PROJECT UP-SIP: UTILIZATION OF GOOGLE APPS FOR SCIENCE INVESTIGATORY PROJECT AS AN INTERDISCIPLINARY ASSESSMENT FOR STEM 11 STUDENTS

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ABSTRACT

Science education always involves investigation, experimentation, and conceptualization of new ideas and applying it to contribute to the improvement of the society. The quality of science education must not be compromised amidst the pandemic and in the adoption of distance learning due to the health protocols.

This action research aimed to help every STEM 11 student in crafting Science Investigatory Projects (SIPs) as an interdisciplinary assessment with the use of Google Applications. In the study, the Most Essential Learning Competencies that can be assessed through the SIPs were identified. The students with the teachers' guidance were able to formulate and proposed relevant SIPs, mostly in Disaster Readiness and Risk Reduction. The identified MELCs were assessed through the SIPs crafted by the students. The interdisciplinary approach to SIPs enabled the students to come up with just one output/ performance task which is evaluated and graded in different subjects thus, eliminating the burden of creating different research projects in different subject areas. The researcher was able to assess the effectiveness of utilizing Google Apps in collaborating and crafting SIPs.

The results of the study showed that the teachers and students perceived that Google Apps such as Google Classroom, Google Meet, Google Docs, Google Forms, Google Sheets and Google Sites are effective tools in studying, preparing, communicating, collaborating and presenting their final SIPs. Following the utilization of the different Google Apps, the STEM 11 Students were able to craft and present twenty – five relevant Science Investigatory Projects that were assessed as an interdisciplinary learning output in different subject areas.

Keywords: interdisciplinary assessment, science investigatory project, applications

INTRODUCTION

Science, Technology, Engineering and Mathematics (STEM) Strand is taken by learners who wishes to take paths in either Science, Technology, Engineering, Mathematics, and other related fields. The strand aims to inculcate the concepts and theories in Science and Math and apply those through various technology and engineering disciplines. Teaching STEM students involves designing activities and projects that will allow them to apply the various scientific and mathematical theories and concepts they have learned in different subjects. As Senior High School Students, crafting Science Investigatory Projects (SIPs) is one of the best activities that they engage with. SIPs are research – based projects or study that is performed by students. The main goal of SIPs is to provide students with a more engaging way to learn about Science, Math, Research, Applied Sciences and Engineering and presenting their output through an English research papers and visual presentations aided by technology. Working on an SIP is a great avenue for STEM Students to practice scientific attitudes while applying the concepts learned from various disciplines.

Due to COVID – 19 pandemic, schools shifted from face – to – face learning to distance learning. In times like this, the internet became a staple tool in delivering lessons, concepts, and skills to students. With the use of the internet, collaboration became easier with appropriate online platforms and applications. Google Applications which includes Google Classroom, Google Meet, Google Docs, Google Slides, Google Sheets, Google Forms and Google Sites became great tools used by both teachers and students in the distance learning set – up. Through this apps, collaboration which is a very essential part of crafting SIPs were made possible. Amidst the pandemic and distance learning set – up, quality education as mandated by the Philippine Constitution as a right of every Filipino learner must never be sacrificed. With the presence of technology, STEM students should not miss any opportunity to acquire the knowledge they need in their chosen strand and career path. With this, SIPs are collaboratively done with the use of the different Google Apps. As future engineers, scientist and movers of the society, STEM students leaned a deeper cause of their chosen career – that is to emerge as innovators amidst any situation.

METHODOLOGY

The research used purposive sampling in the study. Participants to the study are the teachers and STEM 11 students of Binan Integrated National High School. The student – participants were all members of the groups that crafted the Science Investigatory Projects and the teacher – participants participated in the implementation of SIPs as an interdisciplinary assessment and learning output for STEM 11 Students. The student - participants were purposely selected based on their modality (Blended Learning) and their capability to access the Google Apps. The teacher – participants are subject teachers teaching the students in STEM 11.

The researcher employed mixed – research design. The research aimed to describe the effectiveness of the Google apps in creating SIPs. The research also employed the quantitative research design as it conducted a survey to assess the perception of the respondents on the effectiveness of Google Apps.

The study made use of a validated survey questionnaire to assess the

effectiveness of using different Google Apps in creating Science Investigatory Projects. Mean and standard deviation was used in analyzing the data gathered from the answered questionnaire.

Most Essential Learning Competencies identified to be assessed using the Science Investigatory Project were competencies from Disaster Readiness and Risk Reduction where the concepts of the SIPs were anchored; Reading and Writing as well Pagbasa at Pagsusuri for writing research proposals and complete research papers in English and Filipino. Competencies in Practical Research and Statistics and Probability was also assessed with SIPs.

The students were also oriented on the different Google Apps that they can utilized to create SIPs together with their groupmates through the internet.

The students were able to produce twenty – five SIPs and were able to present it to the class and to the teachers.

RESULTS

The study aimed to assess the effectiveness of Google Apps in creating SIPs as an interdisciplinary assessment for Grade 11 STEM Students.

Mean and standard deviation is used to analyze the data. The eighty – five student – respondents perceived the seven google application utilized in creating SIPs were interpreted as very effective. Google Classroom ranked 1 with a mean of 3.74; rank 2, Google Meet with a mean of 3.61; rank 3, Google Forms with a mean of 3.6; rank 4, Google Site with a mean of 3.58; rank 5, Google Docs with a mean of 3.48. These Google Apps are verbally interpreted as very effective. On the other hand, Google Slides and Google Sheets ranked 6.5 with a verbal interpretation of effective. Google Slides and Google were seldom used by the students as well as they are more familiar with Microsoft Excel and Microsoft PowerPoint which are MS counterparts of Slides and Sheets. The average mean of 3.48 shows that the Google Apps are perceived by the respondents as very effective in crafting Science Investigatory Projects. In an article written by Sanders in 2016, it was said that collaborating outside the classroom is very difficult. But with technology and appropriate applications, students can collaborate on almost anything and anytime over the Internet.

Meanwhile, the five teacher participants described the seven Google Apps as very effective tools in creating SIPs. Specifically, the Google Classroom and Google Meet both ranked 1.5 with a perfect mean of 4.00. Google Docs, Google Forms and Google Sheets ranked 4 with a mean of 3.80 which is still interpreted as very effective. The Google Sites and Google slides ranked 6.5 with a mean of 3.60 being interpreted as very effective. Overall, the Google Apps, with an average mean of 3.80 is perceived as very effective by the teacher – respondents.

Two groups of participants, namely the students and teachers perceived the Google Apps with its functions in collaborative learning as effective and useful tools to utilize in creating Science Investigatory Projects as an interdisciplinary assessment. For STEM 11 Students.

DISCUSSION

The result of the study showed that Science Investigatory Projects can be used as an interdisciplinary assessment and learning output for STEM 11 Students. The

identified Most Learning Competencies are assessed through the SIPs and since five subjects collaborated in teachings and facilitating the students in developing the details of the SIPs, the burden on the part of the student of crafting different research in different subjects is being eliminated. And since the distance learning is being implemented and there is no face-to-face meetings and classes, the Google Apps are effective tools to be utilized in crafting SIPs even teachers and students are separated geographically and cannot collaborate physically, The Google Apps made it possible for every student and teacher to come up with relevant and purposeful projects.

To deliver lifelong learning takes innovation, vision and deeper understanding of the current situation. COVID – 19 pandemic and distance learning should never be a hindrance in delivering quality education. All learners deserve to get the highest quality of teaching and instructions. Furthermore, as future scientists, engineers, teachers, medical frontliners and society's gamechangers, STEM students must be exposed, facilitated, and equipped with research skills amidst changing and uncertain educational situation.

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