

A Challenge or Not: Understanding the Lived Experience of Public Elementary and Secondary MathScore Coordinators in the Implementation of Web-Based Math Program (MathScore)

Dr. Pedrito Jose V. Bermudo, Dr. Susana C.B. Bautista, Dr. Antonio R. Yango and *Dr. Severa Salamat

Graduate School, University of Perpetual Help system, Laguna, Sto. Niño, City of Biñan, Laguna, Philippines.

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The rapid development of computer and internet technologies has dramatically increased the ways of teaching and learning in the world over. Among these new approaches, online web based education has become a trending platform for learning. MathScore is a web-based math program for teaching and learning math. This study aimed to provide the acceptance of MathScore as a valuable tool in improving the quality of math education through an in-depth understanding of the lived experience of MathScore coordinators. The study utilizes a descriptive research design to understand and describe the challenging experiences of MathScore coordinators. The researchers used self-made closed-ended questionnaires to gather data from sixteen (16) respondents who were purposively chosen because they have experienced the challenges in the implementation of the program in the Division of Santa Rosa City, Philippines. The data gathered were analysed in theme clusters which showed that although there were challenges and hurdles such as lack of computers, poor internet reception, etc faced in the introduction and implementation of the program, however, the program was generally accepted and the coordinators were happy for the relative ease it would take to teach and learn math in schools. There is also the perception that the program will improve students love for math. The challenges faced could easily be dealt with by the government and school organizations through ensuring that computers are made available to the students and internet network providers should ensure improved network.

Keywords: MathScore, web-based education programs, online learning, teaching and learning, ICT.

INTRODUCTION

Many educators point out the importance of interaction in high quality online education. A good example is Bude *et al.* (2005) which stated that interaction is “education at its most fundamental form”. In addition, “keys to the learning process are the interactions among students themselves, which are the results from these interactions.” Frequently used technologies in online courses include textbooks, multimedia that combines text, images, and also audio

either through internet or CD ROM, streaming audio and video, and synchronous and asynchronous communication tools, such as discussion boards, instant messaging, and voice chatting, and file-sharing (McGreal, 2004). What is expected from educational institutions that bear the responsibility of raising individuals who meet the profile required by society is to raise human beings that are equipped with knowledge and skills, in other words training people who can access, use, transfer and produces the knowledge learnt for the development of the society (Akkoyunlu and Kurbanoglu, 2005). The rapid

*Corresponding Author E-mail: severa.salamat@deped.gov.ph

development in computer and internet technologies has brought about web-based education which is an improved way of teaching and learning. In this, we have the general online learning and the distance online learning. Many web-based programs have since been developed to aid online education, amongst these are the MatLab, Pro2, MathScore, etc. MathScore is a web-based math program for teaching and learning mathematics. In the traditional method of learning, mastery math needs one to develop a critical thinking skill or basic computation skill. MathScore provides both skills and as well provides a balance of these skills in a subtle, proper order. MathScore will first develop a strong conceptual understanding, then follow by computation practice, then solidify with word problems. Unlike other competing programs which provide too many awards often for accomplishing very little task by a student, MathScore on the other hand, makes it meaningful for a student who actually achieves something because it is worthwhile to achieve something with MathScore and the significance of such achievement cannot be overemphasized. This goal-setting mentality along with a focus on critical skills development often leads to starting test scores increases (MathScore.com, 2011).

The objective of this study is to investigate the challenges faced by MathScore coordinators in the implementation of MathScore program in the division of Santa Rosa City, Philippines. Though interaction is often billed as a significant component of successful online learning, empirical evidence of its importance as well as practical guidance or specific interaction techniques continue to be lacking and be given much attention. With all the debates and controversies about the challenges with the implementation of the program, the teacher (instructor) is the person who is in the right position to describe any challenges faced, hence the decision to investigate the instructors who have experienced the challenges in MathScore implementation.

Literature Review

Implementation of Technology: Changes or Challenges?

In e-learning, two major traditions prevail: one is that connections are made with people and the other is that they are made with resources (Weller, 2007). These two distinct streams show a different emphasis: the first one has communication and interaction between people at the heart of learning, and the second focuses on engagement with resources. Of course these distinctions have always been present even in traditional classroom learning: there has always been a triangle between educator, learners, and course content. These different views of learning have at their heart different perspectives on knowledge development. The question of how people become more knowledgeable and reach understanding is

an old one and has in the past decades, ranged from a process of transferring knowledge, or a process of aligning new knowledge with earlier experiences and knowledge, to a process of conceptualization, contextualization and active construction of knowledge, or reflection in action. Some theorists emphasize the social aspect of learning, while others emphasize the personal one. They used two metaphors to clarify how people engage with knowledge while learning. Participation in knowledge development activities is central in these theories. Connectivist developmental theories also fit in the latter category (Kop and Hill, 2008).

Boyce (2009) indicated that teachers should pay close attention to the type of instructional environment they implement, because it will convey what they value and it will have motivational consequences for their students. Gabbin and Wood (2008) denoted that studies involving Computer Learning (CL) techniques have produced mixed results on the effectiveness of using group incentives in the classroom to improve the academic achievement of accounting students. It can be discovered that CL is a systematic and structured teaching strategy, which can improve the drawback of conventional competitive learning and individual learning methods in which the training of cooperative and social skills is usually neglected. According to the theory of CL, the major strategies include Student's Team Achievement Division (STAD), Learning Together (LT), Team-Games-Tournament (TGT), Group Investigation (GI), and Kagan's six categories of cooperative structures: class building, team building, communication skills, thinking skills, information sharing, and mastery. Many distance activities reinforce content and allow students to apply knowledge. These include web-based review centers provided by text publishers, online content quizzes, narrated (and often interactive) animations, and links to web content, and discussion board activities. These create opportunities that would be difficult to incorporate into traditional classes, but they must be carefully employed to ensure effectiveness. Muchovej (2009) found that optional online quizzes did not significantly improve scores when quiz questions were recycled on exams. A low number of students completed the optional quizzes, suggesting that how the learning strategies are employed is important. Web-based technologies allow instructors to utilize sequentially built knowledge and skills.

The development of Information and Communication Technology (ICT) has given a tremendous boost in supporting new modes of delivery in training, teaching and learning within the last thirty years (Samuel and Zaitun, 2007). The inclusion of multimedia technologies into the classroom has changed the educational landscape and introduced important changes in the educational system and impact the way learners communicate information with each other (Muller *et al.*, 2008). In Malaysia, the Malaysian Government is taking

several initiatives to progress accordingly with the initiative to increase the role of science and technology education to achieve a develop country status by the year 2020. In addition, there is a strong push by the Malaysian Government to develop creativity, communication skills, analytical and critical thinking, and problem solving skills – skills that are significantly lacking in most of the current graduates (Tan *et al.*, 2009). This mismatch prompted Malaysian educators to seek new ways to develop these appropriate skills and knowledge in students in order to meet the rising expectations of the knowledge society. Institutions of higher learning in Malaysia have started meeting those challenges by integrating multimedia into various teaching and learning environments such as story telling (Norhayati and Siew, 2004), problem-based learning (Hong *et al.*, 2003), and web-based courses. However, the issue that still surround Malaysian education today is the need to adjust the way teachers deliver content and materials being presented in classroom, as many Malaysian classrooms are still very much curriculum based and teachers practice conventional teaching methods. This creates instructional relationships and learning processes that lack of interaction and feedback between teacher and students, and of communication and collaboration (McLoughlin and Lee, 2010). Learners still play a passive role in their learning by being inactive in their learning process. Therefore, educators in Malaysia are challenged to design a learning environment and curriculum that can encourage instruction, communication and collaboration among students and teachers, and increase their motivation to learn and be independent in their learning process (Laurillard, 2008; McLoughlin and Lee 2010). Even more challenging is the emergence of a new breed of technologically proficient learners, known as “digital natives.” These students are very much influenced by the digital environment and depend heavily on technologies to gain information and carry out interactions with others (Oblinger, 2003) and thus have high expectations of the learning methods delivered and presented. Teachers are thus challenged to find innovative approaches to engage students in their classrooms and keep them involved in the learning materials, and make rational changes in their educational practices (Oblinger, 2003). As such, challenges facing education now include creating new ways of using new technologies in teaching and learning that would satisfy and complement the new requirements for students (Laurillard, 2008; Kimber and Wyatt-Smith, 2010). New paradigms for teaching and learning are being introduced to address such issues. Research finding in recent years, stated the importance of encouraging students to control the learning process as a whole (McLoughlin and Lee, 2010).

Web-based education is more student-centered rather than teacher-centered education of traditional education. In the web-based learning process, the instructor decides on limit of the course or program, however, the student

picks the place and time to learn. Creative instructors can systematically link videos, powerpoint slides, discussion groups, and quizzes to the course to be studied and can use these means to teach analytical techniques or better human relations (Knowlton, 2000). Resistance to this innovation will also occur, but resistance occurs with each new innovation to some extent or another. Some people still refuse to use a telephone or go to a doctor for modern medicine. Many teachers and universities will resist web-based education but web-based education will continue to grow and in the course of its growth, no doubt many teachers and universities will poorly use the technology available to teach online just like many people drive an automobile poorly or use other technologies unwisely.

Web-based Programs: A call for the teachers and learners

Nowadays, web-based CL has become a hot topic in the study of learning environment and a tendency in instructional design (Naidu and Jarvela, 2006). In another study, Lancaster and Strand (2001) compared the academic performance of students in a managerial accounting course using cooperative versus traditional learning. They found that academic performance and student attitudes did not differ significantly. It is clear that there is no consensus on the effects of cooperative learning in accounting education. In addition, only a few scientifically founded and evaluated (e.g. pre-post-tests and comparison of groups) e-learning concepts exist in the context of university education. This study thus tried to apply web-based CL in accounting education to experimental teaching. Online education is still in a highly preliminary stage regardless of its extensive acceptance in many field of disciplines in higher education. As much as one might encourage instructors to be creative and transformative, such innovations take time to develop. People often feel comfortable building upon what they are familiar with instead of being creative. While such transitional stage from transfer to transformation is understandable, organizations should look for the best practices to help shorten this transitional process. Such organizational support not only improves the local program quality, but also helps expedite the overall development of distance education by providing more successful teaching and learning cases to the field (Bude *et al.*, 2005). In a research conducted by Lee and Paulus (2001) it is stated that in web-based learning settings, the basic interaction types are: learner’s interaction with self, learner-learner interaction, learner-content interaction and learner-instructor interaction. In web-based learning platforms, adults (particularly) consider all these four interaction types significant however it is also noted that in web-based learning settings these interaction types need to be benefitted in a balanced way. In a research conducted by Sadik (2006) on high school students to

detect the reality of interaction on web-based distance training, it was reported that the reasonable response tie to learner's questions increased their confidence in the usefulness of feedback. Nonetheless as regards to learner-learner interaction, learners do not consider e-mail as a quick method of interaction and value forum platforms as more beneficial settings.

In the study by Woo and Reeves (2008), it was emphasized that in web-based learning settings there is a good number of asynchronous forum settings where learners can share and discuss their opinions and form cooperation but still there are doubts regarding the contributions of these settings. Indeed, in relevant literature it is possible to come across some researches reporting that forums that enable asynchronous interaction are not more useful for learners than traditional teaching (Tallent-Runnels *et al.*, 2006). It can reasonably be argued that in both face-to-face learning settings and web supported learning settings, it is important that instructor provides quick feedback on troublesome subjects or learner questions. Lemley *et al.* (2007) point that there are many researchers on the effect of different types of feedback and these researchers demonstrate that feedback is greatly important for learners' performance. In their research aiming to detect the effect of immediate and delayed feedback on learners' performance, it was found that immediate feedback, compared to delayed feedback, have meaningful greater effect on learners' success.

Cao and Griffin (2009) reported that there are many research findings pointing that educational websites containing synchronous interaction provide positive contributions to learners. In asynchronous interaction, learners feel deprived when their questions are unanswered or cannot receive feedback. Learners' attitude towards internet with respect to different methods of interaction, in the post-test – pre-test score average differences of groups' attitudes towards internet are summarized with respect to different types of interaction, synchronous interaction develops learners' attitude towards web supported teaching and this finding is parallel to relevant literature. Accordingly it can be suggested that in web supported learning settings the use of synchronous interaction must be enabled as much as possible. According to Wong (2001) students' attitudes toward learning a subject vary based on characteristics of classroom instruction, such as types of assessment, topics, and material delivery tools. In the study of Wingard (2004) he found out that twenty percent of the staffs specifically sought the practicality and convenience of using the web for communicating easily with students, delivering assignments, posting grades, responding to questions, and making announcements. For almost a third of the participating staffs, personal interest in the technology or the direct relevance of the technology or to the course content influenced web use Wingard (2004).

Web-based instruction is still in an early stage of

implementation. Nevertheless, educational institutions, private industry, the government, and the military anticipate immense growth in its use. Obstacles to realizing the web's full potential for learning clearly remain as the appropriateness of pedagogical practices (Fisher, 2000) and the bandwidth bottleneck for certain learner requests (e.g., video on demand) (Saba, 2000). From an evaluation perspective, there has been an inclination to compare the web-based instruction with conventional classroom instruction (Wisher and Champagne, 2000). The historical findings on the effectiveness of conventional Computer Based Instruction (CBI) may be more appropriate basis for a comparison. An assessment of current practices thus may consider whether the capabilities of the web are being tapped, how interpretable the findings are, and how those findings compare with conventional CBI. According to Blankenship and Atkinson (2010), another important criterion for student success is their level of online learning readiness. These authors used the McVay (2000) Online Readiness Questionnaire and identified two factors, namely self-management of learning and comfort with non-face-to-face communication, as predictors of success for students in WBI (Web-Based Instructions) courses. It is possible that the inability of students to choose a course section based solely on their level of comfort with the delivery method also contributed to the lack of significant results in this study, particularly if some of the students in the WBI sections were not adequately ready for online learning. While in the study of Albalawi (2007), he stated that overall staff attitude towards WBI were positive, staff believed and held positive attitudes towards WBI and believed that online courses are the future of higher education in Saudi Arabia. Staff agreed that WBI provides a valuable service to students and they held positive attitudes towards it because they believed it opens higher education to a broader range of students than does traditional education. Additionally, the staffs did not think that WBI would jeopardize their jobs or that WBI technologies are complicated. They did believe, however, that WBI would create more stress for them as instructors. When it came to adopting WBI in Saudi Arabia universities, the staffs believed that WBI (a) will improve students' learning, (b) will encourage students to be more interested in learning, (c) will be a good teaching tool because of gender segregation in the Saudi higher education system, and (d) will create a challenge for faculty.

In the study of Gholani and Sayadi (2012), they mentioned that it is considerable that regardless of the field of study and departments in University of Kurdistan, most of the staffs stated that WBI can be a facilitating tool for teaching and learning in Iran's higher education. It confirms that staff's general attitude towards virtual education and its application is positive. Therefore, findings indicated there was a general positive attitude toward application of virtual education in university of

Kurdistan. But, it requires more research to know which model of virtual education fits conditions and facilities in this university.

Innovations in Mathematics teaching

Sullivan (2011) indicated that it is unreasonable to expect classroom teachers to address the needs of learners who have fallen many years behind the expectations for their class. Many schools need to have a strategy for supporting such students to reduce the gap between them and their peers. Two further actions which schools should commit to and undertake consequence to implementing any intervention, are to ensure there are systematic ways of monitoring the learning of the students who are being supported in this way, and an ongoing commitment to supporting the tutors and teachers who are involved in the program. Response to Intervention (RtI) is an early detection, prevention and support system that identifies struggling students and assists them before they fall behind. In the 2004 reauthorization of the Individuals with Disabilities Education Act (PL 108-446), states were encouraged to use RtI to accurately identify students with learning disabilities and encouraged to provide additional supports for students with academic difficulties regardless of disability classification. Although, many states have already begun to implement RtI in the area of reading, however, RtI initiatives for mathematics are relatively new. RtI begins with high-quality instruction and universal screening for all students. Whereas high-quality instruction seeks to prevent mathematics difficulties, screening allows for early detection of difficulties if they emerge. Intensive interventions are then provided to support students in need of assistance with mathematics learning. The levels of intervention are conventionally referred to as “tiers.” RtI is typically thought of as having three tiers each tier is defined by specific characteristics (Gersten *et al.*, 2009).

Many students dislike mathematics class. Volante (2007) reported that in Ontario, the Education Quality and Accountability Office (EQAO) tracks student attitudes toward mathematics, noting shifts in percentage points from year to year but indicating overall that significant numbers of children in Grades 3 and 6 do not like this important subject. Complementary research suggests consensus regarding the reasons for this widespread belief – from the elementary child’s perspective, mathematics is hard, boring, mostly irrelevant and unrewarding EQAO survey data also highlight that proportionate numbers of children (and fewer girls) do not believe that they are good at mathematics, or that they can “do” mathematics. We, as educators, must turn our attention to resources and strategies that improve students’ relationships with mathematics content and processes and pique students’ motivation, emotion, interest and attention. Multiple non-traditional activities

and attention-grabbing resources can spark curiosity about mathematics, improve appreciation for and interest in mathematics and contribute to understanding the relevance of mathematics in everyday life. In these ways, we may impact how mathematical knowledge grows and connects and thus, improve achievement scores (Colgan, 2014). An interesting finding in the study of Moyer-Packenham *et al.* (2008) was the way virtual manipulative were used by teachers as cognitive technological tools to support learning during K-8 mathematics instruction. As the results showed, the virtual manipulative were central to the mathematics learning and content development and were often used in combination with physical manipulative. Future research should examine how teachers’ perception of the mathematical, cognitive and pedagogical fidelity of using virtual manipulative influences their choices of how and when to use them in instruction. With respect to the teachers in the present study, the findings suggests that teachers’ choices about which virtual manipulative to use, what content to teach using them, and whether to use virtual manipulative in combination with physical manipulative were potentially influenced by familiarity with similar physical manipulative and beliefs about the mathematical, cognitive and pedagogical fidelity of virtual manipulative use. Further examinations, using in-depth interviews with teachers and observation of classroom implementation, have the potential to reveal additional insights into these results.

Nguyen and Kulm (2005) showed that students in Web-Based Math Instruction (WBMI) made more improvement on Mathematics achievement, a positive mathematics attitude and mathematical self-efficacy, and declination on mathematics anxiety. Students in the WBMI were also provided to receive immediate and adapted feedback and the opportunity of more practice for better mathematics achievement scores. It could be concluded from the results that the use of WBMI was superior to the TMI. In addition, teachers can use technology to introduce better mathematics (Rochelle *et al.*, 2000) for example, teachers can focus less on memorizing facts and performing routine calculations and more on developing ideas, exploring consequences, justifying solutions, and understanding connections – the real heart of mathematics. In addition, teachers can introduce more advanced mathematical topics earlier. Both the opportunity to teach math better and to teach better math should be considered in school technology plans and teacher professional development. Rosenshine (2012) mentioned in his study that education involves helping a novice develop strong, readily accessible background knowledge. It is important that background knowledge be readily accessible, and this occurs when knowledge is well rehearsed and tied to knowledge. The most effective teachers ensured that their students efficiently acquired, rehearsed and connected background knowledge by providing a good deal of instructional support. They provided this support by teaching new materials in

manageable amounts, modeling and guiding students practice, helping students when they made errors, and providing for sufficient practice and review. Many of these teachers also went on to experiment, hands-on activities, and they always did the experimental activities after (not before) and the basic materials were learned.

In recognition of the importance of the topic, a National Mathematics Advisory Panel was recently established within the U.S. Department of Education. Its charge is “to foster greater knowledge of and improved performance in mathematics among American students ... with respect to the conduct, evaluation, and effective use of the results of research relating to proven-effective and evidence-based mathematics instruction” (Bush 2006). Members of the panel have been assigned to four task forces focused on critical areas of mathematics instruction: learning processes, conceptual knowledge and skills, instructional practices and materials, and teachers and teacher education (National Mathematics Advisory Panel, 2007).

RESEARCH METHOD

Participants of the Study and Ethical considerations

Sixteen (16) MathScore coordinators consisting of 9 males and 7 females who had experienced the challenges in the implementation of MathScore program in the Division of Santa Rosa City were purposefully chosen. The average age of the participants is 38 years old. It is worthwhile to note that all known research ethics such as signing of informed consent by the participants, assurance of anonymity of the participants, etc were applied prior to, during and after the research.

Instrumentation and Validation

This study utilized self-made closed-ended questionnaires having multiple in-depth questions and this was validated by a group of experts in the field of qualitative research, mathematics and web-based education.

Data Gathering Procedure

The researchers applied a descriptive research design and this entails the participants to reveal personal thoughts and feelings on their lived experiences of a concept or phenomenon, in this study it is the challenges on the implementation of MathScore program. The researchers administered the verbal interview themselves to the participants whom were individually allowed to choose the venue for their interviews. Questions such as 1) What have the participants experienced in the implementation of web-based math program (MathScore), and 2) How have the participants experienced the challenges in the implementation of web-based math program (MathScore), put forward to the

participants. Data were gathered through video recording and note taking.

Treatment and Analysis of Data

Data were built from the first and second central research questions as well as probing questions by going through the interview transcriptions, highlighting significant statements which were sentences or quotes that provided an understanding of the participants' experience in the implementation of MathScore. The researchers, then, developed clusters of meaning from these significant statements and they were analyzed and categorized into themes.

RESULTS AND DISCUSSION

As to what the participants' experiences in the implementation of MathScore

Theme 1: Feelings and Aspirations - Although exposed to different workplaces and confronted with divergent experiences, the participants still conceived the same feelings and aspirations in the implementation of MathScore. Their responses were all affirmations of their passion as Math teachers and their hope is that the program could help them to effectively teach the subject and create room for the students to love the subject which generally has low acceptance as a result of learners having negative attitude about the subject. One of the participants felt that applying web accessibility standards and/or guidelines was not difficult and complex because those standards and guidelines were clearly stated. The participants' views are shown below:

(1) I have many things to share about how I feel in doing MathScore together with my students. First, I can see the interest of my students in MathScore even those who don't really excel in my ordinary math class, when I say that we will have our MathScore class everybody would really shout YES! they were really excited to have MathScore, here they can express themselves and they were able to do advance study so that when we get back to our regular class settings they have something to share that they had encountered in their MathScore activity. Second, our students are very lucky that they had MathScore accounts not all students can avail this kind of opportunity but they had it, that's why they should treasure this opportunity.

(2) I am glad that we have this kind of program for our students, it is a big help for our students, and the teacher can customize some topics for a particular student having difficulty in some levels of Mathematics. And they can play edufighter wherein they can develop their speed and accuracy in solving math problems at the same time having fun while learning.

In the study of Wingard (2004), he found out that twenty percent of the participants specifically sought the practicality and convenience of using the web for communicating easily with students, delivering assignments, posting grades, responding to questions, and making announcements and almost a third of the participants have personal interest in technology or direct relevance of technology or to the course content influenced web use. In their study, Gholani, and Sayadi, (2012) indicated that the attitudes of the participants toward web-based Instructions (WBI) were positive, that they believed and held positive attitudes towards WBI and believed that online courses are the future of higher education in Saudi Arabia. The participants agreed that WBI provides a valuable service to students, opens higher education to a broader range of students than traditional education does.

Theme 2: Features to Treasure - Increasing competencies, customization of accounts, real time scoring or checking of results and of course the gamification (edufighter) are some of the features the participants believe that made MathScore special and will have general acceptance. The participants' views are shown below:

(1) Edufighter 'the gamification' feature of MathScore allows the learners to play without realizing that they are actually learning the skills of speed and accuracy in solving math problems. Another thing is that MathScore automatically generate worksheets suited for each learner and in real time the learner can view their scores and progress.

(2) I like the worksheets generated in MathScore, I don't have to spend much time in preparing and at the same I also like edufighter for here the learners are able to solve math problems with speed and accuracy.

(3) It is real time, giving immediate scores for a finished task were the learners are motivated to answer more worksheets that can increase their scores and get higher rank.

(4) Customization of accounts for learners, that if they had difficulty in fractions you could customize it for him/her to have more worksheets in fractions so that they could master a particular topic that they had difficulty on.

Sfard (1998) cited by Kop and Hill (2008) used two metaphors to clarify how people engage with knowledge while learning. The first one is of acquisition, where learners acquire knowledge, pre-packaged by educators, as in behaviorist and cognitive theories, which have been the norm in formal education settings for a long time. The other metaphor is one of participation, where learners are actively involved in a participatory endeavor. This metaphor relates to situated and social theories, such as social constructivism, action theory, and communities of practice. Participation in knowledge development

activities is central in these theories. While in the study of Muller *et al.*, (2005), the inclusion of multimedia technologies into the classroom has changed the educational landscape and introduced important changes in the educational system and impact the way learners communicate information with each other. In their study, Samuel and Zaitun (2007) claimed that the development of Information and Communication Technology (ICT) has given a tremendous boost in supporting new modes of delivery in training, teaching and learning within the last thirty years.

Theme 3: Importance and Implications - There are important things that this study revealed to us, that there were teachers who were motivated to teach because they had different avenues of teaching the subject and new experiences for the learners. Core skills in Mathematics are very important for all the learners and in here they were given the emphasis so that learners would never be afraid of the subject but they would appreciate and love it since different cultures in Math class were offered to them. The participants' views are shown below:

(1) There are lots of students who changed their feelings about the subject and their level of interest to learn mathematics with the implementation of MathScore, they were able to encounter other topics that are not yet discussed in their classroom but because it is web-based math, it allows the learners to go back to the topics they had difficulty and in here they could review the subject and are allowed to have advanced study in some topics.

(2) Maybe because in doing MathScore they are not in their regular classrooms, here they are facing the computers and at sometimes they should beat the computer in an edufighter game, they are more eager to excel and are more motivated to perform well.

(3) Speed and accuracy in solving math problems are developed in MathScore, an avenue for the learners to improve their own skills.

(4) I can see that there are lots of learners who are excited to do MathScore and this serves as my inspiration and motivation to improve my teaching skills and to believe that there are chances for my learners to learn, enjoy and love the subject with the help of MathScore implementation.

According to Knowlton (2000), web-based education is more student-centered than teachers-centered of traditional education. Though the teacher decides the limit of the lesson, however, it is the student who choose the venue and time to learn. Also, students can choose to go over the lesson as many times as s/he wishes.

As to how the participants experience the challenges in the implementation of MathScore

Theme 4: Challenges and Hurdles - The challenges

and hurdles of the participants in the implementation of the web-based math program focused on internet connectivity, limited computer units and scheduling of classes due to limited resources. It was reported that even with all these challenges, the teachers were always look for ways to deliver quality lesson to the students and that some sacrificed personal resources to ensure that they build the interest to learn in their students. The participants' views are shown below:

(1) The only problem I encountered in the implementation of the program was the internet connection, for some students who can afford it, they can do MathScore in computer shops, but for others they only rely on computer laboratory of the school but we have slow internet connection here plus the fact that we only have 10 working computer units now.

(2) If we only had good/excellent internet connection it would be very easy for us teachers and students to do MathScore.

(3) Since we had limited number of computer units to be utilized for the implementation of MathScore what we are trying to do is scheduling of MathScore classes. Those students in morning class can use the com lab in the afternoon and those students in afternoon class they have to be in school earlier for their MathScore class.

(4) Here in our school, the problem is the stable internet connection, the signal is very poor, there are times that we cannot even connect due to poor internet connection, but there are times that we could have excellent connections but it rarely happens.

It is a common knowledge that many students dislike mathematics classes. Students' beliefs are correlated to their attitudes about, and achievement in, mathematics, if these dispositions are negative, learning is impeded and academic success is limited. Multiple non-traditional activities and attention grabbing resources can spark curiosity about mathematics, improve interest in and appreciation for the subject, and contribute to understanding the relevance of mathematics in everyday life. In these ways, we may impact how mathematical knowledge grows and connects and thus, improve achievement scores. (Colgan, 2014). Besides the possibilities and limitations that exist when using modern technology when teaching and learning mathematics, there might also exist possibilities and limitations in the external constraints that decide what - and shapes how - mathematics should be taught. The complexity in using modern and advanced technology in mathematics education implies that this is an area in need of further research about different issues. There is also a substantial need of development concerning different ways to train and educate all those who are involved in decisions about and realization of education in mathematics (Skolverket, 2003, p. 45). In his study, Kaput (2007) claimed that the use of technology has a

long history in mathematics education. It was also stated that whereas physical manipulatives are the right tangible form for elementary school, ICT-based tools are the right tangible form for secondary school.

Theme 5: Motivations and Sacrifices - As to the steps on how the implementation of web-based math program would succeed; the coordinators were enthusiastic and resourceful in determining ways on how they could implement the program in their respective schools with proper support of their school heads. The participants' views are shown below:

(1) Our school head is very supportive in the implementation of the program; she helps us in encouraging our learners to maximize their MathScore accounts.

(2) With the support of other teachers and students we were able to acquire pocket wifi since the problem here in our school is internet facility, with this our learners are able to do their MathScore. When the load was already consummated, as a teacher seeing your pupils' eagerness to answer different worksheets how can you not buy a load so that the pupils can continue their MathScore activities?

(3) Support and encouragement of other teachers are also important, that's why I really do talk to my co-teachers to allow their students if they have free time to spend it in doing their MathScore.

(4) Other people in the community like our Barangay Officials as stakeholders of the schools can also help us in the implementation of the program by providing other facilities that we can use in doing our MathScore.

Online education is still in a highly preliminary stage regardless of its extensive acceptance in many fields of discipline in higher education. It is conceivable that faculty members will attempt to build up from traditional teaching experiences, especially when there is lack of practical guidance on how to carry out online instruction. As much as one might encourage instructors to be creative and transformative, such innovations take time to develop. People often feel comfortable building upon what they are familiar with instead of being creative. Such organizational support not only improves the local program quality, but also helps expedite the overall development of distance education by providing more successful teaching and learning cases to the field (Bude et al., 2005).

Theme 6: Suggestions to Succeed – The interest of the participants in the implementation of the MathScore program was very evident among them. Majority of the participants acknowledged that the implementation of MathScore in their schools helped them and their learners in many ways. They were able to use the worksheets as part of their teaching activities and they

were able to get their students results in real time. Learners were also able to remember topics they encountered in MathScore. They were able to perform on their own pace and begun to understand and love the subject. The participants' views are shown below:

(1) *It is a big help and I believe that continuation of MathScore implementation is really important not for us but for our learners.*

(2) *I would like the implementation of MathScore because even our LMs have limited worksheets that could adjust to the present needs of our learners, MathScore has this kind of feature wherein worksheets to be answered by the learners are of different styles suited to the needs of each individual learner.*

(3) *This kind of program is what we need nowadays, this really takes time before we could really say the effects it can bring to our learners but we can't see it if this kind of program will stop.*

In their study, Nguyen and Kulm (2005) showed that students in Web-Based Math Instruction (WBMI) made more improvement on mathematical achievement, developed positive mathematics attitude and mathematical self-efficacy, and decline on mathematics anxiety.

Conclusions

Despite that online education is still in a preliminary stage, its extensive acceptance in higher education cannot be overemphasized. As a result of the overwhelming advantages of web-based education over traditional method of learning, teachers as well as students now prefers the use of web-based programs to teach and learn. MathScore been a web-based program for teaching and learning mathematics was immediately accepted upon its implementation. Though there were huddles and challenges faced, however, these do not deter math instructors as well as their students from prioritizing the program over the traditional way of teaching and learning mathematics. It is a general knowledge that most students dislike mathematics for one reason or the other, however, upon the introduction of MathScore, this is fast becoming a thing of the past as students are now developing interest and love for the subject knowing the different features such as edufighter that the program offers.

Recommendations

For effective teaching and learning in our schools, the use of MathScore and other web-based programs should be included in school curricula. Web-based programs to aid the easy and quick learning of other subjects should be developed and school administrators should give proper orientation, training and supports to their teachers

with regard to the efficient use of web-based programs to arouse students' interest in the different subjects especially in mathematics. Also, government, NGO's, corporations and school authorities should provide sufficient computer units and excellent internet facilities for schools whereas internet network providers should be task with the job of ensuring stable network always. Regular routine maintenance of schools computer laboratory (ICT centers) should be mandatory to ensure longevity of the computer units. Parents and guardians are not left-out as they are encouraged to provide computer unit, stable internet and web-based programs like MathScore at home for their children or wards to effectively utilize their leisure to develop themselves academically. Finally more features such as instructions that aid easy and quick understanding of the program should be included in the MathScore. Future research should be done to ascertain the impact MathScore has on students using mathematics students as the respondents for the study.

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