The use and integration of ICT in the classroom is critical for the development of students adapt to the rapid changes occurring within, not only the Digital Technologies and Technologies areas, but in wider society (Hernandez, 2017). This includes an inclusion of sustainability and developing solutions toward it. Further, the systematic and organised approach to the use of technology within the classroom is critical to the success of students and their education within the modern era (Lazar, 2015). It is, therefore, critical, that educators and administrations, are able to include new and developing technologies within the classroom to provide students with the best opportunities to either, enter the workforce or continue higher and other forms of education.

The two learning tasks selected for Part B of this assignment are Learning Task 3: Prepare an activity that focuses on learning outcomes for indigenous students Learning Task 4: Prepare and original lesson plan.

The learning outcomes for Learning Task 3 was to identify the materials and methods to construct a native beehive and choose or design a beehive to construct. The challenges for this activity, to be discussed, are the connection to local context and ensuring students understand the connections to complex multifaceted issues, whilst remaining focused on achieving a specified outcome.

The breadth of potential outcomes for this activity can be defined or limited by either the teacher or students. The aim of the activity description was to allow for the greatest number of options for the class to explore through their own discovery (Bamiro, 2015). Specifically, this area of interest can explore the design of a beehive through the use of tools such as Revit and CAD or the concept of sustainability, by using natural resources and sustainable living practices. This concept allows firstly the teacher to remain within an area that is familiar, therefore can provide suitable guidance, but secondly and most importantly, both students and teachers can explore new ideas that they were previously unaware of. This encourages a deeper more authentic learning process therefore a deeper understanding of the content and issues involved.

This activity can be used to relate to specific local contexts through the exploration of sustainability and the use of 8 Ways Learning (n.d.). This further reinforces the relevance of the content and provides another avenue to engage the learners. The continued use of European Honeybees in commercial and, increasingly, residential means, is creating potential for disease, similar to that seen overseas. The reinvigoration of the native bee improves natural ecosystem stabilisation and reduces the potential of disease outbreak in honeybees.

The learning outcome Learning Task 4 was to control and program an RPA, where students would be required to be able to manoeuvre the RPA using throttle, yaw, pitch and roll, then progress to programming the RPA to conducted automated manoeuvres. The challenges, to be discussed, are the safety architecture required to conduct these types of activities, classroom management and the progression of learning goals within the Digital Technologies curriculum.

The safety requirements surrounding the control and use of Remotely Piloted Aircraft (RPA) is complex without any prior knowledge. Although all the information is readily available on CASA websites, without some familiarity of laws, rules and regulations, surrounding the use of public airspace, this lesson or the unit of work it could be nested within would not be possible for a teacher to properly or safely deliver to a class. (Civil Aviation Safety Authority, 29 April 2021).

A preferred, and useful, qualification of a Remote Pilot Licence, is fundamental to the basic and background knowledge of this lesson and unit of work. Whilst the course is short, two days, and only addresses basic control of an RPA, it does go into significant detail to laws, rules and regulations that relate to RPA use. Further, it provides the information access so that an RPA pilot can conduct further study into the safe use of and RPA in public. If a Digital Technologies unit is built around the use of RPAs and potentially the accreditation of students with a Remote Pilot Licence, there are a number of civilian contractor solutions available, many of which currently deliver courses to Australian schools.

Classroom management is also critical to the safe operation of an RPA, particularly with students that may be more likely to display more risk-taking behaviour. The lesson plan included a detail diagram to show how the students could be placed to provide sufficient distance between and person and all RPAs. This layout is also useful as one teacher could, depending on student behaviour, manage the entire class from one location, the centre, without being to far from another group.

In order to incorporate these skills within a whole unit of work, there is a need to provide a clear progression of training for students and teachers to deliver the content. As discussed above, the simplest, for teachers and schools is to source a contracted delivery agency to conduct all lessons, provide risk management, provide all resources including RPAs and provide certification of students’ completion through the Civil Aviation Safety Authority (CASA). This is likely expensive therefore planning of delivering a unit of work like this would need approval by school administration well before its commencement and likely before commencing planning the unit.

Sustained collaborative design process. Contextualised and sustained inquiry emerges from authentic design tasks that guide the students towards a deep understanding for increasingly complex real-world problems. The principles of Design based learning, by Baran & Uygun (2016), move through a natural progression, from brainstorming ideas, reviewing artefacts, investigation, review of design principles, applying within context and collaboration within teams. The consistency and relevance of their principles and the Australian Curriculum demonstrate the continuum of learning that is relevant to 21st Century Learners. (Bower, 2017)

These concepts are particularly relevant to the activity described in Learning Task 3, where students are deconstructing and/or investigating the construction of a native beehive. This activity begins at the stage of reviewing the design of technology-integrated artefacts. During this initial stage of the lesson or unit of work, students have the opportunity to investigate the example beehive that is provided. They can also investigate through other sources, most likely through online resources, some of which will be provided. This removes the constraints that the lesson may have placed on the students to be able to explore other designs and re-design them to create their own, which engages with the principle of investigation whilst using ICT tools.

This activity further capitalises on the requirement to include contextual relevance to environmental situations, with education surrounding the native bees. It is well established that students will become more engaged with the content if they self-identify that it is relevant to their situation or circumstance or is contextually relevant. Through this activity students will also learn the importance of native bees to the natural environment and may conduct further investigation to deepen their knowledge and understanding.

The use of technology and ICT tools in the classroom is critical for the success of students’ education within the 21st Century. It is further reinforced by contextual relevance as students understand these requirements and are less likely to engage with the content when contextual relevance is not apparent. Whilst these activities provide opportunity for that relevance to be present, it is the role of the teacher to ensure that it is conveyed in that way.

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