseminating information. We-media have the great advantage of rapid dissemination of educational content that can help quickly disseminate important new information, relevant new scientific findings, share diagnostic, treatment, and follow-up protocols. Furthermore, We-media can compare different approaches globally, removing geographic boundaries for the first time in the COVID-19 era [29]. However, probably the worst face of We-media is the potential to disseminate erroneous, alarmist, and exaggerated information that can cause fear, stress, depression, and anxiety in the public [30]. Considering the several users on We-media platforms and their rapid response, they often become the center of public opinion during emergencies. By contrast, the mainstream media dominated by the government are marginalized due to their slow response, and its dominant position is gradually subverted [31-33]. The results showed that the general level of knowledge about COVID-19 among college students was not high, which may be because most of their knowledge came from We-media. Although knowledge is acquired quickly and the amount of information is large, the accuracy is difficult to guarantee. The slow response of the official-dominated mainstream media and the single form of propaganda may be the main reason for the low level of awareness. In the advent of the We media era, the government, mainstream media, and schools need to carry out reforms in the prevention and control of COVID-19 to conduct highly effective and individualized health education for college students.

This study has several limitations. We only sampled one school, which may lead to selection bias. Furthermore, we use a self-designed questionnaire to evaluate relevant knowledge of COVID-19, which is subjective. We also did not include enough knowledge of COVID-19,

such as prevention and control measures. Notwithstanding the above limitations, this study provides invaluable information on understanding the knowledge and awareness of the COVID-19 among college students. Our results could be used as a historical reference. Most importantly, we could conduct a prospective study that would provide a concrete finding to support the need for focused college students' health education and initiative.

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**Appendix 1: Table 1** Characteristics of the respondents in the survey (n=4955).

Participant characteristics		n	%
<b>Gender</b>	Male	1440	29.1
	Female	3515	70.9
<b>Grade</b>	Junior class	2731	55.1
	Senior class	2224	44.9
<b>Major</b>	Medical	2422	48.9
	Non-medical	2533	51.1
<b>Race</b>	Han	3398	68.6
	Ethnic minority	1557	31.4
<b>Region of residence</b>	City	1064	21.5
	Town	1134	22.9
	Countryside	2757	55.6
<b>Political party membership</b>	No	3983	80.4
	The Communist Party of China	972	19.6
<b>Parents' education level</b>	Primary or below	1385	28.0
	Secondary school	2490	50.2
	Bachelor or above	1080	21.8

Appendix 2: Table 2 COVID-19 knowledge of college students (n=4955).

Related knowledge		Score values	Full marks		Pass marks		
			n	%	n	%	
Knowledge of epidemiology	Route of transmission	8	788	15.90	2608	52.63	
	Susceptible population	2	2411	48.66	2411	48.66	
	Incubation period	2	3257	65.73	3257	65.73	
	Definition of suspected cases	8	619	12.49	1967	39.70	
	Definition of confirmed cases	6	913	18.43	3136	63.29	
	Disinfection and sterilization	6	202	4.08	839	16.93	
	Disease prevention and control	9.5	2506	50.58	4691	94.67	
	Infectious disease management	2	1379	27.83	1379	27.83	
	Itemized total	43.5	1	0.02	2438	49.20 <sup>#</sup>	
	Clinical diagnosis and treatment knowledge	Cognition of "self-limited disease"	4	974	19.66	974	19.66
Confirmatory test indicator		6	236	4.76	721	14.55	
Early symptoms		10	1998	40.32	4686	94.57	
Severe symptoms		7.5	607	12.25	2231	45.03	
Treatment strategies		7.5	843	17.01	3171	64.00	
Clinical classification		7.5	150	3.03	2030	40.97	
Discharge standard		8	262	5.29	981	19.80	
Itemized total		50.5	0	0.00	981	19.80 <sup>#</sup>	
Self-perceived issues		Degree of knowledge of COVID-19	1.5	438	8.84	3907	78.85
		Degree of knowledge of suspected exposers	1.5	314	6.34	2717	54.83
	Degree of knowledge of Close contact	1.5	659	13.30	3823	77.15	
	Degree of knowledge of super Communicator	1.5	679	13.70	3398	68.58	
	Itemized total	6	178	3.59	2398	48.40	
total		100	0	0.0%	1214	24.50	

Note: # significant difference ( $P < 0.01$ )

Appendix 3: Table 3 Knowledge of COVID-19 among participants with different characteristics (n=4955).

Characteristics		N	Pass	%	$\chi^2$	P
Gender	Male	1440	281	19.51%	12.346	<0.001
	Female	3515	848	24.13 %		
Grade	Junior class	2731	429	15.71%	173.189	<0.001
	Senior class	2224	700	31.47%		
Major	Medical	2422	637	26.30%	31.055	<0.001
	Non-medical	2533	492	19.42%		
Race	Han	3398	789	23.22%	2.048	0.520
	Ethnic minority	1557	340	21.84%		
Region of residence	City <sup>#</sup>	1064	281	26.41%	12.129	0.002
	Town	1134	264	23.28%		
	Countryside <sup>#</sup>	2757	584	21.18%		
Parents' education level	Primary or below	1385	327	23.61%	3.105	0.212
	Secondary school	2490	600	24.10%		
	Bachelor or above	1080	286	26.48%		
Political party membership	No	3983	829	20.81%	44.862	<0.001
	The Communist Party of China	972	300	30.86%		

<sup>#</sup> The difference was statistically significant,  $P < 0.01$

**Appendix 4: Table 4** Comparison of knowledge acquisition channels and willingness of different students with COVID-19.

Item	n	Pass(%)	$\chi^2$	P
<b>Access to COVID-19 knowledge</b>				
Traditional media	377	639(16.7)	11.418	0.003
New media	526	107(20.3)		
Multiple channels	4052	959(23.7)		
<b>Are you willing to proactively learn about COVID-19</b>				
No	127	16(12.6)	25.213	<0.001
Sometimes	2062	415(20.1)		
Yes	2766	698(25.2)		
<b>Do you think it necessary to carry out educational activities in universities?</b>				
No	182	32(17.6)	2.907	0.088
Yes	4773	1097(23.0)		
<b>Do you think your knowledge of COVID-19 is adequate</b>				
Ambiguity	137	15(10.9)	30.825	<0.001
Inadequate	1691	333(19.7)		
Basic enough	2636	671(25.5)		
Adequate	491	110(22.4)		

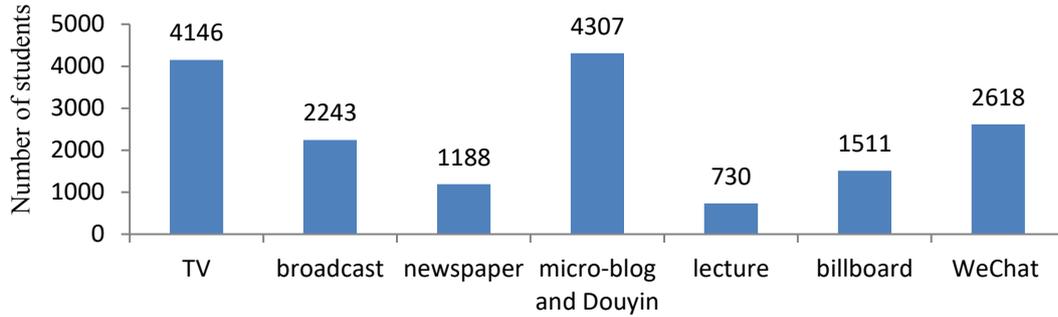
**Appendix 5: Table 5****Table 5** Multivariable logistic analysis of factors associated with cognition of COVID-19 among college students.

Factors	P	OR	95%CI
<b>Gender</b>			
0=Male, 1=Female	0.000	1.402	1.194~1.645
<b>Political party membership</b>			
0=No, 1= The Communist Party of China	0.000	1.371	1.167~1.611
<b>Grade</b>			
0=Junior class, 1=Senior class	0.000	2.769	2.402~3.192
<b>Major</b>			
0=Medical, 1=Non-medical	0.000	2.008	1.743~2.314
<b>Region of residence</b>			
0=City, 1=Town, 2=Countryside	0.002	0.866	0.790~0.949
<b>Be willing to learn</b>			
0=No, 1=Sometimes, 2=Yes	0.000	1.309	1.152~1.488
<b>Access</b>			
0=Traditional media, 1=New media, 2= Multiple channels	0.000	1.267	1.116~1.439
<b>Is the knowledge of COVID-19 is adequate?</b>			
0=Ambiguity, 1=Inadequate 2=Basic enough, 3=Adequate	0.008	1.150	1.037~1.275

**Appendix 6: Table 6** Correlation analysis of the COVID-19 related knowledge about behavior and attitude.

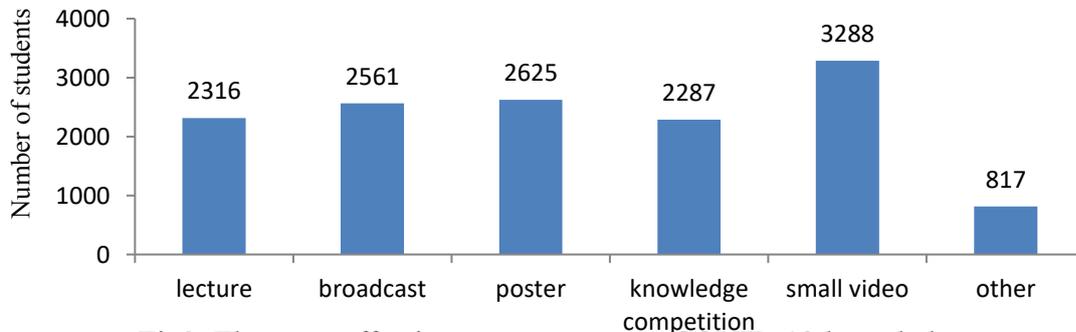
Items	Attitude	Awareness level		$\chi^2$	<i>P</i>
		Fail	Pass		
Do you see a doctor immediately if you have a fever or other symptoms?	Yes (A)	3076	903	0.095	0.758
	No (B)	750	226		
Do you continue to drink raw or untreated water?	Yes (A)	305	62	7819	0.005
Did you eat wild animals before the COVID-19?	No (B)	3521	1067	0.218	0.640
	Yes (A)	280	78		
Do you eat wild animals after COVID-19?	No (B)	3546	1051	15.495	<0.001
	Yes (A)	91	6		
Attitude towards persons from affected areas	No (B)	3735	1123	12.433	<0.001
	Scared (A)	132	16		
Do you wash your hands before eating?	Report (B)	3694	1113	7.899	0.005
	Seldom (A)	148	24		
Do you wash your hands after toilet?	Often (B)	3678	1105	5.622	0.018
	Seldom (A)	38	3		
Is the fruit washed or peeled before eating?	Often (B)	3788	1126	3.702	0.054
	Seldom (A)	172	36		
Do you strictly follow the rules, such as not visiting or wearing a mask ?	Often (B)	3654	1093	7.059	0.008
	Violate (A)	108	16		
Are you scared of COVID-19?	Obey (B)	3718	1113	1.808	0.179
	Yes (A)	1720	482		
Group	No (B)	2106	647	14.222	<0.001
	A	6070	1626		
	B	32190	9664	41854	

**Appendix 7: Figure 1**



**Fig1** Channels to obtain knowledge about COVID-19

**Appendix 8: Figure 2**



**Fig2** The most effective way to promote COVID-19 knowledge on campus