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ORIGINAL ARTICLE

TO IDENTIFY AND EXPLAIN THE BARRIERS TO APPLICATION OF INFORMATION TECHNOLOGY (IT) IN PHYSICAL EDUCATION COURSE IN SCHOOLS (CASE STUDY)

Abstract

The purpose of this research is to identify and explain the barriers to application of information technology (IT) in physical education course in schools of Iran- Zarand and to review the current status and determine its significance. The statistical population comprises of all 80 physical education teachers in Iran- Zarand and statistical sample is selected equal to statistical population. Data collection is done by researcher-made questionnaire whose face and content validity is confirmed by experts and its reliability is calculated by Cronbach's coefficient Alpha as 91%. For data analysis, Factor analysis together with Varimax Rotation, One Sample T–test and Friedman test are utilized. According Factor analysis 7 factors are identified and named Human, Facility-equipment, Technical, Cultural, Financial, Professional ability and Payment-fringe benefit factors. Review of current status shows that all said factors exist as barriers from among which human factor is known as the most important and payment and fringe benefit known as the least important barriers to application of IT in physical education course in Iran- Zarand. Prioritizing these factors may help the officials in physical education selection of Education and Training Organization in their planning issues to pay considerable attention to the application of IT..

Keywords: Information technology (IT), factor analysis, human barrier, salary payment-fringe benefit barrier

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INTRODUCTION

Click, click, and click. This is the sound of education in the twenty first century… there is a mouse in each student's hand (Lowenstein 2002). Nowadays in most of the developed countries, investment in education is in Information and communication Technology field. For technology is prevailing increasingly in all aspects of human life including working, leisure time, learning, health and etc (Razaghi etal.2013a, pp.33-41), (Razaghi etal.2013b, pp.30-37). What is more, Information and communication Technology is a significant tool for information processing. Therefore, in order to acquire required skills one needs to obtain necessary information from schools. Thus teaching technological tools at schools continues and its purpose is to get students acquainted with Information and communication Technology features and also make them think more deeply about it (Crum Packer, 2003).

Although since more than two thousand years ago up to now the process of teaching and learning has been subject to less changes compared with other areas, today with the help of information technology it has undergone drastic change (Jerry 2004). Research results show that information technology leads in more proper organization and management of educational settings (Visscher & wild 1997, pp.263-274) and subsequently in most countries implementing Information and communication Technology in educational system is paid due consideration in order to enhance the quality of teaching and learning methods (Pelgrum 2001, pp.163-167).

Technological infrastructures reported by America's national center for education statistics in 2005 describes that 94 percent of the school classes, workshops and libraries have simultaneous access to computer and internet while in 1994 this percent had been. The other noticeable point regarding technological infrastructures is that the ratio of computer to student in 1988 had been twelve to one. This report states the fact that 19percent of public schools in America had provided the opportunity to use pocket PCs with small size for their teachers and students. This percent was increased to 10 in 2002 and 19 in 2005. Even in hardware infrastructures 10 percent of American schools have lent laptop PCs to their students from 1 hour to a complete school day (Salehi etal. 2011, pp.23-36).

In the second international study of evaluating the application of Information and communication Technology in the section of educational sciences in education and training , Australia, Hong Kong and Finland showed in national policy that teacher training in

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Information and communication Technology field of the educational sciences needs regarding both pre-service and in-service periods and performing specialized courses of Information and communication Technology in educational sciences for teachers with an emphasis on their educational courses (Salehi etal. 2011, pp.23-36).

Pelgrum and Plomp (1993) found out that based on their researches, most teachers considered access to information technology and lack of technical support as the main impediments of using it. Pelgrum et al (1993) at sites-m project as the second study of information and communication technology in education also recognized insufficiency in number of computers, insufficiency of peripheral devices, insufficiency of software and insufficiency of technical support as main impediments to implementation of IT in schools.

Grinfelds (1999) stated often it occurs that IT literacy of some students is higher than their teachers' and some teachers consider this matter as challenging their traditional role of the most important knowledge source in classes. Lack of required English language competency was also known as an impediment to implementation of IT. Anyway, teacher's challenge in procedure of effective use of IT in teaching is something more than technical knowledge acquisition and this technical knowledge acquisition is the first impediment.

Valdes (2005) stated that impediments to implement technology in teaching and learning process in classrooms are resulted from insufficiency of teachers' knowledge, low quality of access to internet, lots of filtering in access to different websites and poor connection between homework and IT. Toprakci (2006) identified the impediments of integrating IT in schools according to the viewpoint of teachers and principals of elementary and secondary schools in Turkey: mundane impediments (material impediments), deficiency in providing technical services, deficiency in school staff training about IT, insufficiency in number of computers, old information or reduced speed of the procedure of information provision to IT systems and deficiency in learning software (pp.1-6).

Results of the research carried out by Baroo et al (2009) suggest that the performance of those students trained by computer is significantly better than that of those educated by traditional method (pp.52-74). Deryakulu et al (2010) also presented in their research results that there is a significant correlation between educational progress of students and teaching methodology by ICT (pp. 567-573).

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The results of research done by Elliot et al (2010) about comparing traditional teaching methodology with multimedia teaching methodology also suggested that the performance of the team being trained via multimedia was evaluated above average which was better than the performance of control group.

Studying several researches carried out shows that there are several impediments to the implementation of IT in physical education course. Therefore, this research intends to identify and explore these impediments. Thus the research is seeking for an answer to these questions:

1. What are the impediments of implementing Information Technology in physical education course in schools of Iran- Zarand?
2. How is the present situation of impediments to implementation of Information Technology in physical education course in schools of Iran- Zarand?
3. What is the order of importance of impediments to implementation of Information Technology in physical education course in Iran- Zarand?

MATERIALS and METHODS

This research is descriptive and applicable in purpose and the situation is field study. Statistical population comprised of all physical education teachers in education and training organization (Iran- Zarand) including 80 persons and sample was selected equal to statistical population. In this research for data collection library method was utilized. First, the theoretical principles of the subject were collected from library resources and then researcher-made questionnaire was employed to gather required data. After reviewing research literature, a 34-item questionnaire was prepared based on Likert scale in five levels (strongly disagree=1 to strongly agree=5). Afterwards in order to confirm the face and content validity of the questionnaire, the viewpoint of experts was applied. After validity confirmation, the questionnaire was exposed for reliability calculation. The questionnaire's reliability was also calculated by Cronbach's coefficient Alpha as 91% suggesting the internal consistency of tools. Data analysis method for collected data was performed using inferential statistics (including: factor analysis, one-sample t and Friedman rating) through SPSS software.

RESULTS

The first research question. What are the impediments of implementing Information Technology in physical education course in schools of Iran- Zarand?

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In order to investigate the first research question, factor analysis was applied. To perform factor analysis, (KMO) and bartlett's test need to be done to measure sampling adequacy and to ensure that correlation matrix in society is not zero. The results of the said test are presented in table1.

Table 1: (KMO) and Bartlett's test for facto analysis

(KMO) fitness test		0.568
Bartlett's test	Approximate Bartlett's K-squared	2519.708
	Degree of freedom	561
	significance level	0.000

As significance level in (KMO) is calculated less than 0.05 suggesting this test to be significance, factor analysis can be done and also sampling adequacy (KMO) measured as 0.568 is acceptable.

As it is shown in table 2, 69.879 variance percentage is evaluated through 7 factors. Based on factor analysis with Varimax rotation and omission of variables with a factor loading less than 0.5, from 34 impediments under this study, 4 impediments for the factor loading less than 0.5 were omitted and 30 remained factors were set to 7 main factors or impediments. After coming to a proper factor structure, in order to name factors based on rotated correlation matrix, the questions related to each factor together with their weights are presented in table3.

Table 2: Variance percent in factor analysis for factor classification (summarized table)

FACTOR	Extraction sums of squared loading			Rotation sums of squared loading		
	Total sum	Variance Percentage	Cumulative percentage	Total sum	Variance Percentage	Cumulative percentage
1	11.526	33.899	33.899	7.423	21.832	21.832
2	3.460	10.176	44.074	4.526	13.311	35.144
3	2.687	7.903	51.977	3.045	8.955	44.099
4	2.245	6.604	58.581	2.266	7.252	51.351
5	2.028	5.966	64.547	2.258	6.462	57.994
6	1.486	4.371	68.918	2.126	6.252	64.246
7	1.421	4.178	73.096	1.915	5.633	69.879

According to literature review and present research results, main impediments to the implementation of Information Technology in physical education course in schools of Iran-

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Zarand are: human, facility/equipment, technical, cultural, professional ability, salary and fringe benefit payment and financial factors.

Table 3: Existing factors and components of each factor with factor weight

Factor indices	factors						
	1	**2**	**3**	**4**	**5**	**6**	**7**
Factor1. Human							
• Lack of self-confidence in teachers of physical education course	0.717						
• Traditional attitude of physical education teachers towards teaching	0.677						
• Low level of teacher's knowledge in IT advantages	0.746						
• Absence of a developed attitude in supervising the use of existing systems	0.597						
• Absence of a proper culture about how to preserve purchased systems	0.813						
• lack of a positive attitude towards IT amongst physical education teachers	0.666						
• Absence of a deep and well-developed attitude to development of IT in physical education course	0.591						
• Teachers' insufficient skills in IT in physical education course	0.828						
• Teachers' insufficient knowledge in IT in physical education course	0.815						
• Lack of proper knowledge in advantages of implementation of IT in Teachers' insufficient skills in physical education course	0.797						
• Useless and impractical ICDL skills trainings to teachers	0.714						
• Relative poverty of specialized human resources of physical education in designing information and communication technology	0.521						
Factor2. Facility-equipment							
• Poor communication and restriction in school facilities		0.805					
• insufficient computer numbers and technical-specialized equipments in physical education course		0.779					
• Inappropriate physical condition of computer workshops		0.745					
• Not having a personal computer for each physical education teacher		0.677					
• Lack of computer workshop and computer technical equipments of physical education in schools		0.612					
• deficiency of learning software in physical education course		0.521					
• Deficiency of technical service provision		0.586					
Factor3. Technical							
• Low quality, malfunction and out datedness in computers and other technical services in physical education course			0.690				
• Not having sport classes equipped with multimedia apparatus			0.576				
• Absence of websites and weblogs to introduce school tasks, performance and experience about physical education			0.721				

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Factor4. Cultural

- Family's rigidity and binding to customs and traditions   0.766
- Lots of filtering in internet   0.852
- Not believing on advantages and services of IT in physical education from families side   0.569

Factor5. Professional ability

- Physical education teachers' inability to make electronic contents   0.683
- Unfamiliarity of principals and teachers with English language   0.797

Factor6. Financial

- Expensive technology equipments in physical education course   0.514
- Limitation in using internet by physical education teachers   0.853

Factor7. Payment- fringe benefits

- Implementation of IT not affecting payment and fringe benefits of principals and teachers of physical education   0.843

Second research question. How is the present situation of impediments to implementation of Information Technology in physical education course in schools of Iran-Zarand?

In order to find the answer to this question, one-sample T test is applied and the results are presented in table 4.

Table 4: Descriptive results and one-sample T test results for 7 impediments

	Confidence interval=95%			Test cut score=3				
Factor	**Number**	**Average**	**Standard deviation**	**Average standard error**	**t**	**df**	**Significant level**	**Different of averages**
Human	79	4.11	8.43	0.94	4.28	78	0.000	3.11
Facility- equipment	78	4.36	5.00	0.56	4.19	77	0.000	3.09
Cultural	80	3.84	1.87	0.20	4.15	79	0.000	2.88
Technical	80	3.84	1.87	0.20	4.15	79	0.000	2.86
Financial	78	3.80	1.22	0.13	4.11	77	0.000	1.95
Payment- fringe benefit	80	3.37	0.99	0.11	3.27	79	0.001	1.90
Professional ability	80	3.13	1.41	0.15	2.16	79	0.000	1.80

Based on one-sample T test results, it was concluded that there was a significant difference between average obtained from the present situation and theoretical average (3). This was regarding the fact that in all cases obtained average was more than 3 (cut score) proving that all these cases are now impediments to implementation of IT physical education course in schools of Iran- Zarand.

Third research question. What is the order of importance of impediments to implementation of Information Technology in physical education course in Iran- Zarand?

In order to find the answer to this question, Friedman rating test is applied and the results are shown in table5.

Table 5: The results of rating of impediments to implementation of IT (Friedman test)

Factor	Human	Facility-equipment	Cultural	Technical	Financial	Payment-fringe benefit	Professional ability
Average	4.87	4.80	4.45	4.43	2.75	2.24	1.19
Rate	1	2	3	4	5	6	7

The results of table 5 shows that human factor is the most important source and payment-fringe benefit is the least important factor among impediments to implementation of IT in physical education course in schools of Iran- Zarand.

DISCUSSION and CONCLUSION

With the increasing progression of sport and the importance of low levels of education, information technology can be known as the missing ring of a chain between schools especially in physical education course. Information and communication technologies have been the touchstone of change and evolution in the last decade. Not only information technology has create new opportunities, but also it has caused changes in many other careers as well; still many believe that automation has made considerable amount of redundancy. But does information technology bring upon new opportunities or more redundancy? Is information technology trend and its impact on opportunities in different nationalities something which can be traced or is it that individuals are carried on the wave towards an ambiguous destination in the middle of nowhere? And how this matter effect on learning in physical education? Based on data analysis of the present research results, the major impediments to implementation of IT are identified and classified in 7 factors including human, facility-equipment, technical, cultural, financial, professional ability and payment-fringe benefit impediments. The present research results are compatible with Toprakci (2006) and Valdes (2005) researches. Deryakulu et al (2010) also presented in their research results that there is a significant correlation between educational progress of students and teaching methodology by ICT. Baroo et al (2009) suggest that the performance of those students

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trained by computer is significantly better than that of those educated by traditional method. Indeed, all of the researcher in IT field trying to say this matter important, sport and physical education such as sport in school need more than other industry to combine IT and fine gap and try to coverage. Nowadays according to the development of IT in school affairs, speed is considerably increased and unfortunately physical education course is deprived of this opportunity. The present research results showed that mundane and worldly matters couldn't be the only solution for implementing IT in schools but human resource or let's say promotion of human resource using technological tools like education and development of ICDL skills and proper incentive factors can improve this trend. One can't learn cycling without a bicycle, thus, after human resource, appropriate equipments may affect technology procedure. This result is compatible with Salehi (2011) research results investigating technological tools in 2 developed countries including America, Hong Kong, Finland and Australia. However, the role of culture, financial affairs and staff professional ability can't be disregarded and the establishment of IT in schools may be conditioned by all these factors. Nevertheless, this research show that prioritizing technological issues may lead in sooner IT establishment which requires planning and more care.

Considering the present research results, propositions are provided as follows:

1. To hold in-service IT-based classes in physical education course and clarify its position in development and promotion of students' quality level.

2. To create technological knowledge transfer function through network content.

3. To provide material and moral support from teachers who present electronic content.

4. To purchase and update physical education course equipments.

5. To encourage physical education teachers for leaving traditional approaches and to accompany them for performing new and modern approaches.

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