The pedagogy of technology in outdoor learning or use of the GoPro to enhance learning and teaching.

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Aims

1. To gain insight into the decision making of students for the purpose of formative review using GoPro video footage
2. To give an opportunity for students to review their own actions individually and with a peer group using GoPro video footage
3. To give insight to educators about how their own teaching impacted on student behaviour be reviewing the GoPro video footage

Background & Rationale

The role of reflection is long established as pertinent in learning (Dewey, 1933) and the use of video feedback is known to be a useful tool in improving teaching practice (Penny & Coe, 2004). Use of video for self-assessment is embedded in other degree courses which have a significant proportion of non-classroom based education such as allied health and medicine courses. Video based self-assessment has been found to significantly improve academic performance and course satisfaction whilst increasing self-awareness of strengths and weaknesses in undergraduate nursing students (Yoo et al, 2009). Use of student self-video of performance with tutor feedback and guided reflection was found to increase students' ability to reflect and self-evaluate in physiotherapy undergraduates (Maloney et al, 2013).

This video based evidence includes thinking aloud as part of the process. Ericsson and Simon (1993) introduced the 'Think Aloud (TA)' method, which involved asking participants to continuously ' TA' and report their thoughts during the performance of a task. Ericsson and Simon (1993) emphasised the importance of TA in comparison to other methods, such as retrospective recall, due to vital information that may be lost when retrospective reports are used, for example, in orienteers who are unable to recall their route upon completion of an event. Whitehead, Taylor & Polman, 2015, undertook research into TA use in golf and found that *TA has been used frequently in research to investigate decision making in chess*

(Gobet and Charness, 2006), medicine (Ericsson, 2004, 2007), nursing (Aitken and Mardegan, 2000), Scrabble (Tuffiash, Roring & Ericsson, 2007)*, and algebra tasks (Cook, 2006)* and more recently, (Welsh, Dewhurst & Perry, 2018) found that *researchers have extended their verbal cognitive pursuits into endurance sports, such as, cycling, endurance running, as well as coaching in rugby* (e.g., Samson, Simpson, Kamphoff, & Langlier, 2015; Whitehead et al., 2016a; Whitehead et al., 2017, 2018).

Ericsson and Simon, 1993, identified three types of verbal report protocols. Level 1: verbalisation is simply the vocalisation of inner speech; Level 2: involves the verbal encoding and vocalisation of an internal representation that is not originally in verbal code. For example, verbal encoding and vocalisation of scents, visual stimuli, or movement. With this level of verbalisation, only the information that is in the participants focus is to be verbalised. Level 3: verbalisation requires the individual to explain his or her thoughts, ideas, hypotheses, or motives (Ericsson and Simon, 1993). Level 1 verbalisation was the accepted practice for this work which identified how performers thoughts are directed to managing (e.g., coping, mental strategies), continual internal and external dynamical cognitive processes (e.g., stressors) during performance (Lazarus, 1999). In a recent TA study on the real-time thought processes of distance runners, (Samson, Simpson, Kamphoff & Langlier, 2015 identified three major themes containing subthemes relating to; Pain and Discomfort (e.g., stressors), Pace and Distance (e.g., coping/strategies), and Environment (e.g., coping/ strategies). Whitehead et al. (2017) found very similar results (e.g., pacing strategies and stressors) with cyclists thought processes changing continuously and becoming more prominent at different times. (Welsh, Dewhurst & Perry, 2018)

The sport of orienteering requires the orienteer to combine both cognitive and physical components to be successful. In most orienteering events winning is achieved by being the fastest to navigate to control points in the environment.

> *The orienteer must plan a route through the environment to reach each control in the order based on the information available on the map. When planning a route from the map, the orienteer might consider factors such as distance, amount of ascent, runnability and the presence of obstacles.*
> (Eccles, Walsh & Ingledew, 2002:327)

Orienteering is a problem solving exercise based on wayfinding demonstrating *the ability to navigate effectively* (Brunyé, Mahoney, Gardony & Taylor, 2010) *in an unfamiliar environment*.(Bjerva & Sigurjónsson 2016:3) The orienteer has to solve the problem by identifying the most appropriate pathway through the environment assisted by the use of the map and compass. *The orienteer must be able to follow this route successfully from the initial state, which is the orienteer's current position, to a goal state, which is the location of the control.* (Eccles, Walsh & Ingledew, 2002:328) As teachers and coaches of orienteering, often in absence, it is the understanding of the cognitive processes that underlie expert performance at solving this complex task that is of interest. The use of the Go Pro allows both visual and oral processes to be captured and then reviewed.

Method

First year undergraduate students enrolled on the BA (Hons) Outdoor Adventure Education degree took part in this activity. The students were provided with GoPro video cameras for use on an off-site orienteering task that formed part of an Experiential Learning module. Before the students 'headed off' on their own, they took part in a number of preparatory skill development sessions to build skills, technique and confidence. This included activities within onsite familiar terrain, star events and linking a small number of controls; an introductory session in woodland with a map walk, map orientation, feature identification, distance judgement, pacing and a permanent course in pairs; followed by the opportunity to set out 'sprint' courses for each other in an enclosed wooded environment, then running these courses individually. The aim is to give students the skills and confidence to undertake full orienteering courses of a recognised Orange Standard without staff support. The students are required to work independently and are responsible for their own decision making, actions and outcomes. The cameras were worn on a head-strap enabling the students to take part in the activity hands-free and to reduce the effect on behaviour of the presence of the cameras. The GoPro video footage was uploaded and watched by staff and students both individually and amongst peers

Discussion

When analysing the video footage, both with and in the absence of the student's, analysis was undertaken against the aims of the project.

1. To gain insight into the decision making of students for the purpose of formative review using GoPro video footage

The students undertook two Orange standard orienteering courses. It was possible to undertake a formative review between courses. When reviewing the video content key areas were selected demonstrating evidence of decision making. These included:

The start: skill – map orientation; technique - folding the map, use of the start kite and speed of departure.

Feature identification: Recognition of common features. The use of language, was there use of technical terminology or not?

Distance Judgement: Was there evidence of the use of techniques to gauge distance or not?

Effect of others: Collaboration between students, there are times when they may happen upon another or others. Is this helpful or not? Is it the loudest who is heard? Map orientation? Feature identification? Technical terms?

Doubts: A lack of belief in the map, the staff and themselves.

Success: What does it feel like to get it right and in some cases be surprised you have it right!!

Prompting the formative review with questions gave greater focus to the purpose of the review. Students were able to follow the progress of themselves or others with the aid of the map and knowledge of the course.

2. To give an opportunity for students to review their own actions individually and with a peer group using GoPro video footage

One example of this is where a student became misplaced on a course that all students had undertaken. The student took seventeen minutes to complete controls 1 to 6 and then a further seventeen minutes to complete controls 6 to 7, a distance of 200m. There was a considerable error in feature identification, disbelief in the map, disbelief in the compass and disbelief in self, until a decision was made to stop, and a significant feature was identified. In addition to the problem solving skills demonstrated the student demonstrated

great tenacity and resilience to continue. This allowed a discussion related to the navigation processes in map reading or way finding. *Orienteering requires visual attention to three sources of information: the map, the environment and travel*. (Eccles, Walsh & Ingledew, 2006:77) As a novice orienteer it was evident that the student was stopping frequently to pay attention to the map and identify features. At the time they became misplaced they were not using the techniques of distance judgement, pacing for absolute distance or the simpler map orientation based on the compass. This led to confusion and an error in judgement. On eventual correct identification of a significant feature there was evidence of much relief, frustration and anger. The student 'dug deep' problem solved their situation and continued on the course retracing their steps to their last known point. This demonstration of successful problem solving, resilience and tenacity has much to commend it and these aspects of personal performance have further research potential.

3. To give insight to educators about how their own teaching impacted on student behaviour by reviewing the GoPro video footage.

Alongside the students' staff were also able to review the video footage to evaluate the strengths and weaknesses of the students and their teaching.

The general outcomes were that staff gained a valuable insight into how students were performing in the task and how students were making decisions when operating alone and in groups. It was possible to observe common limitations in students grasp of the basic skills and techniques, the decision making process in the experiential learning task and how quickly some students became fatigued. These observations enabled a review and targeting of future teaching accordingly. One particular theme which stood out was that of confidence. The students often lacked confidence in the map, the staff and themselves.

Upon evaluation of the taught sessions some changes were made such as: getting out into woods quicker, increased map walks with feature identification, pairs work and good practice video footage such as distance judgement and pacing. The student comments supported by the video footage confirmed the positive use of a small contained arboretum to develop skills akin to a star course with a 6 control loop.

Summary

Reflecting on this in class research it is evident that the GoPro video camera proved to be an excellent tool to enhance teaching and learning in the experiential learning module. Use of the head-strap allowed students to 'forget' the presence of the camera and behave authentically when engaged with the orienteering task; producing rich video data for both students and staff to review. This promoted reflexive teaching practice in staff and reflective learning in students.

Recommendations can be made for wider inclusion of the GoPro video camera in the early stages of the BA (Hons) Outdoor Adventure Education degree to enable students to develop their reflective skills at the inception of their degree course. Review of the video footage should be used as formative feedback for both the skill development of students and the facilitation of reflexive teaching practice. This in turn can develop metacognition and quality reflective practice that is critical, analytical, dialectical, creative and inquiry based for students to become more affective learners and reflective practitioners to support continuous professional development.

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