Teachers' Perception for Adoption of Instructional Technology in Schools

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Abstract

This study was conducted as a project requirement for postgraduate general education elective course MPS 1163: Epistemological, Social and Ethical Issues in Science and Technology. The study was aimed at investigating teachers' perceptions for adoption of instructional technology in school and the use of technology in teaching and learning. Four aspects were studied; teachers 'attitudes toward the use of technology in the classroom, teachers' motivation to use technology in teaching, teachers ' perception of barriers and challenges to the use of instructional technology and their perceptions on technology professional development needs. A purposive sample consisting of 25 teachers were randomly selected from secondary schools around Johor Bahru. This research used a questionnaire survey to the teachers. The findings showed that most teachers are having a very positive attitudes and motivation to use instructional technology into classroom; as well as to overcome barriers and challenges of adopting the instructional technology. Furthermore, the findings also indicated that teachers agreed that the school give a high priority for improving teachers' ICT skills via various professional development programs.

Keywords: Instructional Strategy, ICT's Adoption, Teaching and Learning, Teacher's Motivation, Instructional Technology, Technology Professional Development.

INTRODUCTION

This paper represents part of the report of the mini research project on investigation of teachers' perceptions for adoption of instructional technology in school and the use of technology in teaching and learning as a requirement to complete MPS 1163 (Epistemological, Social and Ethical Issues in Science & Technology) course. This research used a questionnaire survey. In this study, the factors selected for investigation are based on literature (Graham, et al., 2004; Graves 2004; Palak, 2005; Rogers, 2000; Tallman & Fitzgerald, 2005; Topper, 2004). There are four factors that might influence the teachers' perception for adoption of instructional technology in schools. The first factor is teachers' attitudes towards technology integration into classroom. The second factor is teachers' motivation for adoption of instructional technology. The third factor is teachers' perceptions of barriers and challenges to adoption of instructional technology and the final factor is teachers' perceptions of their technology professional development needs towards the adoption and use of technology innovations in school.

In the past 25 years, Ministry of Education, Malaysia (MOE) aims at establishing a platform that enables educators and individuals to be interested in educational technology, to exchange ideas and collaborate efforts towards promoting the usage and application of various aspects of educational technology at every level in the educational system, from pre-school to higher education. A review of the literature on barriers to instructors' adoption found conflicting results, in which some issues present more pertinent barriers than others. In the way of implementation of the instructional technology in school, teachers face barriers and challenges.

PURPOSE OF THE STUDY

In this research, focus will be on the frequencies of technology use for teaching and learning in school and to seek the favorable perception of teachers for adoption of instructional technology in school related to the factors mentioned earlier. The study will benefit teachers personally by reflecting on their use of instructional technology in the classroom and by considering options they may not have previously considered such as their motivation, barriers and challenges and professional development needs for adoption of instructional technology. The findings of this study could also serve as a contribution for planning future studies on technology integration in Malaysian schools and teacher education institutions.

METHODOLOGY

Research design used in this study is a survey research. In this research, instrument used was constructed on readily available data and improved data. The data collected were analyzed using SPSS for Windows Version 16. (Statistical Package for Social Sciences). A total 25 teachers from various schools in Johor Bahru were involved in

this study. All the teachers are the post graduate students at Faculty of Education, University Technology of Malaysia and all the participants teaching in Science and Mathematics subject.

In this study, the questionnaire used was divided into 3 parts, Demographic Information, Part A and Part B. The questionnaire was based on literature (Graham, Culatta, & Pratt, 2004; Graves 2004; Palak, 2005; Rogers, 2000; Tallman & Fitzgerald, 2005; Topper, 2004) and was modified to suit the purpose of the research. The first part containing items that ask participants' demographic information, second part which is Part A will ask questions about technology use for teaching and learning. There were 7 items in this part. Part B surveyed about teacher's attitudes towards technology. This part consists of four factors consisting 31 items designed to elicit teacher's attitude towards technology integration into classroom, teacher's motivation for adoption of instructional technology, teacher's perception of barriers and challenges to adoption of instructional technology and teacher's perception of their professional development needs. The scale used to categorize the factors will follow the following scale.

scale	level
1.0 – 2.3	low
2.4 – 3.7	moderate
3.8 – 5.0	high

RESULT AND DISCUSSION

In this section, discussion will be on the 3 parts in the questionnaire. Demographic Section, Part A and B. The results from the items in part A and part B are to answer the research questions. For Research Question, the descriptive statistical procedure was used to assess the percentage or frequency of technology use for teaching and learning in school and the favorable perception of teachers for adoption of instructional technology in school according to the four factors.

Demographic Information.

Table 1 shows the majority of the respondents were female with the frequency 18 (72.0%) compared to male (28.0%) with the frequency 7.

Table 1: Frequency of Respondents According to Gender

Gender	Frequency	Percentage %
Male	7	28.0
Female	18	72.0

Table 2 shows that majority of respondents were age 25 to 29 with the percentage 72.0%. Follow by age 30 to 34 with the frequency 4, 20 to 24 with the frequency 2 and only one respondent age 35 to 39.

Table 2: Frequency of Respondents According to Age

Age	Frequency	Percentage %
20 – 24	2	8.0
25 – 29	18	72.0
30 – 34	4	16.0
35 – 39	1	4.0

Table 3 shows that majority of respondents having 3 to 5 years teaching experience (48.0%) with the frequency 12 compared to the second highest frequency 6 to 8 years of teaching experiences. Thus 76.0% of respondents had between (3-8 years) teaching experiences.

Table 3: Frequency of Respondents According to Teaching Experience

Teaching Experience	Frequency	Percentage %
0 – 2	4	16.0
3 – 5	12	48.0
6 – 8	7	28.0
9 – 11	1	4.0
12 – 14	1	4.0

Analysis for Part A: Technology use for Teaching and Learning

Table 4 and 5 shows the results of the analysis of the data. As indicated in Table 4, the usage of instructional technology in school was high according to the mean for all the items. For item 1, 92.0% of the respondents either frequently or always use computer-based technology (CBT) for personal communication, document preparation, email and word processing. Similarly, 76.0% either frequently or always used CBT for classroom management and students, assessment while 72.0% respondents either frequently or always use computer-based technology in instruction in classroom teaching and learning respectively.

Table 4: Percentages, Means and Standard Deviations for item 1, 2 and 3

a) How often do you use computer-based technology in the following areas?

Item	N	R	S	F	AA	Mean	STD
1. Personal communication and document preparation, i.e. email and word processing	8%	0%	0%	24%	68%	4.44	1.12
2. Classroom management and student assessment/evaluation purposes	0%	0%	24%	44%	32%	4.08	0.76
3. Teaching and learning activities for your students	8%	0%	20%	44%	28%	3.84	1.11

N= Never R=Rarely S=Seldom F=Frequent AA=Always

From Table 5, 88% of the respondents either frequently or always used CBT for word processing and instruction. Only 68% of the respondents either frequently or always used software Microsoft Excel or access for instruction and 72% either frequently or always used Microsoft power point for class presentation.

As expected fairly high (88%) number of respondents used Internet/E-Mail for instruction.

Table 5: Percentages, Means and Standard Deviations for item 4, 5, 6 and 7

b) How often do you use the following application software for instruction?

Item	N	R	S	F	AA	Mean	STD
4. Microsoft Word for word-processing and instruction.	0%	12%	0%	24%	64%	4.40	1.00
5. Microsoft Excel/Access for instruction.	0%	12%	20%	12%	56%	4.12	1.13
6. Microsoft PowerPoint for presentation in class	0%	4%	24%	20%	52%	4.20	0.96
7. Internet/E-Mail for instruction.	0%	12%	0%	40%	48%	4.24	0.97

Result and Analysis for Part B: Teacher's Attitudes towards Technology Integration Survey

Table 6, 7, 8 and 9 discuss the respondents' perception on the four factors being studied. The quantitative analysis used modes, mean and standard deviation as the statistical procedure.

Factor 1 (Teacher's Attitudes towards Technology Integration into Classroom)

According to Table 6, generally respondents had positive attitudes towards instructional technology into classroom. However the responses are quite varied in nature and requires explanation. For item 1 92.0% of the respondents either agree or strongly agree that integration of computer is not the only means for effective classroom teaching while 8.0% of the respondents remains neutral. For item 2, 44.0% either agree or disagree that integration of technology into the class results in only minor improvement in learning over traditional methods which is in complement with the responses in item 1. Since 24.0% respondents still believe that computer integration gives more than just minor improvement. For item 3 82.0% of the respondents believe that teachers have the competency to use instructional technology while 8.0% remain neutral. Item 4 indicates that 48.0% respondents will feel discouraged if they do not have the ability skills on technology integration. This shows that, most of teachers believe and willing to use computer as their learning aids. Only 44.0% respondents felt discouraged if they do know how to integrate computers into instruction while 36.0% stated that they unsure how to integrate computers into instruction. The remaining of the respondents felt neutral about this item. The mean of these 8 items shows that teachers have a high attitude towards technology integration into classroom. From the scale, mean of 3.7 indicate that the attitude towards technology integration is moderate.

Table 6: Frequencies, Means and Standard Deviations for Factor 1

Item	SD	D	N	A	SA	Mean	STD
1. Anything that a computer can be used for, I can do just as well some other way.	0	0	2 (8.0%)	14 (56.0%)	9 (36.0%)	4.28	0.61

2. The integration of technology into the class results in only minor improvement in learning over the traditional methods.	6 (24.0%)	0	8 (32.0)	10 (40.0%)	1 (4.0%)	3.24	0.88
3. I believe that all teachers should know how to use instructional technology.	0	0	2 (8.0%)	10 (40.0%)	13 (42.0%)	4.44	0.65
4. My inability to manage all that technology integration in the classroom requires of me discourages me.	1 (4.0%)	7 (28.0%)	5 (20.0%)	9 (36.0%)	3 (12.0%)	3.24	1.13
5. It is important that my school's ICT plan includes the use of instructional technology.	0	0	2 (8.0%)	17 (68.0%)	6 (24.0%)	4.16	0.55
6. I am unsure how to integrate computers into instruction.	11 (44.0%)	0	5 (20.0%)	9 (36.0%)	0	2.92	0.91
7. I am working hard on using instructional technology to maximize the effects on my teaching and students' learning.	2 (8.0%)	0	7 (28%)	14 (28.0%)	2 (8.0%)	3.56	0.96
8. I believe technology integration into the curriculum enriches the teaching and learning	0	0	2 (8.0%)	10 (40.0%)	13 (52.0%)	4.44	0.65
Total						3.71	0.27

SD=Strongly Disagree **D=Disagree** **N=Neutral** **A=Agree** **SA=Strongly Agree**

Factor 2 (Teacher's Motivation for Adoption of Instructional Technology)

91 % of respondent agree that they enjoy preparing class activities that integrate instructional technology while only 20% felt uncomfortable with the use of computer tolls for instruction. A dominant of 96% teachers agree that technology is a useful tool in their instruction. This is the most dominant statistics recorded in this study. Only 4% teacher was neutral and there was no number of opposed the opinion with mean 4.32 and STD 0.56. 76.0% respondents agreed that computers give them more opportunities to learn many new things while 88.0% respondents agreed that it is important for the school to recognize teachers for integrating computers for teaching. Teachers need support to increase their motivation in integrating computers for teaching. The mean for item 10, 12 and 14 proved that teachers have a positive motivation to adopt technology in instruction. Based on the average mean, teachers have moderate motivation for adoption of instructional technology. From the scale, mean of 2.6 indicate that the motivation towards instructional technology is moderate.

Table 7: Frequencies, Means and Standard Deviations for Factor 2

Item	SD	D	N	A	SA	Mean	STD
9. I enjoy preparing class activities that integrate instructional technology.	0	2 (8%)	4 (16%)	15 (75%)	4 (16%)	3.84	0.80
10. I feel uncomfortable with the use of computer tools for instruction.	3 (12%)	9 (36%)	8 (32%)	3 (12%)	2 (8%)	2.68	1.11
11. I know that computers give me more opportunities to learn many new things.	0	4 (16%)	2 (8%)	8 (32%)	11 (44%)	4.04	1.10
12. I get a sinking feeling when I think of trying to use a computer in my instruction.	2 (8%)	8 (32%)	10 (40%)	5 (20%)	0	2.72	0.89
13. I believe technology is a useful tool in my instruction.	0	0	1 (4%)	15 (60%)	9 (36%)	4.32	0.56
14. I have avoided the use of instructional technology because computers are unfamiliar to me.	3 (12%)	13 (52%)	5 (20%)	2 (8%)	2 (8%)	2.48	1.08
15. It is important that the school reward structure should recognize teachers for integrating computers for teaching.	0	1 (4%)	2 (8%)	18 (72%)	4 (16%)	4.00	0.65
Total						2.60	0.29

SD=Strongly Disagree **D=Disagree** **N=Neutral** **A=Agree** **SA=Strongly Agree**

Factor 3 (Teacher's Perceptions of Barriers and Challenges to Adoption of Instructional Technology)

The highest mean for the item in Factor 3 is "I own a computer for personal and home use". The result shows that, 92.0% respondents agree with the statement. In line of that, most of the respondents have their own computer for personal and home use. 64.0% respondents agreed with the item "There are too few training opportunities for teachers to acquire new computer knowledge/skills for teaching". It shows that, teachers need training to acquire new computer knowledge and skills for teaching. One of the barrier in adoption of instructional technology in school is limited expertise in computer skills which 52.0% respondents agreed with the statement. The average mean for factor 3 was 2.94. From the scale, mean of 2.9 indicate that the perception of barriers and challenges towards technology integration is moderate.

Table 8: Frequencies, Means and Standard Deviations for Factor 3

Item	SD	D	N	A	SA	Mean	STD
16. I have a convenient access to instructional technology at school.	2 (8%)	3 (12%)	2 (8%)	10 (40%)	8 (32%)	3.76	1.27
17. Using technology for instruction is too expensive for Malaysian school.	0	3 (12%)	10 (40%)	8 (32%)	4 (16%)	3.52	0.92
18. I feel already over-burdened without adding technology professional development workshops.	2 (8%)	2 (8%)	19 (76%)	2 (8%)	0	2.84	0.69
19. There are too few training opportunities for teachers to acquire new computer knowledge/skills for teaching.	0	1 (4%)	8 (32%)	13 (52%)	3 (12%)	3.72	0.74
20. I own a computer for personal and home use.	0	0	2 (8%)	6 (24%)	17 (68%)	4.6	0.65
21. I don't have access to a computer at home with software installed for use in my teaching preparation.	8 (32%)	12 (48%)	3 (12%)	2 (8%)	0	1.96	0.89
22. I have insufficient time to develop instructional materials that use computers.	2 (8%)	9 (36%)	11 (44%)	3 (12%)	0	2.60	0.82
23. My limited expertise in computer skills prevents me from using instructional technology.	2 (8%)	9 (36%)	1 (4%)	11 (44%)	2 (8%)	3.08	1.22
Total						2.94	0.34

SD=Strongly Disagree D=Disagree N=Neutral A=Agree SA=Strongly Agree

Factor 4 (Teacher's Perceptions of their Technology Professional Development Needs)

Based on the Table 9, 5 items in Factor 4 have mean more or equal to 4.00. It shows that respondents agreed that they need more reliable access to the Internet, more software that is subject/curricular-based, need more resources that illustrate how to integrate technology into the curriculum, more training opportunities with teaching strategies that integrate technology, and they need to attend technology workshops and seminars to start using instructional technology. 72% agreed that they need immediate training with curriculum that integrates technology while a dominant of 92% teachers need more software that is subject/curricular based. F In this section, they result shows that most of the teachers involved in this research need to develop their skills in instructional technology. For item 24, 100% respondent agreed with the statement and for item number 31, 80% of the respondent agreed that they need to attend technology seminars or workshops to start using instructional technology. By evaluating the average mean, respondent have a high perception on their technology professional development needs. From the scale, mean of 3.9 indicate that the perception of technology professional development needs towards technology integration is high.

Table 9: Frequencies, Means and Standard Deviations for Factor 4

Item	SD	D	N	A	SA	Mean	STD
24. I have an immediate need for more training with curriculum that integrates technology.	0	0	7 (28%)	16 (64%)	2 (8%)	3.80	0.58
25. I need convenient access to more computers for my students.	0	0	6 (24%)	14 (56%)	5 (20%)	3.96	0.68
26. I need more reliable access to the Internet.	0	0	5 (20%)	14 (56%)	6 (24%)	4.04	0.68
27. I need more software that is subject/curricular-based.	0	0	2 (8%)	14 (56%)	9 (36%)	4.28	0.61

28. I need more resources that illustrate how to integrate technology into the curriculum.	0	0	0	19 (76%)	6 (24%)	4.24	0.44
29. I need more training opportunities with teaching strategies that integrate technology.	0	0	3 (12%)	17 (68%)	5 (20%)	4.08	0.57
30. I need more time to change the curriculum to incorporate technology.	1 (4%)	0	7 (28%)	10 (40%)	7 (28%)	3.92	0.86
31. Attending a few technology workshops and seminars is enough for me to start using instructional technology.	2 (8%)	0	3 (12%)	13 (52%)	7 (28%)	4.00	0.87
Total						3.93	0.45

SD=Strongly Disagree **D=Disagree** **N=Neutral** **A=Agree** **SA=Strongly Agree**

DISCUSSIONS AND RESEARCH FINDINGS

What is the percentages of technology use for teaching and learning in school?

From the descriptive analysis, all the 7 items in Part A score more than 60% of usage. This part investigate about the usage of technology in teaching and learning in school. Item 1 score 92% usage, item 2 score 76% usage while 72% respondents stated they used technology in item number 3. In application software usage for teaching and learning, Microsoft Word, Internet and E-mail used for instruction score 88%, 68% respondents used Microsoft Excel and 72% used Microsoft Power Point for instruction. This finding shows that teachers use technology in teaching and learning.

What is the favourable perception of teachers for adoption of instructional technology in school according to the following factors:

Factor 1: Teacher's Attitudes towards Technology Integration into Classroom

Respondents believe that all teachers should know how to use instructional technology and they agreed that technology enriches teaching and learning Respondents also agreed that school's ICT plan should include the use of instructional technology. This findings shows that the awareness of teachers in the use of technology in teaching and learning is high and most of the respondents have positive attitudes towards technology integration into classroom.

Factor 2: Teacher's Motivation for Adoption of Technology

"I believe technology is a useful tool in my instruction." was the favorable item for Factor 2. Respondents also agreed that computers give them more opportunities to learn many new things. The level of motivation of the teachers was high because according to the mean of the negative statement, all of the items score mean below than 3 (respondents disagreed with the statement).

Factor 3: Teacher Perceptions of Barriers and Challenges to Adoption of Instructional Technology.

From the findings, respondents agreed that there were too few training opportunities for teachers to acquire new computer knowledge/skills for teaching in school. This was the main barrier and challenges they need to face in adoption of instructional technology. The ministry of education should plan training for teachers in computer knowledge or skills for teaching in school. The investigation also found that most of the respondents have their own computers.

Factor 4: Teacher Perceptions of their Technology Professional Development Needs

From the results, researcher can conclude that teachers needs to attend course or seminars in technology to help them build their skills and improve their teaching and learning method. Most of the respondents agreed with all the statement for Factor 4.

CONCLUSION

As a conclusion, form the findings in Part A every questions had a very good response with all 25 participants answered them accordingly. The average mean in Part A is 4.19 with standard deviation 1.01. This statistics showed us that, teachers were well used the technology in their work place as well as in their instruction in the classroom. In the other hand, for Part B the findings showed that most teachers are having a very positive attitudes and motivation to use instructional technology into classroom; as well as to overcome barriers and challenges of adopting the

instructional technology. Furthermore, statistics showed that teachers agreed if the school give a good priority for improving teachers' ICT skills via various professional development programs.

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