

Influence of PE Teachers' Competence on Students' Physical Literacy

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Abstract: The study determined the predictive influence of PE teachers' teaching competencies on students' physical literacy. The measure of the PE teachers' competencies was based on the TPACK framework. It has the following sub-variables: technological, content, pedagogical, technological content, technological pedagogical, and technological pedagogical and content competencies. On the other hand, student physical literacy was measured as the combination of motivation, knowledge, and physical competence. The survey showed that PE teachers' have poor teaching competencies, and the students have poor physical literacy. Using multiple linear regression analysis, the researcher was able to establish the predictive influence of teaching competencies on student' physical literacy. The result of the study has implications on the promotion of physical literacy among students. PE teachers' teaching competencies must be a part of the conversation about students' physical literacy. The schools must recognize the need to address the poor state of PE teachers' competencies if they wish to bolster the promotion of physical literacy among students.

Keywords: PE Teachers; Teaching Competencies; Physical Literacy.

1. Introduction

In recent years, particular attention has been paid to the role of human and social capital in economic development [1]. In the pillars of development formulated by the World Economic Forum [2], one factor for economic competitiveness is the people's health. A healthy population means a country has strong human capital. This is why governments care for their citizens' health and monitor health concerns. According to the World Health Organization [3], overweight and obesity are included as global health concerns with a prevalence of 18% to 19% (overweight) and 6% to 8% (obesity) among children and adolescents. What is worrying is that the cases of overweight and obesity continue to rise globally. Weight problem is also a serious public concern in China with 50% of adults and 20% of school-age children being overweight or obese [4]. It is projected that by 2030 the cases of overweight and obesity in China will reach 65.3% among adults and 31.8% among children and adolescents [5]. Weight problem is a serious health risk because it is a factor in many chronic diseases which can cost China around 61 billion dollars in medical expenses by 2030.

A globally recognized intervention to combat overweight and obesity is the promotion of physical activity. One of the strategies for physical activity promotion among children and adolescents is physical education (PE). Developing physical activity in PE is important because it trains the young ones to a healthy habit formation which will impact their adult life [6]. Moreover, high-quality physical education promotes people's development [7]. The promotion of physical activity in PE is also being done in China. It can be seen in school PE where mandatory physical fitness tests are being done. While the Chinese PE curriculum focuses on the development of athletic ability, healthy behavior, and sports morality, Dai et al. [8] claims that physical literacy is embodied within the curriculum. They added that physical education supports the development of the skills, knowledge, and attitude necessary for physical literacy.

Physical literacy is the foundation of sustained lifelong physical activity engagement [9]. The International Physical Literacy Association (IPLA) has defined physical literacy as the motivation, confidence, physical competence, knowledge, and understanding to value and take responsibility for engagement in physical activities for life [10]. The multifaceted nature of physical literacy can be seen in many models. Cornish et al., [11] claim that the concept of physical literacy has affective, cognitive, and behavioral domains. According to Young et al. [12], the three domains in Cornish et al., [11] concept of physical literacy represent a holistic approach to physical activity based on social processes.

On the other hand, Holler et al. [13] came up with more sub-factors for physical literacy. Their model of physical literacy includes physical competence, understanding, motivation, confidence, physical activity behavior, and knowledge. There is also a variety of physical literacy models that were developed by Chinese researchers. The physical literacy model of Lou et al. [14] has the following sub-factors: motor skills, motion skills, physical activity, cognition of physical activity, cognition of healthy lifestyle, motivation to participate in physical activity, and confidence to participate in physical activity. Ma et al. [15] modified an old Chinese model for physical literacy and came up with the sub-constructs of confidence and physical competence, motivation, and interaction with the environment.

Physical literacy is an emerging approach to fostering lifelong physical activity. Assessing physical literacy is an important step in monitoring strengths and weaknesses in its development. Given the many models for physical literacy, it is important to choose a scale that has the most common elements. According to Ma et al., [15], many studies claim that the attributes of physical literacy are mainly concentrated on motivation, physical competency, and knowledge. These three elements can be found in the models of IPLA [10], and Holler et al. [13]. Competence and motivation are also included in the physical literacy model of Ma et al. [15] for Chinese adolescents. In the other Chinese model developed

by Luo et al. [14], the sub-factors of physical activity and confidence to do physical activity can be regarded as physical competence while cognition of healthy lifestyle and physical activity may be considered knowledge. Their model has motivation also which was termed as motivation to participate in physical activity. Based on this information, the study used motivation, physical competence, and knowledge as parameters for measuring physical literacy.

Developing physical literacy among college students is important because it is associated with lifelong learning in a healthy lifestyle [16]. According to Shearer et al. [17] the higher the levels of physical literacy, the more confident and capable an individual is in physical activities. PE teachers will play an important role in this process, and even students recognize it [18]. According to Anggara et al. [19], teacher competence is one of the factors that influence physical education learning. Currently, the effectiveness of teachers in developing students is always seen in the teachers' competence paradigm [20].

Competence enables a teacher to develop effective teaching practices [21]. It is a set of cognitive dispositions functionally responsive to specific contexts [22]. In the context of China's PE modernization in college, Li and Hu [23] explored the competencies needed for PE teachers in universities. They developed a core competency composed of moral, educational competence, teaching competence, and research competence. Educational competence refers to the ability of PE teachers to use technology in instruction, their specialized knowledge in sports, and their capability to pursue professional development. Meanwhile, teaching competence constitutes specialized knowledge in PE and innovative teaching skills.

During the pandemic, the technological aspect of Li and Hu's [23] educational competence proved to be indispensable. A lot of attention was given to the ability of PE teachers to integrate information literacy and incorporate technology in their lessons. Since the use of information communication technology in education has continued even after the pandemic, the technological competence of PE teachers remains to be very important. Teachers are expected to incorporate technology in teaching PE so that students become digitally literate [24]. Recognizing the role of technology in today's PE instruction, Li and Hu's [23] educational and teaching competencies of PE college teachers can be associated with pedagogical knowledge, content knowledge, and technological knowledge (TPACK). The Chinese PE teachers' ability to use technology in instruction is related to technological knowledge (TK). Meanwhile, their specialized knowledge in sports and PE can be linked to content knowledge (CK). Lastly, innovative teaching competence can be associated with pedagogical knowledge (PK).

The study measured the competencies based on the TPACK model. As discussed earlier, the competencies needed by Chinese PE teachers in higher educational institutions as identified by Li and Hu [23] can be regarded as technological, pedagogical, and content-related competencies. Similar to the study conducted by Tanuca et al. [25], involving Filipino PE teachers, this study also included the interactions between pedagogical, content, and technological abilities as parameters of the overall competence. In all, the sub-factors of the PE teachers' competence are technological competence, content competence, pedagogical competence, pedagogical and content competence, technological and content

competence, technological and pedagogical competence, and technological, pedagogical, content competence.

Several studies have been conducted focusing on teachers' competence, and physical literacy but there are still research gaps. According to Li and Hu [23], there is still a notable gap regarding the competencies of PE teachers in higher education settings. Most of the studies on the competence of PE teachers are in basic education. Studies on physical literacy are also done mostly in the lower levels of education. The physical literacy of Chinese college students remains to be further explored (Lou et al., 2022). Chinese researchers have not yet established the impact of PE teachers' competence on physical literacy.

The idea that PE teachers' competence can impact physical literacy stems from the simple fact that physical activities are part of PE instruction. Physical literacy can be seen as a learning outcome facilitated by the PE teacher. According to Hernaiz-Sanchez et al. [26], PE teachers must gain the necessary competence to promote physical literacy. It implies that teachers must have some specialized competence in cultivating physical literacy, as Gleddie et al. [27] claim that physical literacy is not given priority in traditional physical education. The question now is whether the PE teachers' competencies in delivering successful instruction in PE are enough to promote physical literacy. Priadana et al. [28] tried to answer the question by conducting a study involving Indonesian PE teachers in the elementary school. Their study showed that PE teachers' competencies contribute significantly to their students' physical literacy. This study delved into the same topic but in the context of Chinese higher education. What is different in the present study are the parameters that measure PE teachers' competencies, and the students' physical literacy.

The study is anchored on the technological pedagogical content knowledge (TPACK) framework developed by Mishra and Koehler [29]. The framework presents the teacher's knowledge in terms of the three separate attributes: technological, pedagogical, and content. It also includes the combinations of the three: technological pedagogical, technological content, pedagogical content, and technological pedagogical content. Central to the TPACK framework is the integration of technology in teaching and learning. A successful technology-based teaching requires understanding of how technology enhances pedagogy and content delivery. Since technological competence is now essential in the present education landscape in China [23], it is logical to situate the assessment of PE teachers' competence within the TPACK framework. The implementation of TPACK design in teaching and learning has positive impact on students. Yanti and Riandi [30] reported that the TPACK competencies of science teachers has a positive influence on the activeness of students in learning. Since physical literacy is a learnable competency in physical education, it can be impacted by TPACK also. According to Cendra et al. [31], the integration of technology has a significant impact on physical education. It can be assumed, therefore, that TPACK competence of PE teachers have predictive influence on students' physical literacy.

2. Methodology

The study followed the quantitative method. It generated quantifiable descriptions of PE teachers' TPACK competencies and PE students' physical literacy for multiple linear regression analysis. The different attributes of TPACK

competencies were considered as independent variables and the overall students' physical literacy as dependent variable. The study used survey to gather data. It used a researcher-developed instrument which was validated by experts, and pilot-tested. The instrument showed a good level of reliability. The respondents of the study were 374 PE students randomly selected from 13,600 students in three selected higher education institutions in Inner Mongolia Autonomous Region, China. They assessed their PE teachers' TPACK competencies and self-assessed their physical literacy.

3. Results and Discussion

Table 1 shows the model of PE teachers' competencies as predictor of physical literacy. The model indicates that the PE teachers' poor TPACK competencies, and the students' low physical literacy are associated. The combination of the predictors account for 41.1 % ($R^2 = 0.411$) of the variance in physical literacy. Pedagogical competence has the biggest predictive influence of 0.192 ($Beta = 0.192$, $Sig = .000$) on physical literacy. For every unit change in physical competence, a change of 0.192 will be seen in physical literacy. Technological pedagogical competence comes in next with a Beta of 0.149 ($Sig = .000$). With regards to pedagogical content competence, a unit change in it will result to a 0.124 change in physical literacy. Content competence, and technological, pedagogical, content competences have predictive influence also on physical literacy with their Betas of 0.075 and 0.073 respectively. The smallest predictive influence which is a factor of 0.072 belongs to technological competence.

Table 1. Innovation Culture

Independent Variables	R^2	Beta	Sig
Technological	0.411	0.072	.017
Pedagogical		0.192	.000
Content		0.075	.010
Technological Pedagogical		0.149	.000
Pedagogical Content		0.124	.000
Technological, Pedagogical, Content		0.073	.014

The finding conforms with the study of Padriana et al. [28]. They found out that the physical literacy of Indonesian students is influenced by the physical education teachers' competence. According to Anggara et al. [19], teacher competence is one of the factors that influence physical education learning. Currently, the effectiveness of teachers in developing students is always seen in the teachers' competence paradigm [20].

4. Conclusion

The predictive influence of PE teachers' teaching competence on the students' physical literacy has implications on physical education. In the current study, the poor teachers' competence explains partly the low level of students' physical literacy. It indicates that the physical skills and healthy behavior objectives in PE are not being met because of the poor teaching competencies. It also implies that PE teachers' professional development must be included in the physical literacy conversation. If schools wish to foster adequate physical literacy among its students, they should

support also the professional development of the PE teachers. The finding also highlights the need to determine other factors that influence students' physical literacy.

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