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Introducing the use of a semi-structured video diary room to investigate students' learning experiences during an outdoor adventure education groupwork skills course

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DOI:

[10.1007/s10734-013-9645-5](https://doi.org/10.1007/s10734-013-9645-5)

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Document Version

Peer reviewed version

Citation for published version (Harvard):

Cooley, SJ, Holland, MJG, Cumming, J, Novakovic, EG & Burns, VE 2014, 'Introducing the use of a semi-structured video diary room to investigate students' learning experiences during an outdoor adventure education groupwork skills course', *Higher Education*, vol. 67, no. 1, pp. 105-121. <https://doi.org/10.1007/s10734-013-9645-5>

[Link to publication on Research at Birmingham portal](#)

Publisher Rights Statement:

A definitive version was subsequently published in *Higher Education*, July 2013. DOI: <http://dx.doi.org/10.1007/s10734-013-9645-5>. The final publication is available at link.springer.com.

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1 Running Head: VIDEO DIARY ROOM DURING GROUPWORK SKILLS COURSE

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4 Introducing the use of a Semi-Structured Video Diary Room to Investigate Students' Learning
5 Experiences during an Outdoor Adventure Education Groupwork Skills Course

6

7 Sam J. Cooley, Mark J. G. Holland, Jennifer Cumming, Emily G. Novakovic, and Victoria E. Burns

8

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9 **Author note**

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11 All authors, School of Sport and Exercise Sciences, University of Birmingham at Birmingham, UK.

12 This project received funding from the Higher Education Academy, University Birmingham Sport
13 (UBS) and the College of Life and Environmental Sciences at the University of Birmingham. Although the
14 outdoor education centre is funded by UBS, the research was designed, conducted, analysed and written by
15 independent staff; the other funding sources had no direct involvement in the research or preparation of this
16 article. The authors would like to thank manager Norman Beech and his team at the Raymond Priestley Centre
17 for their cooperation, along with Liam Deery and Tonia Horgan for their assistance with data collection.

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22 Date Submitted: 23/02/2013

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24 Word count (including figures/tables/references): 6942

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34 Abstract

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36 Outdoor adventure education courses are used in higher education to develop transferable skills such as
37 groupwork and problem-solving skills. There is a need for exploratory investigation into students' perceptions of
38 this experience. This study aimed to develop an innovative qualitative data collection method, and to use it to
39 explore students' perceived learning processes and developmental outcomes when taking part in an outdoor
40 groupwork skills course. Participants (n = 40) were undergraduate engineering students who were taking part in
41 the 3 day residential course as part of their degree course. Students' experiences were captured whilst immersed
42 in the course, using a semi-structured video diary room. Participants entered the diary room at different time
43 points throughout the course and responded to open-ended questions. Following a thematic analysis, students
44 were found to arrive on the course with mixed feelings towards groupwork and expected learning outcomes.
45 Activities were enjoyable yet challenging, revealing students' weaknesses and demanding a range of skills and
46 coping methods. The outdoor environment added novelty, risk and natural consequences. Students reported
47 developing a range of skills in groupwork, adaptability, persistence, planning, problem-solving, time-
48 management, communication, leadership, cooperation, group reflection and team spirit, as well as benefits to
49 physical activity, self-confidence, self-awareness, peer and staff relationships and internationalisation. These
50 findings provide a base for future investigation into the long-term impact on student development and skill
51 transfer. The semi-structured video diary room yielded rich data, contributing to the literature by offering a
52 simple, yet effective, qualitative research method that can be implemented in a variety of contexts.

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65 **Introducing the use of a Semi-Structured Video Diary Room to Investigate Students' Learning**
66 **Experiences during an Outdoor Adventure Education Groupwork Skills Course**

67 Developing transferable skills in groupwork, problem-solving, task management and leadership can
68 enhance student success during higher education (Prichard, Bizo, & Stratford, 2006). Graduate employers often
69 value these skills over technical knowledge and degree classifications (Branine, 2008; CBI, 2009), although they
70 are not always sufficiently developed in graduates (Athiyaman, 2001; Bennett, 2002; CBI, 2011). Universities
71 have been criticised for focusing on academic ability and didactic teaching methods, leaving the development of
72 emotional and behavioural skills to chance (Buller & McEvoy, 1990; Roberts, 2009). In response, some
73 institutions provide outdoor adventure education (OAE) courses with the aim of developing these transferable
74 skills (Buller, McEvoy, & Cragun, 1995; Elkin, 1990; Steiner, Arthur, & Beech, 2008). OAE involves small
75 groups placed in a wilderness setting to complete group problem-solving activities that require intense group
76 interaction and facilitation (Hattie, Marsh, Neill, & Richards, 1997).

77 In higher education, OAE has been shown to improve decision making, communication, group
78 cohesion, self-awareness, social support, self-confidence, resilience, leadership and interpersonal skills
79 (Breunig, Connell, & Young, 2010; Ewert & Yoshino, 2011; Gass, Garvey, & Sugerman, 2003; Kass &
80 Grandzol, 2011; Mazany, Francis, & Sumich, 1997; Sibthorp, 2003). Although these findings are promising,
81 there are number of limitations within this literature.

82 Firstly, research includes long *wilderness programs* lasting several weeks. This type of OAE usually
83 involves expeditions (e.g., sailing and mountain climbing) with unstructured learning processes and outcomes
84 (Mazany et al., 1997). However, due to financial and time constraints, institutions often provide more time
85 efficient *outdoor-centred* courses lasting two to five days (Steiner et al., 2008; Wagner, Baldwin, & Roland,
86 1991). Students typically stay at an outdoor pursuits centre and take part in structured group problem-solving
87 activities (e.g., ropes courses and raft building) aimed to develop specific interpersonal and task management
88 skills (Steiner et al., 2008). Less research has focused on outdoor-centred courses in higher education and, as
89 these courses tend to be shorter and more structured, findings from wilderness programs may not generalise.

90 Secondly, research has focused on the effects of OAE on intact groups. For example, students reported
91 an increase in their groups' communication and decision making ability following a 4 day course (Mazany et al.,
92 1997). Whilst valuable, evaluations should also address whether individuals develop more transferable skills
93 benefitting them in the future, beyond their current group.

94 Finally, studies are limited by the use of questionnaires measuring a narrow range of course outcomes.
95 Retrospective recall within questionnaires is also subject to recall bias, often leading to inaccurate accounts of
96 an experience (Tanur, 1994). Consequently, these assessment methods may have restricted the scope of
97 investigation to what the researcher expects to find, rather than exploring the experience more broadly, through
98 the eyes of the participant. As a result, the full range of course outcomes, and the processes students go through
99 to reach these outcomes, may not be revealed. Qualitative methodology should provide this richer, broader and
100 less restrained understanding of the experience (Howitt, 2010).

101 **The Present Study**

102 This study investigated undergraduate students' learning experiences during a 3 day outdoor-centred,
103 groupwork skills course. Whilst this course is employed to develop undergraduate and postgraduate students'
104 groupwork skills across a range of disciplines, including arts and law and the life, environmental, physical and
105 social sciences, this study focuses on its use in engineering. The aim was to understand students' perceptions of
106 the experience and the range of course outcomes, while students were immersed in the course. To achieve this
107 aim, we developed an innovative qualitative measurement tool, namely a semi-structured video diary room.

108 **Video Diary Room**

109 Inspired by reality television programs, video diary rooms have been used within educational, health
110 and corporate sectors to evaluate learning experiences (Poole, 2007), conduct service evaluations (NHS North
111 West, 2010), and evaluate staff training and gather customer feedback (Cliff Productions, 2012). A video diary
112 room involves momentarily taking participants out of an experience, and into a private space, to reflect verbally
113 on that experience in front of a video camera. This approach overcomes difficulties people face when expressing
114 themselves through written diaries (Punch, 2002). However, video diary rooms have not been widely used as a
115 qualitative method in scientific research. To the authors' knowledge, only two peer-reviewed publications have
116 previously implemented a form of video diary room methodology.

117 Noyes (2004) used a video diary room, alongside face-to-face interviews, to investigate children's
118 learning dispositions. The diary room offered an increased depth and freedom of speech and less reliance on the
119 rapport between researcher and participant. A video diary room method was also used by Buchwald, Schantz-
120 Larsen, and Delmar (2009) to investigate children's experiences during various life-changing situations.
121 Participants were each given a video camera and asked to record their own entries over a period of time. Similar
122 to the approach used by Noyes, participants were allowed the freedom to discuss anything within a broad theme
123 that was given to them before entries commenced. Buchwald and colleagues considered the video entries to be a

124 “useful supplement to more conventional methods... capable of eliciting data that would not otherwise be
125 obtained” (p.12).

126 Despite these strengths, both studies highlighted limitations with their methods, ranging from practical
127 issues such as ensuring entries were made at critical time points, to issues that may have compromised the
128 credibility and trustworthiness of the results. For example, participants avoided entries during negative
129 experiences and the pre-planned nature of the entries allowed participants time to consider what they felt would
130 be an appropriate response, increasing the likelihood of social desirability bias. In addition, without having
131 questions for participants to follow during entries or an interviewer present, discussion went off track and
132 resulted in large amounts of irrelevant responses (e.g., playing up to the camera) unrelated to the question
133 addressed by the study.

134 In contrast, the present study used semi-structured questioning, similar to that employed in more
135 conventional qualitative techniques. This approach allows a researcher to direct responses to an area of interest,
136 whilst still giving the respondent flexibility to construct their personal view of an experience (Smith, 2009).
137 Additionally, the present study invited different participants to give diary room entries at various time points and
138 during different observed experiences, thus ensuring spontaneity and variety in responses. Both Noyes (2004)
139 and Buchwald et al. (2009) followed the same participants over time and found entries to increase in depth as
140 participants became more comfortable in front of the camera. It is of interest as to whether a single participant
141 entry approach will still lead to rich data. Finally, as Noyes and Buchwald used a diary room method with
142 children, this study explored whether students in higher education displayed the same openness when sharing
143 their experiences in front of a camera.

144 In summary, the aim of the present study was to explore the learning experiences of higher education
145 students taking part in a 3 day groupwork skills course, using a semi-structured video diary room.

146 Method

147 Participants

148 Twenty nine participants were recruited from a population of 100 Mechanical Engineering (BSc, year
149 three) undergraduate students, who were taking part in a short OAE course. An additional 11 participants were
150 recruited from a population of 106 Electronic, Electrical and Computer Engineering (BSc, year two)
151 undergraduate students, who were also taking part in OAE, resulting in a total of 40 participants (mean age =
152 20.55 (SD = 1.09) years). The majority were male ($n = 32$), and were a mixture of home/EU ($n = 22$) and
153 international ($n = 18$) students; about half ($n = 21$) spoke English as their first language. All of the students were

154 scheduled to take part in a group project module when returning to university following OAE. However, before
155 OAE, students reported limited groupwork experience and had not received any formal groupwork skills
156 training within their degree course. Approval for conducting the study was granted by the University's Ethics
157 Committee.

158 **Outdoor-centred Course**

159 The 3 day residential course was held at a University-owned outdoor pursuits centre in the North West,
160 UK. The course aims to develop transferable skills in groupwork, communication and group problem-solving.
161 Iterations of the course were attended by 30 to 36 students, who were randomly organised into groups of 6 to 8.
162 These groups participated in outdoor problem-solving activities throughout each day. The activities were
163 facilitated by trained instructors who observed the groups' progress and led regular reflective discussions.
164 Activities progressed from 30 minute 'ice breakers', such as reaching a marker across a rough terrain whilst
165 blindfolded, to more complex activities, such as raft building and ropes courses. All activities required the group
166 to work together to complete objectives. In addition, they were issued with a group housekeeping rota, and there
167 was time off in the evenings to relax and socialise.

168 **Semi-Structured Video Diary Room**

169 A semi-structured video diary room was set up in a private yurt. The room contained a digital video
170 camera (Sony DCR-SX33) positioned in front of a chair, with question cards laid out on a table (Figure 1).
171 Decorative lighting and coloured screening created a more enjoyable and relaxed atmosphere.

172 (Figure 1 & Table 1)

173 Diary room questions were independently developed by four researchers, and were refined following
174 group discussions. The final questions (Table 1) were independently reviewed for quality and clarity by an
175 expert qualitative researcher. Questions were deliberately broad and open-ended to ensure participants were not
176 led to a particular answer and required more than a "yes/no" response (Smith, 2009). Responses were guided
177 towards students' perceptions of the course experience, as well as their personal development and perceived
178 benefits beyond the immediate group dynamics. There were three sets of questions, each corresponding to a
179 specific time point during the course. A warm-up question was used to relax participants and encourage a
180 greater depth in answers. Researchers viewed the initial entries for each time point to ensure the questions were
181 understood as intended; all entries were later included in the analysis as no such misunderstandings were
182 observed.

183

184 Procedure

185 Students were invited in person by researchers to give entries. Purposive sampling was used to ensure
186 the deepest possible understanding of the experience (Hastie & Hay, 2012), whereby the researchers invited a
187 range of participants to represent the diversity observed within the wider population; for example, those who
188 displayed varied course experiences (e.g., enjoyment, success/failure), apparent personality types (e.g.,
189 extroversion and introversion), and demographics. Forty-six students were invited into the diary room, with six
190 (13%) declining to take part due to an unwillingness to be recorded. This refusal did not appear biased towards
191 students with any particular characteristics.

192 Each participant was given an information sheet, consent form, and demographic questionnaire. Before
193 being left alone in the room, participants were instructed to read each question aloud, take their time, answer in
194 as much depth as deemed necessary, and to leave out or revisit questions if needed. After making their entry,
195 participants were asked to inform the researcher if they were unhappy with their comments, or if they would like
196 to make any additions; neither event occurred.

197 Analysis

198 Forty diary room entries were collected over four iterations of the course; 12 on arrival, 16 during, and
199 12 at the end of the course. The duration of entries ranged from 63 sec to 10 min 49 sec ($M = 4$ min 8 sec, $SD =$
200 2 min 21 sec), resulting in a total of 2 hr and 45 min of recording.

201 An inductive thematic analysis was used because of the exploratory nature of the study. This approach
202 provides a rich and descriptive account of patterns within the data set, with identified themes being strongly
203 linked to the data itself, rather than fitting to a pre-existing theory or framework (Braun & Clarke, 2006; Howitt,
204 2010). A semantic, realist approach was taken, whereby participants' experiences and personal meanings were
205 analysed using an explicit interpretation of what was said, rather than looking for underlying meanings and
206 structures (Braun & Clarke, 2006).

207 To increase systemisation and transparency, guidelines provided by Braun and Clarke (2006) and
208 Howitt (2010) were followed. Step 1 involved data familiarisation. Although professional transcription services
209 were used, the lead researcher watched, read, checked, and re-read all entries. In Step 2, initial coding was
210 carried out using qualitative analysis software (Nvivo 9). Each sentence, or small section of text, was given a
211 descriptive code one level of abstraction away from the data. No new codes were created in the final transcripts,
212 suggesting saturation was approached. Themes were identified as the process naturally evolved into Step 3,
213 involving the sorting of codes into themes. Tentative themes were further organised into higher and lower level

214 themes. In Step 4, themes were reviewed to ensure there was enough supporting data and both *internal*
215 *homogeneity* and *external heterogeneity* existed (Patton, 2003). This process resulted in themes being removed,
216 merged or divided. In Step 5, names and definitions were given to each theme. Theme names were selected
217 based on words from research, theory, and terms used by participants (Hastie & Glotova, 2012).

218 To improve credibility and trustworthiness, a second researcher independently coded 15% of the data,
219 before themes were discussed and refined until consensual validation was reached. Finally, the entire data set
220 was presented to two expert researchers who were independent of the analytic process; more refinements were
221 made at this stage before being agreed.

222 Results

223 The following results are organised into two distinct but related areas of interest - the *course*
224 *experience* (e.g., a collection of themes describing the process students went through during OAE) and the *course*
225 *outcomes* (e.g., a collection of themes describing the perceived learning outcomes that resulted from the
226 experience) (see additional online information for the full set of themes and definitions).

227 The Course Experience

228 Students described their feelings towards the course and their learning experiences in great depth. Five
229 first level themes were discussed, including students' preconceptions about the course, their expected course
230 outcomes, meaningful elements of the course, how they overcame challenges, and their affective and
231 instrumental attitudes towards the course. These five themes together comprised 21 second level themes and 52
232 third level themes (Table 2). In the following sections, sub-headings are used to identify each of the first level
233 themes and the associated second level themes (italicised) are described along with the third level themes and
234 examples of supporting quotes.

235 (Table 2)

236 **Individual preconceptions.** On arrival, students brought with them a number of different attitudes and
237 feelings towards their participation in the course. These preconceptions included different types of *motivation*
238 *for attending*. Some students attended simply because it was a compulsory part of their degree course, whereas
239 other students attended in preparation for future project work. Students displayed *positive affect* by conveying
240 excitement towards the course. However, students had mixed *preferences for groupwork*, with some responding
241 positively and others stating a preference for independent working. Students had received prior *information from*
242 *peers* that influenced their preconceptions, including what to expect from the activities. Some had previous
243 experiences of OAE: "I've done something similar to this in school... I'm pretty sure I know what's going on

244 and what sort of tasks we'll be doing.", whilst others had none. Students also expressed *concerns* relating to
245 personal safety, the environment, physical exertion, being amongst others and a lack of pre-course information.
246 For example, "My main concern would be whether I get on with my team mates because if I didn't, I'd find it
247 quite a hard, hard couple of days." Other students had no concerns.

248 **Outcome expectations.** Students expectations ranged from high, "We have got a lot to learn on this
249 course," to low, "To be honest I don't think I'll learn much". Many expected to develop *groupwork skills*, such
250 as cooperation, leadership and communication. Students also expected the course to provide *enjoyment*, and lead
251 to *improved peer relationships*. Finally, the course was expected to *benefit future behaviour*, at university and in
252 future employment.

253 **Key elements of the experience.** During the course, students repeatedly discussed elements of the
254 experience that stood out to them as being particularly meaningful and/or contributing to the course outcomes.
255 The activities themselves were often described as *interesting and enjoyable*. *Challenging* elements of the
256 experience were reflected in five third level themes: (a) physically demanding, (b) intellectually demanding, (c)
257 language barriers, (d) frustrating, and (e) sometimes unachievable, allowing teams to experience failure.

258 Another key element of the experience described how activities *revealed weaknesses*, both individually
259 (e.g., "...it was a bit slow, but that was due to two or three people not being particularly confident.") and as a
260 group (e.g., "...no one was really listening to each other"). A fourth key element was the *environment*; some
261 found the novelty memorable and others described a sense of risk, which was exciting and helped to foster a
262 supportive group environment as this student explains:

263 The prospect of falling with a harness on you... Individuals would have to be looked after by the rest of
264 the team, which was good because you have to rely on your team mates to actually stop you from
265 falling.

266 The environment also provided natural consequences, for example, "...we think and make a boat, but it doesn't
267 work, it didn't work because we didn't work well and we didn't think well so we fall in the sea".

268 The final element of the course experience was the contribution of *time outside of activities*. This
269 student explains the importance of having duty rotas:

270 If we were not given a duty rota or anything, the place would rapidly descend into just rubbish and
271 chaos... it is good to start thinking about what is necessary in a business or an environment like that in
272 order to keep things running smoothly...

273 Whilst another student illustrates the importance of free-time outside of structured activities, “I think the most
274 meaningful experience has been last night’s social... the whole of our team went along. We all had a really good
275 laugh just sharing experiences...”

276 **Overcoming the challenge.** To overcome challenges posed by the course, students used interpersonal
277 and intrapersonal coping methods. *Interpersonal support* was gained from interacting with others and comprised
278 seven third level themes: (a) groupwork (e.g., “My teammates, they are quite skilled in these kinds of things
279 [outdoor pursuit activities]... I learned a lot from them”), (b) leadership (e.g., “Because I have done [raft
280 building] before I proposed idea and we went with it and it worked really well”), (c) communication (e.g., “We
281 did take it in turns to, to voice opinions and ideas in order to overcome each obstacle”), (d) role allocation (e.g.,
282 “We chose people who maybe had much better balance to carry the water¹ and the other two to support.”), (e)
283 trust (e.g., “You are blind folded and you have to trust the other team member to climb up the wall.”), (f)
284 humour (e.g., “A bit of humour has certainly helped me to overcome a few things.”), and (g) instructor support
285 (e.g., “The people that are taking us are really, really friendly, really helpful, quite insightful about stuff. They
286 realise where certain weakness are and strengths are in the group”).

287 *Intrapersonal support*, was gained from within the self and comprised five third level themes: (a)
288 application of previous knowledge (e.g., “Some of my sailing knowledge about knots came in handy.”), (b)
289 emotional control (e.g., “...I have had to keep my head cool.”), (c) improvisation (e.g., “Improvisation happened
290 quite often, especially because we were trying to do things quickly...”), (d) reflection (e.g., “Reflection upon
291 how things have gone in the past have helped me to look to difficulties in the future...”), and (e) planning (e.g.,
292 “Trying to kind of foresee difficulties and overcoming them before they get to them”).

293 **Reflection on the experience.** On the final day, students reflected on the course as a whole. Many felt
294 they had a *positive and memorable experience*, represented by quotes such as, “It was a good experience and
295 memories will stay forever.” and, “Well, in a nut shell, the best experience of my life”. The experience also
296 *exceeded expectations* (e.g., “Honestly I thought it was going to be an inconvenience but, I liked it... it was
297 good”) and provided a *sense of achievement* (e.g., ...we got out there and it worked... that was really great to see.
298 I really, really enjoyed that). Finally, the end of course feelings included *thoughts on transfer*, with students
299 anticipating how the experience might be useful in the future, “...I’m in a group with these people and if nothing
300 else, I have a project to do with them in March.” and, “It is good to start thinking about what is necessary in a
301 business”.

302 _____

303 ¹ In one activity, students were required to carry containers of water across an obstacle course without spilling.

304 **The Course Outcomes**

305 Students discussed a broad range of outcomes as a result of attending the course. The analysis revealed
306 23 third level themes, which were categorised into seven second level themes, and further categorised into two
307 first level themes of *interpersonal* and *intrapersonal* outcomes (Table 3). The following sections describe the
308 interpersonal and intrapersonal outcomes in turn, with their corresponding second level themes italicised.

309 (Table 3)

310 **Interpersonal.** Interpersonal outcomes involve how an individual interacts with others. This first level
311 theme included three second level themes: *groupwork*, *improved relationships* and *internationalisation*. By the
312 end of the course, students displayed an increased awareness of the value of *groupwork* and reported developing
313 seven different *groupwork* skills: (a) communication, which involved an increase in communication skills (e.g.,
314 “Number one definitely, it improves my teamwork, my communication skills with other people”), listening
315 skills (e.g., “I learnt to listen to others, not always listen to myself.”) and students’ understanding of the
316 importance of effective communication, for example:

317 It has become very clear that some people do not like to voice their opinions... I think a team does need
318 people like that so that they can come up with the ideas but they still need someone to put them across.

319 (b) leadership skills, which included having a better understanding of the qualities associated with a successful
320 leader (e.g., “You are more likely to work for somebody if you are enjoying their company...”), and developing
321 one’s leadership style (e.g., “I feel that I can be a bit overbearing...”); (c) team spirit, with students expressing
322 that they learnt how to foster a supportive team environment through trust, self-sacrifice and motivating others;
323 (d) group reflection, comprising an increased ability to reflect ‘in action’, where it was “useful to step back and
324 look at a situation sometimes”, as well as reflecting ‘on action’, for example, “...being able to reflect on what
325 we’ve done, brainstorm what would have been better”; (e) understanding of team roles, with one student
326 learning that “...every organisation is a special structure, just like a successful group needs some leaders and
327 thinkers and doers, as well as the carers”; (f) cooperation, involving the ability to compromise and work with
328 others cohesively. One student stated “[the course] taught me to be a bit more accepting, understanding sort of
329 like appreciating what other people’s views are”, whereas another learnt “... not to undervalue anyone”; and (g)
330 functioning of intact groups, which describes the perceived benefits to groups who were returning to university
331 to continue working together.

332 Students described *improved relationships*, which included peer group relationships, where new
333 friendships were developed between students; one student said, “Before coming here, I had about ten friends,

334 twelve friends from the school. Now I almost know everyone by name”, whilst another described increased
335 social support, “I meet some new friends. When I’m in school, I meet some difficulties or problems, I can ask
336 them for help”. Improved relationships also included those between student and staff, where one student said,
337 “They really care for us and are here to help us... Our relationship was just entering the lecture, taking some
338 information, getting out. Now I know them personally, they are very good guys”.

339 The final second level theme within the interpersonal outcomes was *internationalisation*, defined as
340 promoting, valuing and learning to work effectively in multicultural environments. This theme benefitted home
341 and international students alike and included internationalising groupwork, involving a change in cultural beliefs
342 and norms regarding groupwork. An overseas student explained, “In China I usually have fewer time, or fewer
343 chance to cooperate with others. We usually study by ourselves... I have found that teamwork is very
344 important”. Other third level themes included overcoming multilingual challenges and increased cross-cultural
345 integration; this student spoke of both:

346 There is some people on this course that have been in every lecture I have sat in for two years that I have
347 never heard them utter a single syllable and I don’t really know if they speak English. And in the last two
348 days I have had to get them to communicate with me somehow and some of their English is really poor
349 but, I’ve had to make it work... I think there is segregation in our year and it’s wrong and it would be nice
350 to break it down a bit more.

351 **Intrapersonal.** Students reported a range of intrapersonal outcomes, which were defined as outcomes to
352 do with the self. This first level theme included four second level themes: *mental toughness*, *task management*
353 *skills*, *self-awareness* and *physical activity*. Within the theme *mental toughness*, students spoke of an increased
354 capacity to deal with challenges, including (a) persistence in the face of difficulty (e.g., “I learnt to never give
355 up. I know no matter what happens in academic work also in life and maybe work in future, we will meet a lot
356 of difficulties but to make sure we never give up”); (b) increased self-confidence (e.g., “I become more
357 confident about myself. I usually speak to myself that you can do it... because you have the ability”); (c)
358 learning to be brave despite low self-confidence (e.g., “There is just one girl in our team... if I can’t do it our
359 team will fail... So I think being brave is the most important thing I learnt”); and (d) adaptability, (e.g., “We
360 should be adaptable to any situation”).

361 Increased *task management skills* included improved planning skills and understanding of the importance
362 of planning. One student said, “We just dived into challenges... we did not use planning time efficiently, so,
363 don’t be afraid to use all the time and all the resources you have got”. Students also developed problem-solving

364 (e.g., “I learnt how to think by myself and use my knowledge in practice to solve my problem.”), and time
365 management skills (e.g., “...time management... really struck through... It taught us to keep an eye on the time”).

366 The next intrapersonal outcome was increased *self-awareness*, where students became more aware of their
367 own strengths and weaknesses and highlighted areas requiring continued improvement. For example, “I find it
368 very difficult not to snap at people... I wasn’t aware of that... Probably rein that in a bit” and, “I don’t listen to
369 anyone, I just do what I am thinking”.

370 Finally, intrapersonal outcomes included benefits to *physical activity*. The course provided an immediate
371 bout of exercise, with some students having gone “a long time without exercise”, as well as teaching outdoor
372 recreation skills such as personal survival, knots and map reading. Students also reported an increased
373 motivation to take part in new sports, for example, “I really liked it, maybe I will continue the rowing in the
374 future” and to increase future physical activity; for example, “I think after I go back from [the course] I will not
375 be lazy anymore”.

376 **Discussion**

377 The aim of the study was to investigate students’ learning experiences during a 3 day outdoor-centred
378 groupwork skills course. The depth of student response to the semi-structured video diary room revealed a
379 complex range of themes. Divided into two separate thematic maps, students discussed the learning process they
380 experienced during OAE (*the course experience*) as well as the range of outcomes resulting from their
381 experience (*the course outcomes*). The following discussion is organised around each of the resulting themes in
382 turn.

383 To begin with, students arrived at the centre with varied motivations for attending; some valued
384 groupwork and hoped to develop their interpersonal skills, whilst others were unsure why they were attending
385 and displayed negative attitudes towards groupwork. This variation may be because the course is embedded into
386 the degree course, rather than an optional addition. Whilst some students expected to develop groupwork skills,
387 many saw the course as a social event. Overall, the range of expected course outcomes on arrival, were far
388 narrower than the subsequent outcomes described in later entries. This disparity could represent an ‘unconscious
389 incompetence’ state in many students, which is described in the conscious competence learning model as being
390 unaware of a lack of knowledge or expertise within a given area (Adams, 2012; Flower, 1999). Despite the
391 engineering discipline placing a particularly high demand on the development of groupwork skills in graduates,
392 many students were unaware of the different areas of interpersonal and emotional development considered
393 important in higher education and employment (Athiyaman, 2001; Bennett, 2002; Branine, 2008; Prichard et al.,

394 2006). By the end of the course however, students appeared to have progressed to the ‘conscious incompetence’
395 and ‘conscious competence’ stages of the learning model, displaying greater awareness of areas in need of
396 improvement as well as increased competence in these areas. This finding supports the argument that students’
397 ability to work well in groups is not effectively developed without direct intervention (Prichard et al., 2006), as
398 students appear to have a superficial knowledge of the different interpersonal skills that could be improved. In
399 addition, this finding suggests that the outcomes of OAE discovered in engineering students, may generalise to
400 other disciplines. In a discipline that places less emphasis on the importance of groupwork skills, students would
401 still be likely to begin OAE with similar beliefs and understanding to those in the present study. However,
402 further research should include other disciplines to confirm this expectation.

403 This pre-course lack of awareness and negative attitude towards groupwork is also an important area
404 for course improvement. Students’ pre-course attitudes towards groupwork have previously been found to
405 significantly relate to post-course measures of perceived group effectiveness, supportiveness, and continuation
406 of groupwork when returning to university (Shivers-Blackwell, 2004). Further, according to behavioural change
407 theories such as the theory of planned behaviour (Ajzen, 1991), the likelihood of an individual changing a
408 behaviour (e.g., groupwork) is predicted by the individuals’ intention to change this behaviour. Intention is in
409 turn predicted by attitude, perceived social norms, and perceived behavioural control over the behaviour.
410 Therefore, the development of behavioural skills could be enhanced by targeting these areas prior to students
411 attending a course.

412 Other key areas of the experience were the activities, which students found interesting and enjoyable,
413 yet challenging, revealing individual and group weaknesses. Students were motivated by perceived risk and
414 natural consequences to failure, resulting from the outdoor environment. These findings support previous studies
415 where participants have recalled the unfamiliar and challenging outdoor environment as a vital part of the
416 learning experience (D’Amato & Krasny, 2011; McKenzie, 2003). It is believed that this type of environment
417 provides optimal levels of arousal for learning to occur, as students are alert and engaged (Priest & Gass, 2005).
418 The environment also promotes transformative learning, encouraging students to think about things in a
419 different way and seek support from those around them (Mezirow, 2000; O’Sullivan, 2002). In the present
420 study, the challenges faced required students to work together and utilise a range of coping methods, many of
421 which were reflected in the subsequent learning outcomes.

422 In addition to the activities, time outside of activities was also found to be important. Some students
423 found the house keeping rotas and living arrangements just as effective in developing groupwork skills as the

424 activities themselves. The free-time was also important for socialising and bonding, allowing students to
425 practice their interpersonal skills and explore new social networks. This finding is particularly interesting as
426 some researchers have suggested that to save travel costs, group problem-solving courses could be conducted
427 indoors on campus and achieve similar outcomes (Broderick & Pearce, 2001). However, this study highlights
428 the importance of a novel and unpredictable outdoor environment and the time spent living and socialising
429 together outside of the structured activities. To maximise the social benefits, organisers should be encouraged to
430 randomly assign students both to their small groups and to different iterations of a course, rather than allowing
431 students to sign up in friendship groups.

432 Students reported developing key skills, such as adaptability, communication, groupwork, leadership,
433 self-confidence, persistence, time management, problem-solving and planning, all of which appear repeatedly in
434 the literature as crucial for both success in higher education and subsequent employment (Bennett, 2002;
435 Prichard et al., 2006; Roberts, 2009; Stevens & Campion, 1994). Not only did students report developing their
436 ability across these areas, many demonstrated increased awareness of what effective groupwork involves and the
437 value in working with others. Although some of these outcomes have been found in previous literature (for
438 reviews, see Ewert & McAvoy, 2000; Gillis & Speelman, 2008; Hattie et al., 1997; Williams, Graham, & Baker,
439 2003), this study is the first to demonstrate such a range of outcomes following a short, outdoor-centred course
440 used in higher education.

441 Another interesting outcome was internationalisation, where students learnt to work in
442 multicultural groups and overcome the associated language barriers. This development is vital in an increasingly
443 globalised economy, with workplaces requiring graduates who can navigate language and cultural differences
444 and work effectively in multicultural groups (Roberts, 2009). This study is the first to demonstrate the potential
445 for OAE in providing this type of development. Future research should further explore these multicultural
446 benefits, including whether outcomes persist on return to university, and whether different nationalities or
447 cultural groups experience and benefit from OAE in different ways.

448 In summary, this study provides support for OAE in higher education, demonstrating a wide range of
449 positive outcomes, achieved during a short outdoor-centred course. In addition, the groupwork skills developed
450 were not specific to the intact groups taking part and instead demonstrate individual development that may
451 benefit students when entering various group environments. However, while this study outlines a range of
452 outcomes that may potentially transfer to future experiences, further research is required to explore the long-
453 term impact on student development and employment.

454 As a secondary objective, this study developed a qualitative method of data collection that successfully
455 captured students learning experiences whilst immersed in a course. Students were willing to participate and
456 appeared comfortable when providing open and in-depth responses. The varied responses indicated that the
457 questions enabled students to discuss their experience openly, whilst ensuring data remained rich and focused on
458 the research question. This semi-structured method extends previous unstructured diary room methodologies
459 (e.g., Buchwald et al., 2009; Noyes, 2004), as a more efficient method of data collection and analysis, as well as
460 demonstrating its effectiveness when used in higher education.

461 The semi-structured video diary room also adheres to recommendations commonly suggested for
462 improving the quality of traditional interview techniques. For example, Hastie and Hay (2012) recommend that
463 interviewers would benefit from listening more and talking less, being more tolerant of silences (allowing the
464 participant time to think), making fewer unnecessary interruptions, and avoiding judgemental reactions. The
465 space and time students were given to consider the questions may have also acted as an additional learning aid,
466 encouraging reflective learning. However, a limitation of the interviewee being alone was an inability to follow-
467 up answers that required clarification or further probing. To overcome this limitation, diary room questions must
468 be carefully worded to avoid any possible misinterpretations and entries could be followed up using face to face
469 interviewing.

470 Further research should validate the semi-structured video diary room in different settings. Follow-up
471 interviews could be used to discover how participants found using a diary room and the impact this method may
472 have on their learning experience. Further, a semi-structured video diary room could be implemented in a case
473 study design to assess skill transfer, where an individual's learning experience is followed before, during and
474 after a training course.

475 Overall, this study has demonstrated that outdoor-centred courses offer a unique environment for
476 students to develop interpersonal and intrapersonal skills. The range of course outcomes displayed provides a
477 valuable base for future research into the quantification of these outcomes, the influence of individual
478 differences, and the issue of long-term transfer. In doing so, this study has also developed a novel qualitative
479 method. Whilst requiring further validation, the semi-structured video diary room has been shown to be highly
480 effective in collecting rich and informative data.

481

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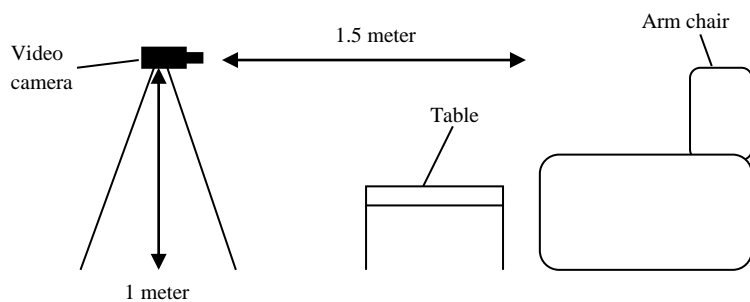
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586 **Fig. 1** The layout of the semi-structured video diary room

587

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589 Table 1

590 *Semi-structured video diary room questions*

Time point	Question
On arrival	<i>Tell us a bit about yourself (your name, where you're from, what you like doing, why you're here)</i> What do you hope to learn on the course? Do you have any concerns about the course?
During day 2	<i>Tell us a bit about your day (what you've been doing)</i> What have you learnt so far on the course? What has been your most meaningful experience here so far? What things have helped you to overcome any difficulties?
End of day 3	<i>Tell us a bit about your experience at [the outdoor pursuits centre]</i> What have you learnt about yourself? What have you learnt that you could use during your academic work or future employment? What was your greatest achievement? What do you feel you will take away from this experience?

591 *Note.* Warm-up questions indicated in italics

592

593 Table 2

594 *A thematic analysis of the groupwork skills course experience*

First level themes	Second level themes	Third level themes
Individual preconceptions	Motivation for attending	Compulsory
		Preparation for future academic work
		Improving groupwork skills
		Positive affect
		Enjoys groupwork
Outcome expectations	Groupwork skills	Preference for independent learning
		What to expect
		Positive views
		Previous experience
		No previous experience
Key elements of the experience	Interesting and enjoyable activities	Personal safety
		Environment
		Physical exertion
		Being amongst others
		Lack of pre-course information
Overcoming the challenge	Interpersonal support	No concerns
		Cooperation
		Leadership
		Communication
		Enjoyment
Reflection on the experience	Positive and memorable	Improved peer relationships
		Benefit to future behaviour
		University
		Employment
		Interesting and enjoyable activities
Overcoming the challenge	Intrapersonal support	Physically demanding
		Intellectually demanding
		Language barriers
		Frustrating
		Sometimes unachievable
Overcoming the challenge	Interpersonal support	Individual weaknesses
		Group weaknesses
		Novel
		Perceived risk
		Natural consequences
Overcoming the challenge	Interpersonal support	Duty rotas
		Free-time
		Groupwork
		Leadership
		Communication
Overcoming the challenge	Interpersonal support	Role allocation
		Trust
		Humour
		Instructor support
		Application of previous knowledge
Overcoming the challenge	Interpersonal support	Emotional control
		Improvisation
		Reflection
		Planning
		Positive and memorable
Overcoming the challenge	Interpersonal support	Exceeded expectations
		Sense of achievement
		Thoughts on transfer
		Thoughts on transfer
		Thoughts on transfer

595 *Note.* See the *online supplementary materials* for a more detailed thematic map including definitions and
596 example quotes

597

598

599 Table 3

600 *A thematic analysis of the groupwork skills course outcomes*

First level themes	Second level themes	Third level themes	
Interpersonal	Groupwork	Communication	
		Leadership	
		Team spirit	
		Group reflection	
		Team roles	
		Cooperation	
		Functioning of intact groups	
		Peer group	
		Student and staff	
		Internationalisation	Internationalising groupwork
	Overcoming multilingual challenges		
	Reduced cultural divide		
Intrapersonal	Mental toughness	Persistence	
		Self-confidence	
		Bravery	
		Adaptability	
		Task management skills	Planning
			Problem-solving
			Time management
		Self-awareness	Self-awareness
			Physical activity
			Outdoor recreation skills
	Motivation		

601 *Note. See the online supplementary materials for a more detailed thematic map including definitions and*
 602 *example quotes*

603