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RESEARCH ARTICLE

DEVELOPING A TECHNOLOGY ACCEPTANCE MODEL IN AN ONLINE DISTANCE LEARNING ENVIRONMENT FOR SECONDARY SCHOOL TEACHERS IN MALAYSIA.

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Abstract

This paper discusses outcome of developing a Technology Acceptance Model, using the secondary schools teachers, in the district of Perak, Malaysia using a web-tool intervention. The findings discussed in this paper are part of the larger study, which was based on the quantitative and qualitative analysis conducted in the nine districts of Perak. While 216 secondary schools were targeted for quantitative analysis, 10 teachers in two districts of Perak were observed using Web tools. Findings reveal that although majority of the teachers were enthusiastic about infusing technology teaching using Web-tools, majority of them were only able to progress only to the utilization phase and not as mentioned until the integration phase as mentioned by Hooper and Rieber framework. This research also provided an insight for developing a technology acceptance model for secondary school teachers in a blended learning environment.

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Introduction:-

Various agencies within Ministry of Education conduct training for secondary school teachers to use Computers in their classroom teaching. One of the famous projects for the Secondary School teachers in Malaysia to impart technology teaching is the Smart School Project, in which an expected 450,000 teachers are expected to be trained before 2010.

Although billions of dollars have been invested in this area to integrate ICT with education, what seems to be more important is to see if the teacher's actually gain sufficient Technological Pedagogical Content Knowledge in a Web based environment. Thus there is certainly a need to find if such projects to impart ICT into education and to prepare today's teachers for tomorrow's demand really are beneficial to the pedagogical community, in Malaysia context.

Research Methodology:-

Methodology used in this study to collect data employed both qualitative and quantitative data collection procedures. The respondents for the first phase answered the survey questionnaire. A total of 648 of them teaching form 3 and form 4 in the Perak school districts were involved in this study. After the completion of the quantitative analysis, the qualitative analysis included ten teachers from two school districts of Perak, which included five teachers each from rural and urban schools.

Analysis Of The Results:-

From the Questionnaires administered to 648 teachers, completed questionnaires were received from 191 schools from 554 teachers, which was 88 percent of all teachers given the questionnaires. The questionnaires were targeted on teachers who handle English, Maths and Science at form 3 and form 4 levels of secondary schools. The sample was 32.3 percent English teachers (N=179), 33 percent Maths teachers (N=183) and 34.7 percent Science teachers (N=192). Descriptive and inferential statistics were used to analyse the quantitative data. The Statistical Package for Social Sciences (SPSS) Version 11.5 software was used to analyse the data for this study.

From the population used for quantitative analysis, 10 teachers were selected based on action research method. Action research method was used because it is defined as systematic, self-reflective inquiry aimed at constructing knowledge about one’s practice with the major goals of improving and coming to better understanding of the practice (Carr & Kemmis, 1986; Cochran-Smith & Lytle, 1993; Stenhouse, 1975).

Discussion And Findings:-

1. Technology integration is a complex phenomenon that involves understanding teachers' motivations, perceptions, and beliefs about learning and technology.
2. Pierson (1999) defined technology integration as teachers utilizing content and technological and pedagogical expertise effectively for the benefit of student’s learning.

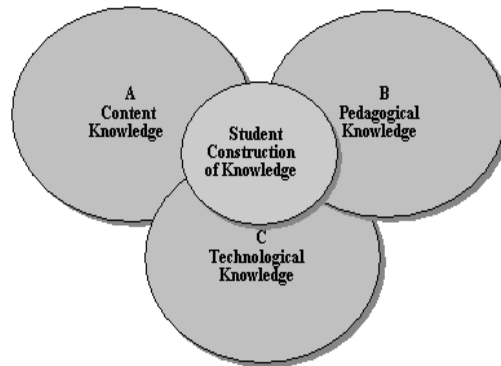


Figure 1.1:-Pierson's model of technology integration (Modified by Woodbridge, 2004).
 (Source: <http://www.etc.net/tech/resources/integration.htm>)

He found three important components common to construction of knowledge: (a) Content knowledge; (b) pedagogical knowledge; and (c) technological knowledge. Following in line with these statements, there has been a wide spectrum of analysis that had taken these three elements namely learner, teacher and material in the past decade that finally converged in the recent past with the integration of technology with PCK as technological pedagogical content knowledge (TPCK). This TPCK is an emergent form of knowledge that goes beyond all three components namely content, pedagogy and technology (Mishra & Koehler, 2006).

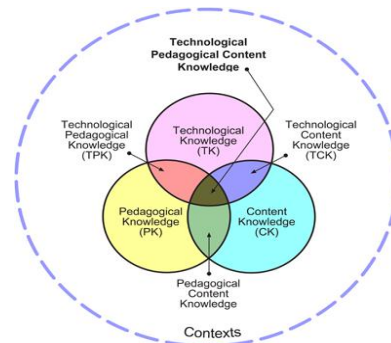


Figure 1.2:-The components of technological pedagogical content knowledge
 Source: by Koehler & Mishra (2006)

Technological Pedagogical Content Knowledge, attempts to capture some of the essential qualities of knowledge required by teachers for technology integration in their teaching. At the heart of the TPCK framework, is the complex interplay of three primary forms of knowledge: Content (CK), Pedagogy (PK), & Technology (TK) and their intersections with each other. Considering the intersection we have PCK, TCK, TPK and TPCK. The Idea of PCK is consistent with and similar to Shulman's idea of knowledge of pedagogy that is applicable to the teaching of specific content. TCK is knowledge about the manner in which technology and content are reciprocally related. This is where teachers need to know not just the subject matter they teach but also the manner in which the subject matter can be changed by the application of technology (Mishra & Koehler, 2006). On the other hand, TPK is knowledge of the existence, components, and capabilities of various technologies as they are used in teaching and learning settings, and conversely, knowing how teaching might change as the result of using particular technologies. This includes knowledge of tools maintaining class records, attendance, and grading, and knowledge of generic technology-based idea such as WebQuests, discussion boards, and chat rooms. Finally TPCK is a form of knowledge that expert teachers bring into play anytime while integrating technology with PCK.

From the teachers' observations carried out with the 10 teachers, the dialogues taken from the interviews of these three teachers, gives an opportunity to understand the teachers' attitude in a precise manner while using Web tools.

Vel:

I think I did find many difficulties. If I do it continuously I think it would not be a problem as a part of my job. I have really not tested it so it was only during the observation I have tested.

Loh:

I think there is no difficulty but I think I have to spend more time in working with the Web-tools.

Padhma:

but.. When it comes to lesson plan and linking it to website was bit difficult. From the statement of Vel, it is clear he has not used the Web-tools in the classroom, as he mentions that he has used them only during his observation sessions with me. Also it is clear from his statement that he does not use them continuously as a part of his job. Similarly, Loh mentions that she has not spent much time using Web-tools. Thus there seems to be a lack in technology integration of Web-tools or a desire to use them continuously in their classroom. In the case of Padhma, she was able to post messages with ease using the Web-tools but she found posting lesson plans to be bit difficult. This is an interesting point to note, as posting messages and uploading lesson plan had identical user interface and same the strategies, but still she mentions that uploading lesson plans was a bit difficult. This shows that she had not shown the same desire as she had during her first observation, as she moved to the next stage of her observations.

The rest of the seven participants were accepting in their use of Web-tools and used it as an integral part of their teaching in terms of delivery, learning, management, or other aspects of the class.

The dialogues of the seven teachers taken from their interviews respectively give us an indication about the level of pedagogical belief the teachers had in using the Web- tools.

Gouri:

I think it is manageable with user manual... I have gone through the Web-tools. I have tried it at home... so simple I can manage it without any guidance.

Azila:

The Web-tools is very useful to me, it is easy to contact my student and also I can give them homework and also upload my notes and also it is very useful.

K.Kumar: Yeah of course it is a very simple method for me and it should be adopted in all the schools.

Khalijah:

Yes, exactly, I always give them (students) the examples of website which is related to mathematics so I think if you have internet at home and so on, it would be useful to practice questions and other schools question bank.

Lau:

I think it is a very good idea... I think when we have the facility and all and I have time then I would like to use it [113UD]

Mohan:

I don't think it is difficult it is only for teacher's part for first learning the tool and after that it would be not a problem...for me I did by trial and error then I got contract ...and it is easy [215RJ].

Suriathy:

I did not find any difficulty in any of those modules in the Web-tools.

Supporting these dialogues of the seven teachers, it was also evident from the observations with these teachers that they were able to use the Web-tools as an integral part of their teaching. However, Suriathy, Krishna Kumar and Azila faced problems during the Quiz and Web-tools administration modules. Thus, only four out of these seven teachers in this stage were able to adopt the Web-tools so as to facilitate teaching within their classroom and beyond. Some of the statements from the interviews with these four teachers show how they view accepting the Web-tools:

Gouri:

I think it is very convenient and very useful, there isn't much difficulties. So I find that it should be very effective to be taught in classroom.

Lau:

I think I don't have any problem lah it is just getting used to it lah.

Mohan:

I don't think it is difficult, it is only for teacher's part for the first time learning the tool and after that it would be not a problem. For me I did by trial and error then I got contract and it is easy. I don't feel any difficulty it is step by step just follow it.

Khalijah:

This is new one to me, this is very good this is very beneficial to both side you know... to parents and teachers [214RF].

From the above dialogues, we can notice that these four teachers were not only able to adapt to the Web-tools but were also able to identify a means to apply it within their classrooms. These four teachers who were successful in integrating the Web-tools and tried it in the classroom were also the teachers who could successfully journey through the entire Web-tools without much hindrance. These teachers with the experience gained with commitment were able to modify and infuse technology as a tool in their classroom. However, it is quite difficult to estimate if such commitment and ability of the teachers to infuse technology was due to the additional knowledge these teachers had before the conduct of the observations. Moreover, this has to be seen in the context of Shulman's argument (1986), which states that having knowledge of subject matter and general pedagogical strategies though necessary is not sufficient for capturing the knowledge of good teacher.

Thus Shulman emerged with a concept of blending content and pedagogy and named it Pedagogical Content Knowledge (PCK). Pedagogical content knowledge is a type of knowledge that is unique to teachers, and is based on the manner knowledge (what they know about teaching) to their subject matter knowledge (what they know about what they teach). Although Shulman did not discuss technology and its relationship to pedagogy and content, it was Punya Mishara and Matthew J. Koehler (2006), who blended technology with PCK (Pedagogical Content Knowledge) and emerged with a new approach, called TPCK (Technological Pedagogical Content Knowledge). This TPCK is a form of knowledge that expert teachers bring into play anytime while integrating technology with PCK. For example, in the case of Khalijah, during her observation session she mentioned that "I think yeah, everything I have learned in this six observations are good, but as I mention now there are few other things that you can do it to be more useful. For me, I'm a mathematics teacher, so I need space for using formula; I need something that can be used to do calculations and so on". From this statement, we can see that she is looking forward for more added features, in addition to what she had mentions "good" after all her six observation sessions, thus we can see that there seemed a "knowledge quest" and an uplift in her Technological Pedagogical Content Knowledge.

Therefore, the four teachers who were able to infuse Web-tools successfully without much hindrance and integrate it in their classroom teaching were those teachers who had sufficient TPCK (Technological Pedagogical Content Knowledge), which seems to have allowed them effectively to transform their subject knowledge for the purpose of technology teaching.

Further, this finding concurs the model for the adoption of new technologies by Hooper and Rieber (1995). They proposed a model that consists of five specific phases: familiarization, utilization, integration, reorientation and evolution. In the familiarization phase, the teacher simply learns how to use the technology. At the utilization phase, the teacher uses technology in the classroom but has little understanding of, or commitment to, the technology as a pedagogical and learning tool. During the integration phase, the technology becomes an integral part of the course in terms of delivery, learning, management, or other aspect of the class. In the reorientation phase, the teacher uses the technology as a tool to facilitate the reconsideration of the purpose and function of the classroom. Finally, teachers who reach the evolution phase were continually able to modify the classroom structure and pedagogy to include evolving learning theory, technologies, and lessons learned from experience.

According to Hooper and Rieber, many teachers progress only to the integration phase and do not transform their philosophical orientation of how learning can occur in the classroom through technology. From the various levels of attainment the teacher participants managed to journey through the Web-tools, showed that the lifespan of the majority of the teachers who were observed with the Web-tools were able to progress only to the utilization phase and not as mentioned by Hooper and Rieber that many teachers progress until the integration phase. However, when new technologies are adopted, learning how to use the technology may take precedence over learning through the technology as seen in the statement that "The technology learning curve tends to eclipse content learning temporarily; both students and teachers seem to orient to technology until they become comfortable," Goldman, Cole, and Syer (1999). Effective content integration takes time, and new technologies may have glitches. As a result, teachers' first technology projects generate excitement but often little content learning. Often it takes a few years until teachers can use technology effectively in core subject areas (Goldman, Cole, & Syer, 1999).

Looking into the levels of attainment of these teacher participants as a whole, it is worth noting that these outcomes were only based on the administration of Web-tools based on the conceptual framework of Salmons' 5 stage model, which indicates how the tutor's role should also change in order to support and encourage the students as they progress through these 5 stages. This 5 stage model is also at the core of Salmon's e-tivity frameworks for enhancing active and participative online learning by individuals and groups. The overview of the 5 stages can be summarised as follows.

1. Access and motivation: Welcoming and encouraging, this includes setting up system and accessing.
2. Online socialisation: Familiarising and providing bridges between cultural, social and learning environments, this includes sending and receiving messages.
3. Information exchange: Facilitating tasks and supporting use of learning materials, this includes searching, personalising software.
4. Knowledge construction: Participants start recognizing the value of text-based asynchronous interaction and take control of knowledge construction.
5. Development: Participants become responsible for their own learning and that of their own group.

Thus the teachers who were observed with the Web-tool, which was designed based on the above Salmons' 5 stage model. However, from the observation results only four teacher participants (Gouri, Khalijah, Loh and Mohan) seem to have experienced in the manner Salmons defines in his 5 stage model. Thus we can see that the learning curves of the teachers tend to bend as they progress through different stage of Web-tool. However, there can be many factors that influence the teachers in not effectively infusing the Web-tools. Some of the predominant factors can be: i) desire to adapt to new teaching style or ii) low level of self-efficacy or iii) the unwillingness to shift from traditional modes of delivery to Web-based teaching or iv) no conducive learning environment. Thus it would be worth looking at the diagrammatic illustration (Figure 1.3).

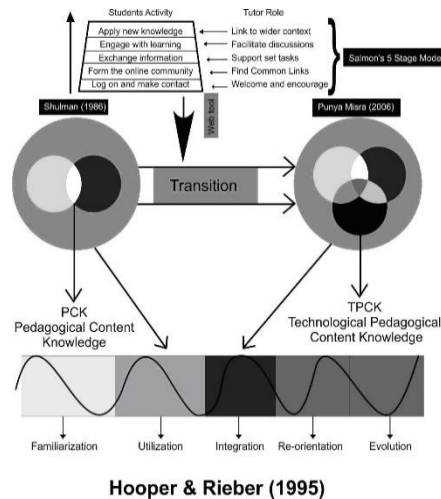


Figure 1.3

Conclusion:-

Although teachers in secondary schools in Malaysia are positive about integrating technology in their teaching using Web-tools, they seem to have not adequately prepared to take it to their classroom teaching. To make this problem even more complicated, there seems to be no opportunities for the secondary school teachers for acquiring these skills and as such, this framework stated in the figure 1.3, can be a model for those who wanted to test the technology acceptance of the Secondary school teachers, in imparting online learning in a blended classroom setup.

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