

Utilization of Technology in Teaching Physical Education and the Performances of PE Faculty Members in a Selected College in Guangdong Province



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ABSTRACT: This study investigates the relationship between Physical Education (PE) teachers' technology integration knowledge and their teaching performance at a Sports School in Huizhou, China. The assessment utilizes a survey questionnaire adapted from prior research by Hosseini (2012) and Hosseini & Kamal (2013) to measure knowledge in technology, content, pedagogical, and content areas. The research explores whether a significant correlation exists between technology integration knowledge and teaching performance among PE teachers. The findings indicate that there is no statistically significant relationship between the ability to develop and conduct online assessments and various dimensions of technology integration knowledge among PE teachers. Despite an average correlation coefficient suggesting a moderately positive relationship, this result lacks statistical significance. Consequently, the data suggests that proficiency in online assessment development does not strongly correlate with a comprehensive understanding of technology integration knowledge.

KEYWORDS: technology integration knowledge, teaching performance, physical education, PE teachers, online assessment, educational technology, Sports School, Huizhou, China.

1. INTRODUCTION

The integration of technology in education has experienced a significant metamorphosis, fundamentally changing the methods through which students acquire knowledge and teachers provide instruction. This shift extends to the field of physical education (PE), where the integration of technology offers promising opportunities to engage today's digital-native learners. Advancements in technology have the capacity to positively transform physical education (PE) classrooms. This is achieved by empowering PE teachers to establish customized and achievable objectives for their students, utilizing a range of technologies including apps, online videos, monitors, and trackers (McVicker, 2018). As a result, this promotes increased student involvement and dedication to physical activity, so encouraging the formation of good habits.

Nevertheless, technology adoption in PE instruction is difficult. PE teachers, who may not be tech-savvy, struggle to adjust to the increasingly tech-driven educational environment (Huang, 2021). PE teachers may find hard to due to restricted availability, training, and perceived value (Baek, 2018). These barriers underscore the need to explore the utilization of technology in the context of physical education and its impact on the performance of PE faculty members.

The COVID-19 epidemic accelerated the digital revolution of education, leading schools in Guangdong Province, China, to switch to online learning (Pasmore, 2020). The brief transition brought about considerable changes in the conventional classroom environment, and it brought to light the significance of technology in the educational system. There was no exceptions to this rule, as physical education classes were also confronted with the difficulty of using technology in order to preserve the quality of physical education during remote learning.

Previous research has extensively examined the various effects of integrating technology into physical education. These effects encompass aspects such as student motivation, autonomy, critical thinking, problem-solving, and physical activity levels (Lucena et al., 2019). In addition, research has demonstrated that technology can be a valuable tool for teachers, enhancing their instructional abilities, productivity, and access to information (Mohnsen, 2012). However, there have been discussions regarding the possible adverse impacts of technology, including social isolation, physical and mental health concerns, and the promotion of unrealistic body ideals (Alghamdi, 2016; Casey et al., 2016).

Therefore, it can be said that the integration of technology in physical education holds great promise but presents unique challenges that need to be addressed. This research sought to contribute to the understanding of how technology can be effectively utilized in the field of physical education and how PE faculty members can navigate the evolving landscape of education while ensuring positive student outcomes and well-being.

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This research aims to investigate the utilization of technology in teaching physical education and its impact on the performance of PE faculty members in a selected college in Guangdong Province. The study examined the experiences and challenges faced by PE faculty members in adopting technology for instructional purposes, the effects of technology on the teacher's performance. By delving into the relationship between technology and PE instruction, this research sought to provide insights that can inform future strategies for enhancing the effectiveness of physical education in the digital age.

Research Question

Is there a significant relationship between the level technology integration knowledge in PE classroom and the teaching performance of the PE teachers?

II. RESEARCH METHODOLOGY

The study aims to assess PE teachers' technology integration knowledge, teaching performance and Teaching performance at a Sports School Huizhou, China. It utilized a survey questionnaire from Hosseini, Z. (2012) and Hosseini & Kamal (2013) study, measuring knowledge in technology, content, pedagogical, and content areas. The research also explored the relationship between technology integration knowledge and teaching performance.

III. RESULTS AND DISCUSSION

Table 1. Relationship on the Assessment of the Teacher-Respondents on the Level of Technology Utilization Knowledge of PE Teachers and the Teaching Performance as PE Teachers

Teaching Performance of PE Teachers	Level of Technology Integration Knowledge of PE Teachers	Computed r	Sig	Decision on Ho	Interpretation
Teaching Methodology	Technology Knowledge	-.05	.56	Accepted	Not Significant
	Technology Content Knowledge	-.00	.93	Accepted	Not Significant
	Technological Pedagogical Knowledge	.14	.12	Accepted	Not Significant
	Technological Pedagogical Content Knowledge	-.03	.69	Accepted	Not Significant
	Average	.02	.76	Accepted	Not Significant
Classroom Management	Technology Knowledge	.04	.63	Accepted	Not Significant
	Technology Content Knowledge	.42	.00	Rejected	Significant
	Technological Pedagogical Knowledge	.05	.52	Accepted	Not Significant
	Technological Pedagogical Content Knowledge	-.12	.18	Accepted	Not Significant
	Average	.25	.00	Rejected	Significant
Knowledge and Skills in Using Technology	Technology Knowledge	.81	.00	Rejected	Significant
	Technology Content Knowledge	.03	.72	Accepted	Not Significant
	Technological Pedagogical Knowledge	-.16	.07	Accepted	Not Significant
	Technological Pedagogical Content Knowledge	-.08	.35	Accepted	Not Significant
	Average	.33	.00	Rejected	Significant
Developing and Conducting Online Assessment	Technology Knowledge	-.03	.70	Accepted	Not Significant
	Technology Content Knowledge	.01	.89	Accepted	Not Significant
	Technological Pedagogical Knowledge	.04	.65	Accepted	Not Significant
	Technological Pedagogical Content Knowledge	.68	.00	Accepted	Not Significant
	Average	.25	.00	Accepted	Not Significant

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Over-all Teaching Performance Of PE Teachers	Over-all Technology Knowledge Teachers	Level of Integration of PE	1	.00	Rejected	Significant
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The comparison of the assessment of the teacher respondents on the level of technology utilization knowledge of PE Teachers in terms of technology knowledge, technology content knowledge, technological pedagogical knowledge, and technological pedagogical content knowledge and the assessment of the teacher respondents on the teaching performance of PE teachers in terms of teaching methodology, classroom management, knowledge and skills in using technology, developing and conducting online assessment.

In the case of teaching methodology and technology knowledge, the computed correlation coefficient is $-.05$ with a significance level of $.56$. Since the significance level is greater than 0.05 , the null hypothesis is accepted, indicating that there is no statistically significant relationship between teaching methodology and technology knowledge. This implies that variations in teaching methodology are not systematically associated with differences in technology knowledge among PE teachers.

Similarly, the correlation coefficients for the relationships between teaching methodology and other dimensions of technology integration knowledge (technology content knowledge, technological pedagogical knowledge, and technological pedagogical content knowledge) are also not statistically significant, as indicated by the acceptance of the null hypothesis in each case. The average correlation coefficient for these relationships is $.02$ with a significance level of $.76$, reinforcing the overall lack of significant correlation between teaching methodology and technology integration knowledge.

The lack of statistical significance across all dimensions suggests that, based on the provided data, there is no strong linear relationship between the teaching performance of PE teachers in terms of methodology and their level of technology integration knowledge. This finding is important as it implies that variations in how PE teachers implement teaching methodologies are not directly tied to differences in their technological knowledge, technological pedagogical knowledge, or technological pedagogical content knowledge.

In practical terms, this means that the proficiency of PE teachers in utilizing technology in their teaching does not appear to be systematically related to their performance in traditional teaching methodologies. However, it's important to note that correlation does not imply causation, and further research or a larger dataset may be necessary to draw more robust conclusions about the relationship between teaching performance and technology integration knowledge among PE teachers.

For the relationship between classroom management and technology knowledge, the computed correlation coefficient is 0.04 with a significance level of 0.63 . Since the significance level is greater than 0.05 , the null hypothesis is accepted, suggesting that there is no statistically significant relationship between classroom management and technology knowledge. This implies that variations in classroom management are not systematically associated with differences in technology knowledge among PE teachers.

However, a different pattern emerges when examining the relationship between classroom management and technology content knowledge. In this case, the computed correlation coefficient is 0.42 with a significance level of 0.00 . The significance level being below 0.05 leads to the rejection of the null hypothesis, indicating a statistically significant positive relationship between classroom management and technology content knowledge. This implies that PE teachers with higher levels of technology content knowledge tend to exhibit better classroom management skills. This finding is noteworthy as it suggests a potential link between a specific aspect of technology knowledge and a critical teaching skill.

For technological pedagogical knowledge and technological pedagogical content knowledge, the computed correlation coefficients are 0.05 and -0.12 , respectively, with significance levels of 0.52 and 0.18 . In both cases, the null hypothesis is accepted, indicating no statistically significant relationship between classroom management and these dimensions of technology integration knowledge.

The average correlation coefficient for all relationships is 0.25 with a significance level of 0.00 . Since the significance level is below 0.05 , the null hypothesis is rejected, suggesting an overall statistically significant relationship between classroom management and the average of technology integration knowledge dimensions. However, it's important to note that this average includes the significant relationship specifically found with technology content knowledge.

In summary, the data indicates that while there is no significant relationship between classroom management and general technology knowledge, there is a significant positive relationship between classroom management and technology content knowledge. This implies that, among PE teachers, possessing higher levels of knowledge about the content of technology is associated with better classroom management skills. Further exploration into the nature of this relationship and potential implications for professional development may be warranted.

For the relationship between knowledge and skills in using technology and general technology knowledge, the computed correlation coefficient is 0.81 with a significance level of 0.00 . Since the significance level is below 0.05 , the null hypothesis is rejected, signifying a statistically significant positive relationship between knowledge and skills in using technology and general technology

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knowledge. This implies that PE teachers who possess higher knowledge and skills in using technology tend to have a more comprehensive understanding of technology in general.

On the other hand, when examining the relationship between knowledge and skills in using technology and technology content knowledge, the computed correlation coefficient is 0.03 with a significance level of 0.72. The acceptance of the null hypothesis suggests that there is no statistically significant relationship between knowledge and skills in using technology and technology content knowledge. This implies that the ability to use technology does not necessarily correlate with specific content-related knowledge about technology among PE teachers.

Similarly, for the relationships between knowledge and skills in using technology and technological pedagogical knowledge, as well as technological pedagogical content knowledge, the computed correlation coefficients are -0.16 and -0.08, respectively. Although these coefficients suggest negative relationships, the significance levels of 0.07 and 0.35 are above the 0.05 threshold. Consequently, the null hypotheses are accepted, indicating no statistically significant relationships between knowledge and skills in using technology and these specific dimensions of technology integration knowledge.

The average correlation coefficient for all relationships is 0.33 with a significance level of 0.00. Since the significance level is below 0.05, the null hypothesis is rejected, suggesting an overall statistically significant relationship between knowledge and skills in using technology and the average of technology integration knowledge dimensions. This indicates that, on average, PE teachers who demonstrate higher knowledge and skills in using technology tend to exhibit a more comprehensive understanding of technology integration.

In summary, the data shows a strong and statistically significant positive relationship between knowledge and skills in using technology and general technology knowledge among PE teachers. However, there is no statistically significant relationship between these skills and technology content knowledge, technological pedagogical knowledge, or technological pedagogical content knowledge. The overall significant relationship with the average of technology integration knowledge dimensions implies a broad association between proficiency in using technology and a comprehensive understanding of technology integration in the context of physical education. For the relationship between developing and conducting online assessments and general technology knowledge, the computed correlation coefficient is -0.03 with a significance level of 0.70. Since the significance level is above 0.05, the null hypothesis is accepted, suggesting that there is no statistically significant relationship between the ability to develop and conduct online assessments and general technology knowledge. This implies that proficiency in online assessment development does not necessarily correlate with a comprehensive understanding of technology in general among PE teachers. Similarly, when examining the relationship between online assessment development and technology content knowledge, technological pedagogical knowledge, and technological pedagogical content knowledge, the computed correlation coefficients are 0.01, 0.04, and 0.68, respectively. In all cases, the significance levels are above 0.05, leading to the acceptance of the null hypothesis. This indicates no statistically significant relationships between the ability to develop and conduct online assessments and these specific dimensions of technology integration knowledge. Therefore, online assessment development skills do not appear to be significantly associated with these particular facets of technological knowledge among PE teachers.

The average correlation coefficient for all relationships is 0.25 with a significance level of 0.00. Since the significance level is below 0.05, the null hypothesis is accepted, suggesting no statistically significant relationship between the ability to develop and conduct online assessments and the average of technology integration knowledge dimensions. This indicates that, on average, PE teachers' proficiency in online assessment development does not systematically align with their broader understanding of technology integration. In summary, the data suggests that there is no statistically significant relationship between the ability to develop and conduct online assessments and various dimensions of technology integration knowledge among PE teachers. While the average correlation coefficient indicates a moderate positive relationship, this finding is not statistically significant, emphasizing that, according to the provided data, proficiency in online assessment development does not strongly correlate with a comprehensive understanding of technology integration knowledge. The correlation coefficient (r) between the overall teaching performance of PE teachers and their overall level of technology integration knowledge is 1.00, indicating a perfect positive correlation, and the significance level (Sig) is 0.00. The rejection of the null hypothesis suggests a statistically significant relationship between overall teaching performance and overall technology integration knowledge among PE teachers.

A correlation coefficient of 1.00 signifies a perfect positive linear relationship, indicating that as one variable (in this case, overall teaching performance) increases, the other variable (overall level of technology integration knowledge) also increases proportionally. The significance level of 0.00 further strengthens the conclusion that this relationship is not due to random chance but is statistically significant. Interpreting this result, it can be inferred that, according to the provided data, there is a significant and positive association between the overall teaching performance of PE teachers and their overall level of technology integration knowledge. This suggests that PE teachers who exhibit higher proficiency in integrating technology into their teaching methods tend to have better overall teaching performance.

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IV. CONCLUSION

The implications of this finding are notable. It underscores the importance of technology integration knowledge in contributing to overall teaching effectiveness in the context of physical education. PE teachers with a comprehensive understanding of how to incorporate technology into their instructional practices may be better equipped to engage students, tailor their teaching methods to diverse learning styles, and create a more dynamic and effective learning environment. While the data indicates a significant positive relationship, it is important to note that correlation does not imply causation. The observed association suggests a connection between teaching performance and technology integration knowledge, but further research and exploration are needed to understand the nature of this relationship. Additionally, the context-specific nature of teaching performance and technology integration in physical education warrants a more nuanced investigation to uncover specific factors contributing to this correlation. This study highlights the importance of technology integration in physical education, highlighting the potential benefits of technology in teaching. It suggests that PE faculty can use technology to enhance student engagement, learning outcomes, and overall quality. However, the study acknowledges that the correlation does not imply causation and that factors like teaching style, pedagogical approach, and specific technologies may influence this relationship. It also suggests that the context-specific nature of teaching performance and technology integration in physical education necessitates further research. The study emphasizes the need for ongoing research and adaptation to fully harness the benefits of technology in education.

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