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Poverty Rate VS TPACK Mastery: A Study of Physical Education Teachers Candidate from Low-Income Families

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Abstract

This study examined the mastery of Technological Pedagogical Content Knowledge (TPACK) for Physical Education (PE) teachers candidates from low-income families. Candidate teachers from low-income families have less access to information technology, so this research examines the mastery level of TPACK among physical education teachers from low-income families. This research used a quantitative approach with a survey method. The survey instrument utilized a TPACK survey to assess the mastery of technology in the teaching and learning process. The participants involved in this study were 146 students who received the Kartu Indonesia Pintar (KIP) Scholarship (government scholarship) and came from low-income families. The results showed that the candidate teachers were included in a Good TPACK skills category. This result indicates that low income does not affect the ability to master TPACK skills. This study rejects the notion that low-income students have low mastery of technology.

Keywords: Physical Education, Pre-service Teachers, TPACK

INTRODUCTION

Private universities in Indonesia are dominated by students who come from low-income families. 71,149 (44%) students study at 123 state universities, and 90,804 (56%) study at 1,941 private universities. The total number of universities that receive KIP (government scholarships) scholars is 2,064 throughout Indonesia (Pusat Layanan Pembiayaan Pendidikan Kemendikbudristek, 2024). Particularly at STKIP Pasundan, about 39% of students are scholars of government scholarships. Most scholars come from rural areas, so getting internet connectivity and device access takes much work. The learning process for 'home-based learning' and existing Edtech solutions require adequate device and internet access, which candidate teachers from low-income families often need help

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following. Based on this fact, it is assumed that candidate teachers from low-income families can barely master TPAC skills.

Mastery of TPACK in candidate teachers is crucial. It will help facilitate the teaching and learning process in schools, especially in the *school experience programs* (*Pengenalan Lapangan Persekolahan/PLP*). PLP is a mandatory program to train students in school management and teaching. One of the goals of teacher education programs is to promote candidate teachers' self-efficacy in achieving the core task of teaching (Chen, 2003). Nowadays, teaching requires various skills, including pedagogical skills, mastery of learning materials, and various technologies. Pedagogical approaches trained to candidate physical education teachers provide a holistic teaching experience (such as social interaction, challenge, or motor competence) (Fletcher et al., 2020). Through school experience programs, candidate teachers can learn directly on authentic sites (McCracken et al., 2020). Another study also revealed that tutorials in tertiary institutions would be more effective in a school environment to increase candidate teachers' student engagement (Herbert & Hobbs, 2018). Findings revealed that peer coaching facilitated teacher candidates' reflection by (a) helping them face and overcome barriers to reflection, (b) linking planning, instruction, and reflection, and (c) providing a three-dimensional perspective. Findings support that peer coaching can be a viable tool for initiating and sustaining teacher candidates' reflection (Lee & Choi, 2013).

In addition, candidate teachers have a high interest in professional teacher education (Ralph & MacPhail, 2015). In the Indonesian educational system, professional education is mandated for teachers and is considered an effective learning method. It program proposes that physical education teacher education programs design learning experiences that improve future physical education teachers' pedagogical content knowledge. This program is also crucial for heightening the awareness of culturally relevant pedagogical and social justice issues based on candidate teachers' interpretations of their experiences. (Sato et al., 2019). These results suggest that teacher educators should keep creating learning programs with elements of both fieldwork and on-campus instruction.

Additionally, they should work towards creating student-centered learning opportunities and motivate aspiring physical education teachers to improve adaptability as a crucial learning goal (R. Richards et al., 2018). Furthermore, studies about physical

education curricula add to the current discourse regarding practice-based teacher preparation. The fundamentals of physical education have been covered, along with how to incorporate them into courses and teacher education programs (Ward et al., 2020). Microteaching labs are one way of changing and advancing the quality of classroom learning for candidate teachers (Arstorp, 2018).

Teachers must be able to plan effective and efficient learning. Planning is essential to teaching and learning (Fletcher & Beckey, 2023). It indicates that a good plan will improve the process's meaning and can be evaluated accordingly.

Teachers and candidate teachers must improve their knowledge and skills to incorporate the three subdomains of Technological Pedagogical Content Knowledge (TPACK). It can be achieved through appropriate training (Saltan & Arslan, 2017). Technology in education can enhance formally provided programs and informal peer learning forms of teacher personal development (Hennessy et al., 2022). Physical Education teacher candidates must also have technological pedagogical content knowledge, technological integration self-efficacy, and perceived expectations of instructional technology outcomes (Semiz & Ince, 2012). Pre-service teachers' integration of information and communication technology (ICT) and pedagogy, particularly in lesson planning, is positively impacted by integrated technology and pedagogy support (Janssen et al., 2019). Increasingly sophisticated technological developments are brought into every aspect of learning. TPACK is important for candidates of Physical Education teachers to master.

METHOD

The research utilized in this study is a quantitative approach with a survey method. This research was conducted on students who have completed the School Experience Programs (PLP) Program. Respondents were selected based on students who had taken all courses and accomplished the PLP program. The participants involved were candidate physical education teacher students in the 8th semester with 146 people, 106 male and 40 female. These participants were recipients of Kartu Indonesia Pintar (KIP/government scholarship) from low-income families. Participants involved were less able to access technology due to their low income. All candidate physical education teacher students have received various course materials related to teaching preparation, teaching skills, and learning related to learning support media.

This research data refers to the mastery of technology. Technology refers to digital technology/tools, including computers, laptops, iPods, handheld devices, interactive whiteboards, and software programs. Prof. Denise A. Schmidt-Crawford authorizes the TPAC Survey in this research. A TPACK survey was conducted to obtain data for this study. The materials to be measured are Technology Knowledge (TK), Content Knowledge (CK), Pedagogy Knowledge (PK), Pedagogical Content Knowledge (PCK), Technological Pedagogical Knowledge (TPK), Technological Content Knowledge (TCK), and Technological Pedagogical Content Knowledge (TPACK).

The survey results were calculated with the help of SPSS to determine the Cronbach's alpha coefficient value. The data analysis method uses the Score Interpretation Scale Guide, as in Table 1 below (Ramdani Pathurohman et al., 2023).

Table 1. Score Interpreted

No	Mean Range	Likert Scale
1	0,00 – 1,00	Bad
2	1,01 – 2,00	Not Good Enough
3	2,01- 3,00	Good Enough
4	3,01- 4,00	Good
5	4,01 – 5,00	Excellent

The Cronbach's alpha coefficient for the whole scale was found to be .95, whereas the values of the scale's alpha coefficient for individual factors ranged between .85 and .92 (Kabakci Yurdakul et al., 2012).

RESULT

Respondents in this study were candidate teachers who came from low-income families. They are recipients of government scholarships (KIP). This research involved 106 male respondents and 40 female respondents. Respondents' ages ranged from 18-26 years. 103 respondents were aged 18-22 years, and 43 others were aged 23-26 years. An overview of the respondents' demographic data can be seen in Table 2 below.

Table 2. Demographic Data

Gender	Male	106	
	Female	40	
Age	18-22 Years	103	70,54%
	23-26 Years	43	29,46

This research utilizes the TPACK survey, which consists of aspects of questions regarding Technology Knowledge (TK), Content Knowledge (CK), Pedagogy Knowledge (PK), Pedagogical Content Knowledge (PCK), Technological Pedagogical Knowledge (TPK), Technological Content Knowledge (TCK), and Technological Pedagogical Content Knowledge (TPACK). The survey results are calculated using SPP to determine the mean and standard deviation for each aspect and then determine the level of TPACK understanding of candidate teachers based on the Score Interpretation Scale Guide, as stated in Table 1. The calculation of the mean and standard deviation for respondents can be seen in Table 3 below.

Table 3. TPACK Results on Each Domain

No	TPACK Domain	Mean	Standard Deviation
1	Technology Knowledge (TK)	3,55	0,21
2	Content Knowledge (CK)	3,43	0,20
3	Pedagogy Knowledge (PK)	3,66	0,15
4	Pedagogical Content Knowledge (PCK)	3,46	0,18
5	Technological Pedagogical Knowledge (TPK)	3,39	0,14
6	Technological Content Knowledge (TCK)	3,66	0,07
7	Technological Pedagogical Content Knowledge (TPACK)	3,43	0,17

The results of calculations in the TPACK survey of prospective teachers from low-income families reveal that technology knowledge (TK) ability has an average of 3.55 with a standard deviation of 0.21, which means they have technology knowledgeability in the Good category. Knowledge regarding Content Knowledge (CK) is at a slightly lower value, specifically 3.44, with a standard deviation of 0.20. This value indicates that their Content Knowledgeability is in a Good category. Pedagogy Knowledge (PK) and Technological Content Knowledge (TCK) values are the highest knowledge domains, reaching 3.66 and being in the Good category. Meanwhile, the lowest score is Technological Pedagogical Knowledge (TPK), which is 3.39, although it is still in the Good category. Meanwhile, Pedagogical Content Knowledge (PCK) is at 3.46 with a standard deviation of 0.14 and Technological Pedagogical Content Knowledge (TPACK) is in the Good category with a score of 3.43.

Based on calculations of all aspects of TPACK, it can be concluded that the ability of candidate teachers from low-income families to master TPACK skills is in the Good category. This figure shows that the limitations of candidate teachers from low-income families do not affect TPACK abilities. This research also confirms the rejection conclusion of previous research results that students who encounter economic difficulties have a low ability to master TPACK.

DISCUSSION

A study revealed a relationship between information technology skills and the poverty rate, and the results showed that areas with high poverty rates should correlate with low levels of mastery of technological skills (Endah, 2019). Nevertheless, the outcomes of this research could be more consistent. The study's key finding is the degree of TPACK knowledge among aspiring physical education instructors from low-income backgrounds. Physical education teachers have a solid understanding of TPACK mastery. One of the predictors of TPACK mastery is familiarity with technology and the learning process. Furthermore, based on information gathered from the Indonesian Central Bureau of Statistics (2022), people tend to have more cell phones, internet penetration in Indonesia is relatively high, and the internet is operated for various activities, accessed in various places, and using various access media.

Moreover, everyone can become an internet user, especially for learning. For example, in the learning experience factor, students learn with a curriculum that includes technology and media lessons. At STKIP Pasundan, several courses support the IT Course, Physical Education Instructional Media Course, and Sports Pedagogy. These courses have material related to TPACK. Therefore, all students, including those from low-income families, can access the technology. TPACK is essential to help future educators' teaching readiness (Armiyati & Fachrurozi, 2022; Zulhazlinda et al., 2023). TPACK-based teaching and learning processes are helpful for candidate teachers in enhancing their ability to master the material and integrate it with technology so that the learning process is more interesting and up-to-date. Candidate teacher students with high TPACK Mastery will be more confident designing lesson plans, performing various teaching methods and strategies, and operating various digital learning media (Rosmaladewi et al., 2023). In addition, one important factor is adequate internet access on campus.

Furthermore, computer labs are also one of the solutions for students who still need laptops and computers.

This finding suggests that TPACK mastery is not limited to people close to technology and financially secure but applies to everyone. The results of this study are expected to provide deep insight into the challenges and opportunities that physical education teachers from low-income families face in understanding and integrating TPACK into their teaching practices. Additionally, this study demonstrates that low-income students need more mastery of technology.

CONCLUSION

Physical education teacher candidates must master Technological Pedagogical Content Knowledge (TPACK). This skill will help candidate teachers implement learning materials. This study found that low-income students have a Good Category in mastery of TPACK. The results of this study show that low-income people tend to have a low level of mastery of technological skills. Various factors, including a suitable curriculum and adequate campus facilities, influence students' mastery of TPACK. Courses with proportional hours and the availability of internet access provide opportunities for students to learn more.

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