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Physical education teacher's attitudes and practice towards technology integration into teaching physical education at the senior high schools in Kumasi, Ghana

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Abstract
This study investigated physical education teachers' attitudes and practice towards technology integration into teaching physical education at the senior high schools level. Descriptive survey method was adopted for the study. Sixty respondents were sampled and administered a 26-items questionnaire of Physical Education Teachers' Attitudes and Technology Practices Inventory of four factors examined on a Likert scale format. The instrument yielded a reliability scores using Cronbach's alpha coefficient for each factor perceptions of relevance and importance of technology yielded (α=.68); physical educators' teaching style and beliefs yielded (α=.72); physical educators' technology proficiency and use yielded (α= .75) and contextual factors yielded (α=.70). The instrument overall yielded α = .75 for the internal consistency. Three research questions were answered, and hypothesis tested. Data was analysed using descriptive statistics and inferential statistics. The results revealed that respondents acquired requisite skills and training in technology, and also have competent level regards to technology integration. The results indicated that a strong relationship exists between teachers' perceptions of importance/relevance and technology use (r =.316, p<.05). Also significant correlation was found between physical educators' perceptions of importance/relevance and teaching style (r =.254, p<.05) on technology integration into teaching. A significant correlation was found between technology proficiency and teaching style (r =.272, p<.05). It was recommended that educational strategies should be redirected, and new educational models adopt to teach integrating technology that links the main components in the educational process.

Keywords: Attitude, Physical education, Instructional technology, Technology integration

Introduction

Technology use in schools has influenced the way teaching are plan, design instruction and assess of students. Thus, innovation in educational technology has changed systems of communication, learning, resources, less ideas and professional development [18, 27]. Innovation technology facilitates creativity and learning productivity. Yet little is known about physical educators' predispositions and use. Indications have shown that elite sports organization take advantage of the latest technology to enhance sports performance.

Technology consists of computer programmes, internet programmes or other assertive, digital and communicative tools [10]. The world has become a global place due to technology, through which people can have access to reach relevant source of information from all over the world within the shortest possible time. [8] describe technology as a range of equipment (hardware; personal computers, scanners and digital cameras) and computer programmes (software; database programs and multimedia programs) and the telecommunication infrastructure (phones, faxes, modems, video conferencing equipment and web cameras) that allow access, retrieve, store, organize, manipulate, present, send materials and communicate locally, nationally and globally through digital media.

Disciplines such as physical education are not free from these challenges. Occasionally, questions are asked by physical educators and other teachers why technology into physical education teaching? This usually turns into discussion about what does technology do with concern over replacement of physical activity. It might seem that the gymnasium would be the last place where technology would have a strong influence in curriculum and instruction.

Technologies are widely used as educational tools in areas of sport, physical activity and health, but physical educators do not feel confident to integrate technology in their teaching careers [20, 14]. Confirmed that the accelerated adoption and use of information and communication technology (ICT) has resulted in the globalization of information and knowledge resources. Classroom teachers' have integrated these forms of technology over time using a variety of methods through different styles and practices in education [3, 9, 16].

Although discipline specific technology has been developed, generally, technology inclusion has not become commonplace in physical education due to limitations such as: lack of training, personal comfort levels, availability of equipment, space and time [23]. Though, physical educators can integrate technology through a variety of approaches. This [28] opined that the approaches include: preparing, generating, administering and reporting information such as fitness, stores,

class participation or motor skill rubrics grades for both students and teachers completed more efficiently.

In additional to normal everyday technology use, physical education programmes can be structured based on the enhancement of content-specific technology. Technology has become an important part of work and home environments throughout the country, and apparently among the youth population. It is believed that children entering first grade are estimated to spend on average of 51 minutes per day playing video games and 14 minutes per day using computers, in addition to 172 minutes every day viewing television. By the time children reach age twelve [12], their average "screen time" has increased to 109 minutes of video gaming and 79 minutes of computer usage [12].

Physical educators can include the use of word and desktop publishing for items like newsletters, information packets, or student portfolios. Moreover, technology can be used for fitness assessment databases, physical education department web pages, content-based software programmes, multimedia systems and visual presentation. [25] stated that digital videos, exer-gaming equipment and other fitness-related devices may be incorporated into daily assignments and unit planning.

The act of teaching and organization of instructional materials can further be developed through the use of internet for increased communication, resources, and lesson ideas [9]. Thus, teachers' ability to use a full range of digital learning tools contributes to students' engagement and achievement in the learning process [30]. Though, many factors may contribute to educators' decisions about whether to use technology when planning and teaching. Four distinct variables pertaining to physical educators, perceptions of relevance and importance of technology, teaching style, technology proficiency and context are consideration.

Theoretical framework designated shows that these four variables contributed to teachers' attitudes and usage of technology. Teachers' individual differences and their environments are considerations along with their attitudes and technology use characteristics. Identification of these provides valuable information for curricular modification, teacher training and professional expectations. [7] opined that as technology becomes increasingly available in schools, the necessity to examine usage, issues of quality and attitude are of greater importance. [17] states that the way teachers perceive relevance or importance of technology in curricula would predict the computer use.

Likewise, the value of technology demonstrated by other members would influences teachers' technology usage [1]. The influence on technology use involves both the structure of attitude and practice. The formation of attitudes can provide an understanding of teaches' decisions perceptions [19]. Hence, attitude may serve to explain decisions educators apply to teaching and how they prepare to teach with technology [22].

The use of Technology in physical Education teaching has the influence to enhance the real world experiences. Hence, it is professionally competence to create and intensify the use of technology in physical Education at the senior high schools to catch up with the trend towards a global knowledge-based society. Teachers' attitudes and experience are associated with computer use [5, 31]. Thus, factors that may influence their attitude may emanate from accepted precursors for effective use of technology, self-efficacy, social norms, training and external demands among others. The study investigate physical education teachers' attitudes towards technology integration into senior high school physical education teaching.

Research Questions

The following research questions were answered.

1. Do physical education teacher acquire any training requisite skills of technology into their professional practice in the school?
2. Do physical education teacher possess any of the technology?
3. What is the perception of physical education teachers' attitudes towards technology integration into physical education in senior high school?

Hypothesis

H_{01}: There is no significance correlation between physical education teachers' attitudes towards technology integration into physical education teaching in senior high school.

Materials and methods

Descriptive design method was employed in the study. Sixty respondents (male = 46; female = 14) using purposive sampling technique were selected from senior high school in Kumasi. A 26-items questionnaire of Physical Education Teachers' Attitudes and Technology Practice Questionnaire (PEATPQ) using previously published instruments [6, 16] clustered into four major factors including: a) physical educators' perception of relevance/importance of technology; b) physical educators' teaching styles/beliefs; c) physical educators' technology proficiency; and d) contextual factors on 5-points Likert scale ranging from strongly agree to strongly disagree was adapted and used for the attitude section of the instrument. Other include demographic questions, pre training and possession of any technology.

The instrument was administered after minor modification to test for the reliability scores and conceptual fit of items using Cronbach's alpha coefficient for each factor in the attitude section of the survey were physical educators' perceptions of relevance and importance of technology yielded (α=.68); physical educators' teaching style and beliefs yielded (α=.72); physical educators' technology proficiency and use yielded (α= .75) and contextual factors yielded (α=.70). The instrument overall total yielded a reliability coefficient of approximately α = .75. Three research questions were answered and one hypothesis tested at .05 significant level. The data collected were collated, coded and analysed using descriptive statistics and inferential statistics of Pearson Product Moment Correlation (PPMC) to test the hypothesis at .05 significant level.

Results and Discussion

Table 1: Descriptive statistic distribution by Sex

Sex	Frequency	%
Male	46	76.7%
Female	17	23.3%
Total	60	100

The above table 1 showed that male respondents were 76.7% more than the female respondents with 23.3% sampled. This

indicates that there are more male physical education teachers than the female in the senior high schools.

Table 2: Descriptive statistic distribution by Age

Age	Frequency	%
25-29	15	25.0
30-34	26	43.3
35-39	12	20.0
40-45	7	11.7
Total	60	100

The table 2 revealed that respondents between 30-34 ages had the highest percentage with 43.3%, followed by those between 25-29 with 25%, 35-39 with 20% and less those between 40-45 ages with 11.7%. This confirmed that most of the respondents were matured above the middle age and can use technology in teaching.

Table 3: Descriptive analysis distribution competent level

Competent Level	Frequency	%
High	21	35.0
Average	31	51.7
Low	8	13.3
Total	60	100

The results showed that most of the respondents have average competent level about the use of technology in the teaching of Physical Education. The findings revealed that respondents of average competent (51.7%) compared to respondents (35.0%) with high level and low level (13.3%) respectively.

Research Question 1: Do physical education teacher acquire any training requisite skills of technology into their professional practice in the school?

Table 4: Descriptive statistic of technology training in school

	Frequency	%
Yes	46	76.7%
No	14	23.3%
Total	60	100

The results from table 4 above reported majority 76.7% of the respondents have received form of training in the school to acquire the prerequisite skills as far as integrating technology into the professional practice, while 23.3% have no formal training to acquire the prerequisite skills as far as integrating technology into practice. Of those majority who had training, the highest responses to specific training received involved basic computer literacy and computer applications. Less than half of the respondent had training in advanced computer applications, and computer training for curricula integration.

Research Questions 2: Do physical education teacher possess any of the technology?

Table 5: Descriptive analysis technology possession

	Frequency	%
Yes	55	91.7
No	5	8.3
Total	60	100

The results above showed that over 91.7% of the respondents use and possess any form of technology for personal and professional work. This revealed that most of the respondents are familiar with and rely technology for their teaching resources.

Research Question 3: What is the perception of physical education teachers' attitudes towards technology integration into physical education in senior high school?

Table 6: Showing the Means and Standard Deviations of Attitude Items.

Factors	Items	N	Mean	SD
Perception of	Technology can enhance the quality of PE	60	4.23	.767
Importance/	I use a variety of learning methods for students in P.E	59	3.34	1.688
Relevance	Having more technology available would increase my use when teaching.	60	3.62	1.718
(POIR)	After learning something about technology, I Attempt to implement it.	60	3.57	1.430
	Technology training has been a positive experience for me.	60	3.97	1.365
Mean = 24.3	I would could consider technology when redesigning my Curriculum.	60	2.78	1.967
SD = 6.16	I make an effort to apply a variety of technology within my instruction.	60	2.73	1.821
Technology	I make an effort to apply a variety of technology in my teaching	60	3.05	1.741
Proficiency	I feel confident with my current ability to use technology for teaching.	60	3.07	1.736
(TPROF)	Most technology is frustrating to use for me without help	60	2.82	1.672
	Technology problems or troubles shooting makes me feel tensed	59	2.58	1.714
Mean = 14.83	Using technology to teach is enjoyable for me	60	3.33	1.791
SD = 4.16				
Contextual	I am expected to be knowledgeable in uses of technology	60	3.70	1.430
Factors	In my school, most teachers use technology when teaching	60	2.33	1.336
(CONFACT)	I have enough technology equipment appropriate my class size	60	2.03	1.426
	I can easily assess technology resource personnel in my school	60	1.75	1.663
Mean =13.38	My suggestion for staff development activities are valued by administrators	60	1.67	1.684
SD = 5.27	I know of many PE who use technology to teach	60	2.03	1.426
Teaching style	Technology takes time away from more important concepts	59	1.85	1.142
(TSTYLE)	Technology does not accommodate personal learning style	60	1.50	.983
	It's difficult using technology to teach PE	60	2.02	1.255
Mean =10.68	Behavior management affects my decision to use technology in PE	60	1.48	1.621
SD = 3.95	Technology use promotes student's motivation/participation in PE class	60	3.90	1.386

Table 6 above showed respondents' perceptions of physical education teachers on technology integration into physical education teaching. The findings shows that perception of importance/relevance had a higher mean (M = 24.3, SD = 6.16); technology proficiency with (M = 14.83, SD = 4.16); contextual factors (M = 13.38, SD = 5.27) and technology integration of teaching style had the lowest attitude factors of mean scores (M = 10.68, SD = 3.95), however, this still indicates that teachers generally responded positively to these items. Thus, technological gadgets enhanced the teaching and learning of physical education and improves teachers' knowledge and skills teaching of the subject.

Hypothesis Testing

HO: There is no significance correlation between physical education teachers' attitudes towards technology integration into physical education teaching in senior high schools.

Table 7: Showing the Pearson Product Movement Correlation of the Independent and dependent variables.

		POIR	TPROF	CONFACT	TSTYLE
POIR	Pearson Correlation	1	.316*	.224	.254*
	Sig. (2-tailed)		0.15	.088	0.52
	N	59	59	59	59
TPROF	Pearson Correlation	.316*	1	.116	.272*
	Sig. (2-tailed)	.015		.378	.035
	N	59	60	60	60
CONFACT	Pearson Correlation	.224	.116	1	.192
	Sig. (2-tailed)	.088	.378		.142
	N	59	60	60	60
TSTYLE	Pearson Correlation	.254	.272*	.192	1
	Sig. (2-tailed)	0.52	.035	.142	
	N	59	60	60	60

**correlation is significant at the 0.05 level (2-tailed)*

Table 7 examine the factors significant relationship using Pearson Product Moment correlations for attitude and use found between all of the factors. The r esults revealed that some relationships were stronger than the others. Thus, indicate that a strong relationship exists between teachers' perceptions of importance/relevance of technology and technology proficiency (r =.316, $p < .05$). The factors of teachers' perceptions of importance/relevance of technology and teaching style was also positively correlated (r =.254, $p<.05$). A positive correlation was found between technology proficiency and teaching style (r =.272, $p<.05$).

Discussion

The results of this investigation provide information about physical education teachers' attitudes towards technology integration into physical education teaching in senior high schools level in a classroom setting. The results shows that participants tended to be experienced physical educators' who frequently use computer and internet for general purposes because they possess it, and also majority of the participants have received some form of training in the school to acquire certain skills as far as integrating technology into their professional practice. This agrees with [13, 9] submit that attitude are associated with both teaching and experience, and years of computer experience. Thus, positive attitudes toward technology use are linked to the amount of experience in technology an individual attains [24]. This also is consistent with [29, 21], that in-service training and the use of the internet for instructional processes are related to teachers' confidence and feelings of being prepared to integrate technology in the classroom.

The results from this study indicate that participants who uses technology mostly based it on the importance/relevance with a higher mean value shown than others factors considered. This agrees with [5] who asserted that quality training encourages meaningful uses of technology. Also it consistent with [3] who affirmed that teachers' who have high computer skills tend to spend twice as much time working on computers in school as other teachers.

Overwhelmingly, participants acknowledged to use technology for teaching. This is support studies that shown perceived value and relevancy of technology use for instruction effects by teachers [3, 4, 26]. The results revealed positive relationship between the factors of technology use and teachers' attitudes about technology as correlations were found to be significant between these factors. Among the factors for attitudes and technology use, the strongest correlations were found between technology use and teacher' perception of importance/relevance of technology, and between technology proficiency and teachers' perception of importance/relevance of technology. It also agrees with [31] assertion that technology training positively tend to lead to technology use. Also, consistent with [15] believed that positive attitudes about the value of technology can be related to the amount of training participates in and increased use.

The results from this study indicate that technology proficiency and teaching style was also positively correlated. Thus, support [2] that the priority of technology within educational curricula depends on teachers' decision about the degree of applicability. [11] also opined that teachers' application of technology is effective when they are interested in the development of technology integration within the curricula.

Conclusion

Preparing educators to use different technologies is not the only element to support teachers' to integrate technologies in the classroom. The important point is the learning experience that students are expected to benefit should determine what tools to include in the design of the lesson. Although, the participants are confident about their skills and perceive technology use to be important, increased usage for teaching physical education is not likely unless if the limitations or rigid

curricula involved has solutions through strategic planning effort integrating technology may be complicated.

Recommendations

Based on the results of findings, the following recommendations are made:

1. The need to redirect the educational strategies and adopt new educational models to teach in order to integrate technology that links the main components that intervene in the educational process.
2. Preparing educators to effectively and efficiently incorporate technological features into the teaching and learning process.
3. Reviewing the Physical Education Curriculum to address the pedagogical uses of discipline specific technologies developing a digital environment appropriate for pre-training physical education teachers.

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