

Using Information & Communication Technology (ICT) to Enhance Student Engagement in Outdoor Education (OE) Lessons

1st Joel Chia
Nanyang Technological
University/National Institute of
Education
Singapore
penghwee.chia@nie.edu.sg

2nd Lim Zi Qi
Jurongville Secondary School
Singapore

3rd Muhd Al Fasha
Jurongville Secondary School
Singapore

4th Leong Yin
Jurongville Secondary School
Singapore

5th Chew Huay Huay
Jurongville Secondary School
Singapore

6th Lam Siew Leng
Jurongville Secondary School
Singapore

Abstract— The OE module was introduced as part of the Physical Education (PE) syllabus in Singapore Schools in 2014. Since the introduction of this module in our PE lessons, our PE department had explored using various strategies and tools to conduct the OE lessons more effectively so that the students could learn effectively. In this study, the use of ICT tools enabled us to give timely feedback to students, promote discussion amongst the students, as well as getting immediate results of quizzes and worksheets that are done in that particular lesson. The use of ICT helped us to consolidate and summarize the key learning points effectively, thus making the lesson more relevant to students. In this session, I would share some example of the lessons that we had conducted as well as the feedback from the students who had experienced using ICT in OE lessons.

Keywords—ICT, Outdoor Education

I. INTRODUCTION

The department started off with the conventional ways of enacting OE lessons, e.g. teacher-centred approach, direct teaching, use of pen & paper, demonstration etc. However, the feedback from the students were not positive. They commented that the lessons were boring as there were too many instructions from the teachers. Hence, the department reviewed how OE could be conducted and proposed to conduct this study as part of the Professional Learning Community (PLC) project. The use of ICT in OE lessons seems to be contradicting with the purpose of outdoor education. However, with the current generation of youths who are so comfortable with mobile devices and online platforms, perhaps using ICT tools could enhance engagement as well as improve the learning of students. In fact, the use of ICT tools is getting more common in the education landscape. Besides using ICT as a class management tool, it helps to increase participation and more importantly enhance students learning.

The purpose of this project was to study if leveraging on technology could enhance student engagement during OE lesson. The rationale for conducting this study was to address students' feedback on the low engagement during OE lessons. This was due to the lengthy instructions by the teachers during lessons such as knot tying and first aid. The students did not see the relevance of skills and knowledge that were taught. In addition, the PE teachers also shared that worksheets for the students might not be meaningful if responses were not shared, hence, proposed using technology when instant feedback could be shared during the lessons.

Taking the learners and technology outdoors will enable the learners to attain knowledge, cultivate values as well as improving their personal and social development. Learning outside the classrooms provide learners with an authentic learning experience in real-world setting. The OE lesson has also reaped benefits for the learners such as an improvement in their classroom behavior, motivation to learn and academic performance. Using technology in outdoor education could be a platform to engage the learners. The mobile devices such as tablets and smartphones will enable the learners to collect, organize, analyze and present their data more efficiently.

There are people who have negative perception about using technology OE lessons as they deem that technology is keeping the learners indoor and aiding them to lead a sedentary lifestyle. They perceive that technology is disconnecting the learners with the environment. However, technology could connect learner to the global issues and promote education related to complex and abstract concepts [1]. Using technology could lead to more engagement from the learners where they could communicate with others via video conferencing, podcasting and even acquiring knowledge through the internet. In fact, the use of mobile technology has been introduced in classroom learning and teaching. Tablet and mobile devices

enable the learners to connect to the internet to gather knowledge and information and promote collaboration among them. Using the technology has also enhanced the learning experience of the learners and has led to a greater level of engagement in activities. There is an increase in long-term knowledge retention among the learners [1].

II. MATERIALS AND METHODS

The department discussed and decided to pilot using ICT in OE lessons with all secondary two classes [3 Express, 2 Normal Academic & 1 Normal Technical] for this project over a period of 4 weeks (12 lessons) in 2017. The students from Sec 2A, 2N2 & 2T1 would be taught OE through ICT infused pedagogy while students from Sec 2B, 2C & 2N1 would be taught OE using the conventional method. This level was selected as we would be preparing them for the school’s outdoor adventure camp. The teachers were deployed as an expert for each topic such that they would enact the OE lessons to the respective classes using either the conventional method or ICT infused pedagogy.

The lessons that were enacted for this project would cover the three OE strands which is enhancing physical health and well-being, building competency in assessing & managing risk and developing sense of place. The lessons enacted were preparation for outdoor cooking, cooking a simple meal, my special place, cardinal directions and managing sprains and strains. The tools used for the ICT lessons were videos, google form, orienteering equipment, QR codes, Instagram, google+ and padlet.

III. RESULTS AND DISCUSSION

At the end of the 4 weeks, the teachers discussed and gave feedback on the lessons that were enacted using both teaching methods. The feedback from the teachers using ICT for their lessons were very positive while there were some issues with lessons enacted using the conventional methods.

The observations made by the teachers were:

Use of ICT	Conventional Method
<ul style="list-style-type: none"> • An increased in students’ engagements as the teacher played the role of the facilitator rather than an instructor. • It promoted a collaborative learning environment where students could discuss and gave feedback to each other on the work they posted online. • More time for teachers to evaluate students work as teachers were able to view students work online anytime. • Students were able to use their devices (smartphones) to google for answers to questions asked in the respective QR Codes. This encouraged the students towards self-directed learning. 	<ul style="list-style-type: none"> • Teacher demonstrated the tying of knots, however, students were not able to tie the knots correctly once they were set off to practise on their own. • Teacher took photos to document what the students did when they were doing simple bandaging during managing sprain ankle. • Students were not able to share and give feedback on the process of tasks assigned.

The teachers conducted a focused-group discussion (FGD) with 30 students to gather the qualitative feedback on OE during these 4 weeks. The feedback from the students during the FGD was that using the ICT enhanced their engagement and learning. The key responses were:

Enhanced Engagement	Enhanced Learning
<ul style="list-style-type: none"> • More enjoyable than writing on a piece of paper because most of the classroom assignments were done on paper. • Phones were portable and convenient as they were with us most of the time. • Preferred to give answers in google form as we would not lose the paper. • More engaged as we were able to comment on each other’s work using Google+, Instagram or Padlet. 	<ul style="list-style-type: none"> • Using ICT enabled us to read the instructions and get to start with the tasks quickly instead of listening to teachers giving long instructions. • The videos allowed us to learn at our own pace and we could revisit them if we forgot the procedures, eg. Tying of knots, lighting the solid fuel. • ICT enabled us to google for answers instead of asking teachers/friend all the time.

From the discussion and feedback given by the teachers and students, while using ICT did enhance teaching and learning, there were a few challenges encountered during the project. Some of these challenges were ICT infrastructure such as the network connectivity, availability of mobile devices (iPads/smart phones), individual’s ICT competency, time needed to design the lessons, checking students’ understanding of the lessons, monitoring students’ access to internet once they completed their tasks.

The teachers discussed and suggested some solutions to overcome the challenges. The proposed solutions were investing in more mobile devices (iPads) and work with the school management to install more network access points in the school so that the students could gain access to online resources easily. Students could use their personal mobile data, activating the self-marking feature in google form to check for understanding. In addition, the teachers in the department could work collaboratively to design & build up the teaching resources as well as to develop the ICT competency through sharing sessions. The department also used the Substitution, Augmentation, Modification and Redefinition (SAMR) Model by Dr Ruben Puentedura [2] to determine how the department could better design lessons using ICT to enhance student engagement in OE or PE lessons.

IV. CONCLUSION

From the discussion and feedback by teachers and students, there were evidences to indicate that using ICT did enhance the students’ engagement during the OE lessons. The department would look into resolving the challenges so that more ICT lessons could be enacted using ICT to value-add to students’ learning. The department would also use the SAMR model to improve the use of ICT in enacting the lessons.

REFERENCES

- [1] C.L. Anderson, B.G. Miller, K. Eitel, G. Veletsianos, J. Eitel, R.J. Hougham, “Exploring Techniques for Integrating Mobile Technology into Field-Based Environmental Education,” *Electronic Journal of Science Education*, vol 19, no.6, 2015.
- [2] “SAMR Model: A Practical Guide for EdTech Integration,” [Online]. Available: (<https://www.schoolology.com/blog/samr-model-practical-guide-edtech-integration>).