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Educational technology standards in physical education and health beliefs of students: The mediating role of physical activity self-efficacy

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Abstract
The study aimed to find out the mediating effect of physical activity self-efficacy (MV) on the relationship between technology standards in physical education (IV) and the health beliefs of students (DV). This research used descriptive correlation and mediation techniques method. This study involved 303 respondents and utilized a stratified random sampling technique for data gathering, done electronically through email with a link to the Google form-made questionnaire sent to respondents. Mean, Pearson-r, and Med-graph using Zobel's z-test statistical tools were used. The results found a high descriptive level for IV, no overall result for DV, yet individually computed per indicator, and a moderate descriptive level for MV. Whereas a significant relationship was found between the IV and three indicators of the DV, no significant relationship was found for the other two indicators of the DV. At the same time, a significant relationship was found between the IV and the MV and between the MV and the four indicators of the DV, except for one. Lastly, the results revealed a full mediation effect between the relationship between IV and an indicator of DV and a partial mediation effect between the relationship of the IV and to other two indicators of DV. Implications of the study were also provided in this paper.

Keywords: Educational technology standards in PE, health beliefs, physical activity self-efficacy, descriptive- correlational and mediation technique, Philippines

Introduction
Throughout human civilization, beliefs during pandemics and health crises have significantly impacted public health, causing havoc, panic, and anxiety (Scheidel W, 2018) [1]. Misleading health beliefs can lead to false information and affect people's lifestyles and health practices (Kilgo, Yoo & Johnson, 2019) [2]. In the Philippines, some rural Filipinos prefer self-diagnosis and alternative treatments, worsening their health conditions (Stanford School of Medicine, 2019) [3], which highlights the potential risk behaviors associated with health beliefs, negatively affecting overall well-being (Jose, *et al*., 2020) [4].
Research has shown that individuals with poor health beliefs may struggle to adhere to their health conditions' recovery, compared to those with strong self-belief (Enarson & Walsh, 2018) [5]. During health emergencies, engaging in preventive practices is vital, especially for vulnerable groups like children, older adults, indigenous persons, and disabled individuals (Sunhee Kim & Seoyong Kim, 2020) [6]. Studies in Hong Kong have revealed varying responses about preventive measures for disease infection, indicating a lack of clarity among respondents (Kwok S. *et al*., 2020) [10].
Information from instructional technology and internet/media platforms can influence individuals' health-related behaviors, including engagement in positive health-belief interventions (Montesi M., 2021) [7]. Engaging in physical activity is considered a self-efficacy behavior, promoting an individual's desire for fitness and exercise (Najarkolaei *et al*., 2015; Ye, Zhou & Wu, 2020) [8, 9]. Technology's role in providing health information can foster self-efficacy behaviors towards well-being (Wu, 2020) [9].
While research has explored educational technology standards (ETS) for teachers and students (Parker, J., 2021) [11], health beliefs among adults (Kilgo, Yoo & Johnson, 2019) [2], and physical activity self-efficacy (Roldan & Reina, 2021) [12], limited attention has been given to the relationship between ETS in physical education and students' health beliefs, along with the mediating effect of physical activity self-efficacy.

This study aims to fill this gap by examining these variables' interconnectedness, providing valuable insights into students' health beliefs, fitness interventions, and holistic well-being. The locale chosen for this study is Thailand, given the researcher's current work location, enabling future comparative analyses across different cultural practices and educational settings.

Methods

This research utilized a descriptive-correlational research design with mediating techniques to examine the relationship between educational technology standards in physical education, health beliefs of students, and physical activity self-efficacy. The study was conducted in the Province of Lampang, Thailand, where the researcher currently works and is interested in exploring the practices and beliefs of Thai students.

The population consisted of students aged 18 and above, enrolled in physical education classes during the academic year 2021-2022 in selected schools in Lampang. The sample was determined using stratified random sampling, with a total of 303 students, and a final sample size of 31 was used for the reliability test.

Data collection was done online due to COVID-19 preventive measures, using 'Google Forms' as the platform. The questionnaires were translated into Thai to accommodate the language preferences of Thai students. The research instruments were validated and pilot-tested with satisfactory reliability scores.

Statistical tools employed in the study included mean to assess the levels of educational technology standards, health beliefs, and physical activity self-efficacy. Pearson r was used to determine the relationship among variables, while the med-graph using Sobel's z test was utilized to assess the significance of the mediation effect of physical activity self-efficacy.

Ethical considerations were carefully followed, with voluntary participation of students and the assurance of privacy and confidentiality of their data. Informed consent was obtained, and potential risks were addressed. Plagiarism, fabrication, dishonesty, and conflicts of interest were avoided, and the study adhered to ethical guidelines throughout.

Results and Discussion

Level of Educational Technology Standards in Physical Education: Based on the mean ratings, the level of educational technology standards in physical education was perceived to be high. Among the indicators, social, ethical, legal, and human issues obtained the highest mean score of 3.99, followed by technology operations and concept with a mean score of 3.94, both described as high. Other indicators, such as productivity and professional practice (mean score of 3.83), planning and designing learning environments and experiences (mean score of 3.77), assessment and evaluation (mean score of 3.69), and planning of teaching according to individual differences and special needs (mean score of 3.49), were also described as high.

Level of Health Beliefs of Students

The level of health beliefs of students was assessed individually for each indicator. The benefits for exercise obtained the highest mean score of 3.73, categorized as a high level, while the perceived health problems garnered the lowest mean score of 1.75, indicating a very low descriptive level. Other indicators, including barriers for exercise, cues to action for exercise, and significant others' help for exercise, were described as low in terms of health beliefs.

Level of Physical Activity Self-Efficacy

The level of physical activity self-efficacy was perceived to be at a moderate level, with an overall mean score of 2.95. Among the indicators, students and time received moderate mean scores of 3.29 and 2.98, respectively. The space and institution indicators were also described as moderate, with mean scores of 2.91 and 2.63, respectively.

Correlation Analyses of the Variables

Pearson Product Moment Correlation analyses were conducted to determine the relationships between the variables. Educational technology standards in physical education showed no significant correlations with perceived health problems and barriers for exercise. However, they had a positive and significant correlation with health beliefs related to benefits for exercise, cues to action for exercise, and significant others' help for exercise. Furthermore, educational technology standards in physical education had a positive and significant correlation with physical activity self-efficacy.

Physical activity self-efficacy exhibited positive and significant correlations with all health belief indicators, including benefits for exercise, cues to action for exercise, barriers for exercise, perceived health problems, and significant others' help for exercise.

Mediation Analysis of the Three Variables

The study conducted mediation analyses to determine the effect of physical activity self-efficacy as a mediator between educational technology standards in physical education and health beliefs of students. Full mediation was achieved in the relationship between educational technology standards and cues to action for exercise, indicating that physical activity self-efficacy fully mediates this relationship. Partial mediation was observed in the relationships between educational technology standards and benefits for exercise and significant others' help for exercise, suggesting that physical activity self-efficacy partially mediates these relationships.

Overall, the results indicate the importance of physical activity self-efficacy in mediating the relationship between educational technology standards in physical education and certain health beliefs of students. These findings provide valuable insights into how physical activity self-efficacy plays a role in shaping students' health beliefs and can aid in developing effective fitness interventions in physical education settings.

Conclusion

The findings of this study highlight the importance of educational technology standards and physical activity self-efficacy in shaping students' health beliefs and engagement in physical activities. The integration of educational technology in physical education classes can positively influence students' perception of the benefits of exercise and the support they receive from others. However, it is essential to recognize that perceived health problems and barriers to exercise may not be directly influenced by educational technology standards and physical activity self-efficacy.

Recommendations

Based on the study's results, we recommend that educational institutions continue to support teachers in integrating educational technology into physical education classes.

Professional development programs and resources, such as instructional videos and tracking mechanisms, can enhance students' learning experiences and motivation to engage in physical activities. Furthermore, promoting a positive physical learning environment with adequate space and institutional support can contribute to improving students' physical activity self-efficacy.

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Conflict interest
The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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