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RESEARCH ARTICLE

STUDENT-CREATED VIDEOS AS ASSESSMENT OF LEARNING IN THE MATHEMATICS CLASSROOM: PRE-SERVICE TEACHERS' EXPERIENCES AND REFLECTIONS.

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Abstract

Traditional tests may be less direct in determining the degree of students' learning. With the presence of several gadgets nowadays such as webcams, phone cameras and social media in the lives of the students, asking them to create videos to discuss mathematical concepts or determine a real-world scenario showcasing the geometric theorems provided the instructor some insights into students' thinking beyond the paper-pen test.

This study involved seventy-one freshmen students who constructed four videos spread in one semester in Solid Geometry course. Majority of the students reported that they learned new skills such as video editing and using video software while completing the requirements. They also expressed some social, leadership, self-confidence and time management skills were learned. Patience working with a partner was expressed as a virtue developed in doing the video projects. Students shared their experiences in terms of planning, organizing, collaborating, writing and analyzing. Though it was the first time for students to have a course with videos as one of the sources for assessment, majority agreed that it was an appropriate strategy for their instructor to determine the extent of their learning.

Student feedback was presented and discussed in the paper. Amount of time needed to do the video requirement was the one of the difficulties students need to deal with. They also presented their suggestions for a more excellent academic experience with the course. The videos showed the level of critical thinking used as well as creativity to explain some mathematical concepts. It is believed that asking the students to create the video played a critical role in increasing not only the passing rate but the degree of understanding of the concepts.

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Introduction:-

Assessments in the higher education have remained to be more of the paper-pen type to this day. Ask some college students the number of professors who have used technology for assessing them and one begins to realize that there is not much difference from the ways things were 20 years ago. Much more if you ask the number of professors who have used technology as a tool for assessment. Technology as a tool for assessment may be common in other well-developed countries, but in this part of the world, it is still rarely done. Where is the gap? Perhaps there is a lack of

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more exploration on the power of technology to be used as a tool to clearly determine the skills developed by students or the competencies they have enhanced that most are still using the paper examinations to have knowledge on the extent of students achieving the objectives for the course. Such discrepancy was defined by the Pew Institute in 2002 that outside the school students' use of the internet is rich in contrast to limited and rote use in school.

The challenge for educators nowadays is to explore ways to engage students as learners in the classroom amidst the presence of the internet and technology. Instead of competing, educators may consider integrating technology into the curriculum. In the mathematics classroom, how students think and learn has been done traditionally. Several studies pointed out that to be able to determine students' learning the use of learner-centered pedagogical approaches have to be employed in class.

Theoretical Considerations:-

From the theorists Piaget and Dewey, constructivism specifies that the approach to learning calls for active student engagement in the learning process, providing opportunities for students to construct their own understanding of key concepts and information. As a tertiary educator, facilitating learning for students to have deep understanding must be provided for learning to occur. Constructing the videos for students to show that they can go beyond just providing proofs and showing mathematical solutions were asked. With the activity of creating the videos, they were requested to reflect on their experiences as Dewey (1933) suggested. There is a close relationship between learning and reflection as Ong (2008) elaborated that reflection in a form of a journal poses great possibilities for a learner to articulate his thinking and hence construct meaning from the concepts and information that he faces. Such process becomes a vehicle for the learner to bridge the gap between the different knowledge in various contexts and to make it meaningful to himself.

Kibbard (1996) in her book the Teacher's Guide to Performance-Based Learning and Assessment stated that in learning, people obtain content knowledge, acquire skills, and develop work habits—and practice the application of all three to “real world” situations. Creating videos to showcase and demonstrate learning is a performance-based assessment. Students not only do what professionals do, it is also meaningful and engaging as they do not just sit passively in the classroom. The students were also provided the chances to be creative as they were the ones who chose how they thought can best show the proofs with real solid figure objects.

Objectives and limitations of the Study:-

This study analyzed the students' experiences and their reflections through their responses during the interview, focus group discussions and written reflections. Specifically, this study aimed to determine the students' experiences in terms of collaborating with others, their challenges or difficulties in creating the video. With the students' reflections, the study identified their insights, extent of using collaborative skills, other technology skills learned and their level of engagement. Though this study is limited to students' sharing of their experiences and reflections, it was believed that this may also give the educators an idea of the extent students have learned the concepts.

Research Design:-

This study utilized the qualitative research design, specifically employing the case study method. This design and method were found appropriate as the researcher wanted to look into the experiences of the students in constructing the videos in Solid Geometry. The researcher did direct observation and interactions with the participants. The synthesis and analysis of the participants' reflection and experiences were carefully done by the researcher.

Participants and Locale of the Study:-

Seventy-one students were the participants of the study. Due to a failure in grades in the past, a handful of these students took the course for their second time. Solid Geometry is part of the major field of courses in the program Bachelor in Secondary Education with specialization in Mathematics. The students came from two sections from the College of Policy Studies, Education, and Management of Mindanao University of Science and Technology (MUST), now called the University of Science and Technology of Southern Philippines (USTP). MUST or USTP is one of the prime universities of Cagayan de Oro in the Philippines. It has achieved its university status in January 2009 with a mandate stipulated in Republic Act 9519 that it shall provide advanced education, higher technological, professional instruction and advanced instruction in mathematics, science, technology, engineering, and advanced research and extension work in human resource development in critical skills and competencies required for global competitiveness.

Results And Discussion:-

Different methods of assessing learning in Solid Geometry were explored and employed throughout the course. In this study, the reflections and experiences of the students on the assessment method used, specifically the student-created videos were analyzed. Realizing that students have varied learning styles, the students were required to create their own videos using real world objects to prove a theorem or solve a problem. Responses and data gathered from the reflection essays, focus group discussions and during the interview revealed a number of themes. The discussion is below:

Developing collaborative skills and student engagement:-

Beyond 80% of the students expressed that requiring them to create a video improved their collaborative skills and made them more engaged with their studies. Only a handful of the students expressed that they did argue with their partner and some got upset for their partner's lack of responsibility. Students shared that they learned to be more understanding and patient working with their classmates. In a study by Tang (2006), he used Spontaneous Collaborative Learning (SCOLL) which is more likely similar to how this research was conducted wherein the activity is not solely structured by the teacher but more of the students. The results revealed that this approach promoted the engagement of a deep approach incorporating high level cognitive strategies, and in turn learning outcomes reflected in a higher structural complexity of assignments than those approaches and outcomes of students who worked individually.

One of the 21st century skills that students nowadays have to learn is on working with a team. In the workplace, no one does something alone at all times. It is with this that students should be developed to learn to work with a team or with someone else. Asking the students to create their video as one assessment requirement in class gave them the chance to reflect on the experience working with someone. A third of the students shared that they needed to explain to their partner the theorems or definitions before filming which took a lot of the time. But even with this, they still expressed that the activity was probably a lot easier still than when done alone.

Ability to plan ahead have been developed by some students as they need to map out what they are to do after learning in their previous experiences, especially after their first video requirement, that such task takes some time. Some of the responses:

"We need to agree on the time and on what to do."

"We asked help from other students in other programs."

Understanding of the Solid Geometry lessons and concepts:-

One cannot give what one does not have. Similarly, a student cannot explain something they do not understand. Almost 90% of the students said that they needed to revisit the concepts learned in class and realized that they have not fully grasped the ideas which lead them to have more discussions with their partner and made them want to read more and do some more research from the different websites.

Respondents found that they do not want the audience to be more confused with whatever they are explaining so the need to consult even other groups to determine if their explanations were clear to others. Several of the students explained that they understand better when they began explaining the concepts on video. Some of the responses written on the reflection essays relative to this are below:

"I was able to understand the theorem which I did not understand at first."

"I understood the dihedrals more because I am required to discuss on video."

"It was easy to understand the theorems now since we need to visualize how it looks and how it applies with real world objects."

"I studied harder than I used to."

These responses made the famous line of Bobbi DiPorter's 'Quantum Learning' true that 90% of what was learned happened when the individual taught the concept to others.

Learning new technology skills:-

Three-fourths of the students claimed that they have never uploaded a video in youtube or in facebook. Hence, the apprehensions for the requirement but they also shared that they felt excited to do the project. However, when they actually did the video, mostly expressed that they never thought it would be difficult and taxing especially that there

are skills in doing a video that they have not developed yet. Students also expressed that they had a chance to explore new things like editing, writing subtitles, converting files, using softwares etc.

In this age and time, future teachers will teach with the integration of technology. If the tertiary education will provide the experiences like in the past 20 years, integration of technology from the future secondary mathematics teachers cannot be expected.

Difficulties and challenges met:-

The University takes pride in providing quality education for the poor and the deserving students. A high percentage of the population is on scholarship that students attend classes with limited resources and funds. With this context, only a handful of the students personally own a laptop or notebook, some did not have any camera phone much more a digital or dslr camera. Given the situation, the greatest constraints the students encountered is the finances and funds for creating a video since editing and uploading were done in an internet station or café where they were charged on a per hour rate. Add to this, some internet cafés have very slow internet connection that uploading videos would take hours thus requiring more amount to pay.

Having limited funds may be easier to deal with as shared by some students but dealing with limited availability of common time with their partner has been a major issue. The faculty and administrators have observed the same that the students were very much loaded with 29 units on the average per semester. Even with this, beyond 50% of the students expressed that they learned to make use of the only available time and learned to manage as well. Majority also realized that they were used to cramming and doing the school work when due dates were near but had to change this attitude since creating videos and the demands for time to complete the project seemed unpredictable.

Plane geometry is the course taken before the Solid geometry. Some of the difficulties with learning the concepts in Solid geometry sprang from the fact that students have not fully learned and developed the skills from Plane geometry necessary to be able to appreciate and use in Solid geometry.

Anticipating worse scenarios was not part of the students' attitudes. Having experienced the sd card with a virus, videos not to opening and playing, having corrupted files, no audio can be heard etc made students be more cautious.

Views on having videos as assessment of and for learning:-

Students were also asked about their thoughts on having them create videos as one of the requirements to assess their learning of the concepts. A close to 90 percent expressed that they find the requirement as more appropriate to determine whether they have learned and achieved the objectives set for them in the course. One student shared during the focus-group discussions which everyone agreed that she found it difficult to explain and find real objects during the time when she did not understand the concept. To address the dilemma, she read the theorem several times, asked for her classmates' explanation so she will sound convincing when discussing in front of the camera.

Ten percent of the students shared that they think that other students just made a script to look like they understood the concept and had a guide while filming. They think that though it may assess their learning, there has to be some alternatives aside from coming up with videos for they felt that showing the real learning in videos was not really accurate.

Students' communication skills, specifically speaking the English language sometimes gets in the way in determining exactly the level of students' learning. Some students expressed that they may have understood the concept but explaining in English was quite a challenge. Several students have not developed fluency in the English language. The instructor, who is also the researcher, emphasized in class that grammar and use of the English language was not part of the assessment the same as their editing skills and quality of the video. The students felt that creating the videos was more advantageous to those with a good command in the language.

Recommending student-created videos as part of other courses:-

A close to 80% of the students expressed that they wanted the next batches of students taking the same course to experience the said activity. They shared that though the creation of the video did not come easy; it was worth the time and effort especially that they discovered that technology can be used to express what they have learned in class. Several students expressed that it felt good that they knew other skills in the class beyond the usual rigors of

mathematics. They view mathematics in a different way now. They thought that there was no other way to determine learning except to solve on paper and do the usual proving and memorizing of theorems and definitions.

Majority remarked that having to create videos made them more responsible of their own learning since they needed to make sure they do understand completely. In the past, they said, they did not bother if they have complete understanding but having to do the video made them try some strategies to fully understand whatever was missed out from the instructor's discussion in class.

Generally, students were grateful of the experience. Some expressed it was the first time they have exerted so much effort for a school requirement. Most say that they had a great experience learning mathematics outside the classroom and seeing the geometry in buildings and posts. Students expressed that they realized now that theorems, lines, dihedrals came alive in the things around them.

Conclusions and Recommendations:-

Authentic learning and assessment have long been acknowledged by some educators as relevant for the tertiary undergraduate students. However, implementing an authentic assessment is of a different issue. In this study, it was found out that employing real world situations without sacrificing instruction time and content can be done when student-created videos as assessment of learning are part of the course. Most importantly, the teacher can accurately determine the students' achievement of the course objectives as paper and pen assessments are now coupled with performance-based.

In the workplace for our future teachers, ability to collaborate and be able to be a good team player is expected. These skills will not be enhanced if academic experiences will not provide a venue. The creation of a video as a course requirement provided the students to interact with peers. In turn they also develop the ability to handle disappointments, to deal with difficult people as real work places have.

The pre-service teachers who will eventually teach the next generation have to be more comfortable with technology before it is expected that they can even integrate it with their teaching. It is recommended that studies on having undergraduate students to be less anxious with computers be explored. It is also recommended that studies be conducted to be able to identify if integrating technology in classroom improved students' self-efficacy.

This study did not look into the effect of employing student-generated videos on the quality of students' learning as well as to the level of understanding. A more scientific and quantitative method to determine the effect of using such strategy may be conducted.

References:-

1. Costa, A L. and BenaKallick. Learning and Leading with Habits of Mind. Dec 2008.
2. Dewey, J. How We Think. A Restatement of the Relation of Reflective Thinking to the Educative Process. Boston: DC Heath (1933)
3. Hibbard, K. Teacher's Guide to Performance-Based Learning and Assessment. (1996)
4. Hew, KheFoon. "Use of audio podcast in K-12 and higher education: A review of research topics and methodologies." Educational Technology Research and Development 57.3 (2009): 333-357.
5. Hofer, Mark, and K. Owings-Swan. "Digital moviemaking—the harmonization of technology, pedagogy and content." International Journal of Technology in Teaching and Learning 1.2 (2005): 102-110.
6. Lombardi, Marilyn M. "Authentic learning for the 21st century: An overview." Educause learning initiative 1.2007 (2007): 1-12.
7. Ong, R. The role of reflection in student learning: a study of its effectiveness in complementing problem-based learning environments. Centre for Educational Development Republic Polytechnic. Singapore 248922
8. Tang, K. C. C. "Spontaneous collaborative learning: A new dimension in student learning experience?." Higher Education Research and Development 12.2 (1993): 115-130.