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Goodenough, Anne E ORCID: 0000-0002-7662-6670, MacTavish, Lynne and Hart, Adam G ORCID: 0000-0002-4795-9986 (2013) Developing a Supportive Framework for Learning on Biosciences Field Courses through Video-Based Resources. Journal of Online Learning and Teaching, 9 (3).

Official URL: <http://jolt.merlot.org/>

EPrint URI: <http://eprints.glos.ac.uk/id/eprint/3361>

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Developing a Supportive Framework for Learning on Biosciences Field Courses Through Video-Based Resources

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Abstract

Field courses are an essential component of the undergraduate experience in many subjects, but are intensive and expensive for participating students. Unpreparedness often means time is used teaching the basics rather than challenging students in exciting and novel situations. Moreover, universal participation is not always possible. Video-based resources covering key concepts and techniques could help participant preparedness and could be used independently by non-participants. This reflective case study details a collaborative project in which students and instructors worked together to make conceptual and instructional videos during a highly applied biosciences field course in South Africa. In 2012, after training from a professional wildlife filmmaker, students were involved in planning, presenting, and filming 25 videos. Students benefited considerably from the filmmaking process as explaining concepts and filming techniques helped reinforce their understanding: an example of "see one, do one, teach one." The online, open-access videos were used by the 2013 cohort to increase preparedness and independently by non-participants to good effect, both internally and at several external institutions. New videos will be added each year to expand the resource base and allow students to gain from the filmmaking experience. This teaching and learning strategy is multidisciplinary, with relevance for a range of subjects.

Keywords: biology education, ecology education, fieldwork, filmmaking, video, learner-generated content, "see one, do one, teach one"

Introduction and Literature Review

Field courses are an essential component of the undergraduate experience in many subjects, including biosciences, geography, earth science, environmental studies, and zoology. The experience of being in the field allows students to link together theory and practice to a far greater extent than is possible in the classroom. Because of this and the value of field courses in allowing students to develop and refine key practical skills, the academic importance of field courses within higher education has been widely recognized (e.g., Dillon et al., 2006; [Gamarra, Ironside, de Vere, Allainguillaume, & Wilkinson, 2010](#); [Rahman & Spafford, 2009](#); [Smith, 2004](#)). Moreover, field courses are important in terms of student

experience ([Orion & Hofstein, 1991](#)) and in fostering a professional, collaborative, relationship between students and instructors ([Hart, Stafford, & Goodenough, 2011](#)).

A field course is an intensive and expensive undertaking for participating students, and it is essential to guarantee that resources and student time are used effectively. Underprepared students do not get the most from field courses, especially ones held in unfamiliar locations (see [Hill & Woodland, 2002](#)). Instructor time is often used teaching basic fieldwork techniques, rather than stretching students to the limits of their academic abilities in exciting and novel situations ([Smith, 2004](#)). Moreover, the costs of fieldwork and other issues (e.g., disability, medical conditions, family and work commitments) make universal participation in fieldwork difficult ([Hall, Healey, & Harrison, 2002](#); [Healey, Roberts, Jenkins, & Leach, 2002](#)). Given these issues and the importance of fieldwork in many bioscience disciplines it is imperative to ensure that all students, both participants and non-participants, can get maximum benefit from field course provision at their institution.

To solve the problems posed by unfamiliar locations and issues of participation is not straightforward. In practice, it will never be possible to ensure all participating students are fully prepared, nor achieve 100% participation. However, developing a suite of resources that can be used by participating students before a field course would go a long way to resolve preparedness issues. Such resources, if suitably assembled, could also provide non-participants with appropriate material to allow them to develop the active, inquiry-based approaches that field courses engender, thereby ensuring that such students are not disadvantaged.

Video-based resources can be used successfully to support students' learning experience. There are two basic models: (1) use of concept-based videos that students watch passively with the aim of learning about a particular theory, idea, case study, approach, or paradigm; and (2) instructional videos that students use actively (possibly interactively) to learn a particular technique or skill. The first approach is used throughout higher education both in classroom environments and in distance learning scenarios ([Barford & Weston, 1997](#)). The second approach is used much less frequently, but examples include the teaching mathematical skills ([Phillips, Pead, & Gillespie, 1995](#)) and teaching life skills to students with learning disabilities (Kimball, Kinney, Taylor, & Stromer, 2004; Norman, Collins, & Schuster, 2001).

The aim of the project discussed here was to develop a series of videos for students to use before an intensive residential bioscience field trip to assist with attendee preparedness. Two types of videos were envisaged: conceptual (i.e., discussing theories and concepts) and instructional (i.e., explaining key field techniques). The conceptual videos were seen as resources through which students could get an understanding of the biological, ecological, and environmental contexts of the field course. The rationale for this was to ensure that precious time "on the ground" could be spent in developing an advanced and deep understanding by building on the basic knowledge the students already possessed, rather than starting with first principles and consequently having insufficient time to stretch students' learning. The instructional resources, meanwhile, were designed to enable students to become familiar with key fieldwork techniques so these could be taught more quickly, and to a higher level of competency, in the field than would otherwise be possible. Furthermore, it was planned that the resources would also be designed to be useful for non-participants, with the concept videos being used as case studies to support non-field-based courses, and the instructional videos used externally to the field course by students undertaking independent fieldwork or field-based dissertations to enable skills development, at least to a basic level (see the Discussion section later in this paper).

Rather than instructors making the video resources themselves, the authors wanted to involve students in this innovative use of technology to support learning, with the idea that the videos were made "by students for students" – a prime example of the "see one, do one, teach one" philosophy ([Vozenilek, Huff, Reznak, & Gordon, 2004](#)).

Method

This project involved 28 students and two lecturers working together to record videos to support fieldwork activities as part of an active, multi-institution, field course in April 2012. A U.K. institution, the [University of Gloucestershire](#), offered the course, with the fieldwork activities being conducted at [Mankwe Wildlife Reserve](#), Northwest Province, South Africa. In order for the filmmaking students to get the most out of the filming experience, and to elevate the quality of the films themselves, a pre-field trip session was arranged with a wildlife filmmaker. This was led by an experienced cameraman previously based with the [British Broadcasting Corporation \(BBC\)](#) at their world-famous [Natural History Unit](#) in Bristol. Over 3

hours, the students received a detailed insight into the process of wildlife filmmaking through a talk from an experienced cameraman, which was linked to practice through viewing film sequences. These sequences, shot by that same cameraman, were part of various BBC series (such as [Planet Earth](#) and [The Trials of Life](#)). To contextualize the end result, students were also shown "behind the scenes" video clips and outtakes, (e.g., from the BBC series [Ganges](#)), and video diaries (e.g., from BBC series [Life](#), the episodes of which contained a video diary section entitled "Wild Worlds") as well as the original storyboards. Students then participated in an interactive workshop in which they were asked to storyboard a short film on ant foraging using storyboard templates (see Appendix A) and then film their story using lab-based leaf-cutting ant colonies.

Once on the field trip in South Africa, students and instructors (the first and third authors of this paper) were all involved in scripting, storyboarding, filming, directing, and presenting different aspects of different videos. This involved students and instructors working together as collaborators. Filming was undertaken using two video cameras ([Canon Legria HF M307](#) using on-board sound or with [Canon DM-100](#) external microphones). This equipment was toward the top end of the "consumer" bracket but intended for use by amateurs rather than professionals, and, therefore, reasonably intuitive for students and instructors – all non-professionals with little or no prior experience of filmmaking – to use. To avoid the filmmaking eroding the time available for fieldwork (which itself is often limited, a partial motivator for this initiative) video planning and a considerable amount of the filming was undertaken in the evenings when fieldwork was not possible. The rest of the filming was either done within teaching sessions when it was not a distraction to the learning experience or on one afternoon, during which no fieldwork had been scheduled. In this case, inclusion of a filming afternoon did not prevent additional fieldwork being undertaken, since it was always the intention to have one afternoon that was not based in the field (on field courses, especially long ones in unfamiliar or harsh environments, it is often desirable to have at least one period of camp-based activity). Even if this was not the case, the benefits arising from the filmmaking experience (see the Results and Discussion sections) might be considered sufficient to offset any costs of this activity.

Basic editing (e.g., deletion of non-useable footage) was done in field by instructors (the first and third authors). Post-fieldwork videos were substantially edited and compiled by the project leader (the first author) using Windows Movie Maker, a freely available piece of software designed for amateur use. Editing involved trimming and splitting videos, stitching clips together, adding text captions, integrating still images with movie sequences where appropriate, and adjusting the audio/video synchronization and adding backing tracks where necessary. To provide maximum flexibility in using the videos, two versions of each were produced. The first was a low-resolution version with faster download times and optimized for mobile devices, including smartphones and tablet computers such as iPads, while the second was a high-resolution version with better viewing quality and optimized for computer platforms.

In addition, it was decided that students using the instructional videos either before field trip attendance or, more especially, independently, would benefit greatly from the provision of additional learning materials. These could be used to introduce the methods, circumstances when the techniques might be used, and the data that might be obtained. Accordingly, files containing data, guidelines, or worked examples on how these data should be analyzed, were also provided where appropriate. All videos and resources were uploaded to a specially designed website (<http://www.africanbiosciencevideos.esafari.co.uk/>) constructed specifically to host these resources by the project leader (the first author). Through this non-restricted website, all resources were freely available under the open-access provision of a Creative Commons license. This avoided the access restrictions likely to result from hosting on an Institution-specific website and the concomitant limitations in the use of the resources by the wider academic and student communities.

Student feedback was collected on the pre-field course wildlife filmmaking session anonymously via a password protected online survey. The survey was password protected to avoid non-participants completing the survey and generating erroneous results. This survey combined both quantitative and qualitative approaches (Likert-scale questions and closed questions with yes/no answers, together with open questions with text boxes) and was designed to be very quick to complete, having just seven compulsory questions plus an optional question and a free text box for additional comments. (The complete survey on the filmmaking workshop can be viewed online at <http://www.surveymonkey.com/s/QXPMVZW> using the password "africa," while the quantitative questions and answers from that survey are given in Appendix B.) Feedback on the experiences of the wildlife filmmaking students was collected via informal focus groups (four or five students and one instructor per group), and a specific anonymous, password protected, online survey. (The complete post-

field course survey can be viewed online at <http://www.surveymonkey.com/s/XW2PPVV> using the password "africa," with the quantitative questions and answers appearing Appendix C.) These were supplemented by a student-led course evaluation, which reflected on student experiences on the trip overall. This last was an Institution-specific survey, which included qualitative sections on positive aspects of the course and areas for improvement, as well as statements on "Participating in this module [course] has stimulated my interest" and "Teaching and learning methods have enabled me to achieve," with which students could agree or disagree. Focus groups (again, four or five students with one instructor) were used to assess reception of the videos by the first cohort of students to use them as aids to field trip preparation in 2013.

Results and Discussion

Pre-Field Trip Preparation

The pre-field trip session from a wildlife filmmaker was an essential part of the success of the project. Student feedback showed that this session was extremely well received, with 100% of participants agreeing that the session was useful for skills acquisition and 87% saying it was "invaluable" or "very useful" in preparing them to undertake filming in South Africa (none of the respondents selected the remaining options of "not very useful," or "not useful at all" – see Appendix B). 67% of students reported that it was "vital" that this session was led by a professional cameraman, while 27% said this was "very important" (none of the respondents selected "not very important," or "not important at all" – see Appendix B).

Qualitative feedback included the following:

"The whole session was invaluable! Being taught by such an inspiring person in the wildlife filmmaking industry not only adds to the motivation to film amazing footage in South Africa but also to consider this as a career."

"A fantastic session – our films will now have some assistance from a professional and will hopefully be reflected in their quality."

"It [the session] opened my eyes to the different jobs you can do for the filming that aren't actually filming or being in front of the camera, and how important planning is."

The participants found different aspects of the session helpful (Figure 1). The vast majority found the talk, watching the professional video clips, and seeing the "behind the scenes" footage and outtakes either "invaluable" or "very helpful" (the mean was 93% overall), with only a minority ticking the other options of "fairly helpful," "not very helpful," or "not helpful at all" (Appendix B). One student commented that it was very useful seeing both "good" and "bad" takes of a particular sequence, since this highlighted what made both, what to aim for, and, arguably more importantly, what to avoid.

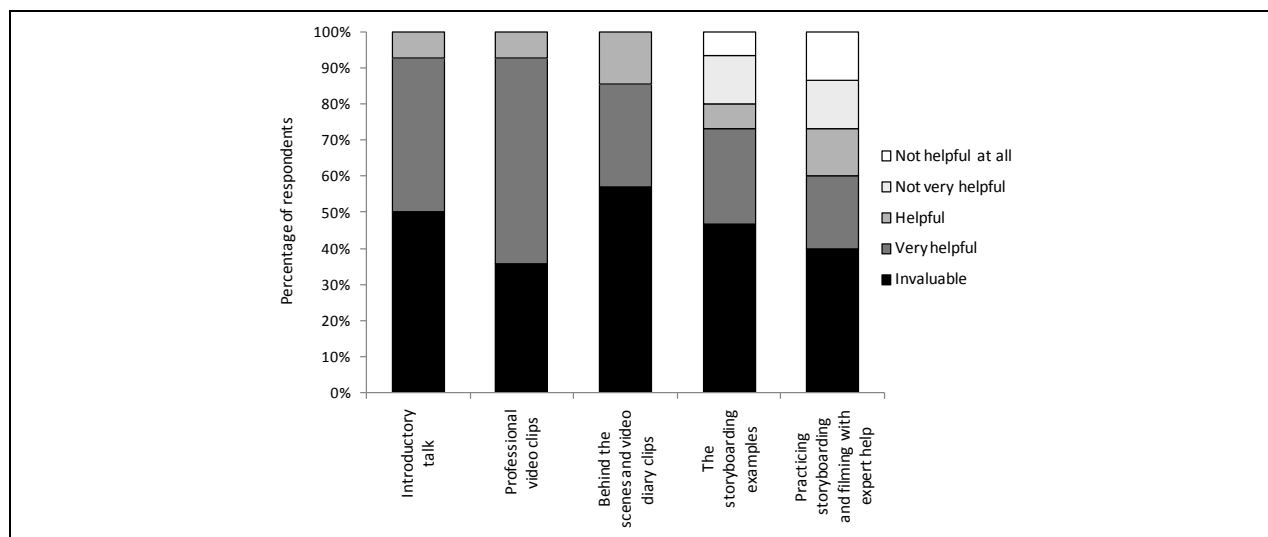


Figure 1. Student feedback on the perceived usefulness of different aspects of the pre-field trip filmmaking workshop, collected via an anonymous online survey

Although the more interactive parts of the session – creating a storyboard and actually doing filming – were well received, the percentage of students rating this as "invaluable" or "very helpful" dropped from 93% to 77% relative to the more structured part of the session (Figure 1). Examination of the qualitative feedback suggests that this might have been because the interactive part of the session was rather time constrained. In retrospect, the time allowed was not really sufficient to allow inexperienced participants the freedom to develop ideas, storyboard, and complete filming to a high standard. This demonstrates the need to consider timing carefully to ensure freedom for blue-sky thinking and high-level engagement with material, especially when active learning is built in.

Feedback also suggested that the session could have been improved by a more detailed tutorial on how to actually use the video equipment (covering the basics of how to film, useful settings, panning and zooming techniques, and so on). The intention had always been that such techniques should be learned "on the job," since these skills cannot be taught easily in the abstract. This was not articulated to students, although when they were filming in South Africa, they did indeed learn "on the job" and no further mention was made of any formal training session being necessary.

The Videos and Other Resources Produced

During the field trip, 15.3 hours of footage were recorded, in total. In several cases, two separate camera crews filmed the same activity so as to provide dual footage and a choice of perspectives during editing. The overall footage was edited to yield 25 discrete videos totaling 5.5 hours (ranging in length from 38 s to 32 min 29 s, with an average length of 13 min 20 s). Half of these were instructional videos, which covered using field equipment to perform simple tasks (e.g., using a compass to take a bearing, using a Global Positioning System (GPS) unit to record and locate a survey point, and using an optical range finder to measure distance), while others covered more advanced skills (e.g., field mapping and setting up remote cameras). Several industry-standard ecological surveys were also covered, including avian point counts (Bibby, Burgess, Hill, & Mustoe, 2000), monitoring large mammals using strip transects (Sutherland, 1996), and Veld grassland condition indices ([Tainton, 1999](#)). Numerous resources were produced to support the instructional videos, including, for example, briefing documents, data files, worked examples of data analysis, and camera trap images. There were also 11 conceptual videos, covering theory and the practical application of this theory, often using the techniques covered in the instructional videos. All the instructional and conceptual videos were a collaborative effort, with both students and lecturers involved in scripting, storyboarding, filming, directing, and presenting different aspects of the videos. The final two videos were entirely student led and focused on student experience, giving tips and advice for studying ecology in the field.

Experience of Making the Videos: Student and Instructor Perspectives

Feedback suggested that students gained considerably from making these videos. Explaining concepts and techniques on camera, or being involved with planning how these should be presented, helped reinforce their own understanding of key field techniques; a prime example of the "see one, do one, teach one" philosophy ([Vozenilek et al., 2004](#)) whereby students gain deeper understanding by teaching something to others ([Krych et al., 2005](#); Whitman, 1988). It is also both a good example of experiential learning (Kolb, 1984) and of the value of such a learning process. The students themselves recognized this, with all participants reporting that they felt the video-making process helped them better understand key concepts and techniques (compared to simply being told something or shown how to use a piece of field equipment) and stating that it would have been very beneficial to have had access to videos similar to the ones that they made before going on the trip (Figure 2; Appendix C). The experience also provided specific filmmaking skills, as well as additional transferable planning, communication, teamwork, and leadership skills (Figure 3). Interestingly, it was in improving planning and teamwork that students felt the videos helped most, both transferable skills that are valued highly by employers (Fallows & Steven, 2000; [Saunders & Zuzel, 2010](#)). It would be interesting, in the future, to test whether making videos led to an objective, significant, improvement in student learning in addition to their perceptions of improvement.

Importantly, students not only felt that they benefited from the filmmaking process, they also enjoyed it, with 40% saying it was "extremely enjoyable" and the remaining 60% saying it was "very enjoyable" (none of the respondents selected the remaining options of "fairly enjoyable," "not really enjoyable," or "not at all enjoyable" – see Appendix C). The overall experience of making the videos is summed up by comments on the course evaluation and the online survey:

"The Africa fieldtrip was the best two weeks of my life. Making the videos was really interesting & made me really think about the techniques I had learnt and how to communicate them"

"The trip itself was an unforgettable experience, I feel privilaged [sic] to have done it ... it has changed my life! The videos really added an extra dimension."

"I learnt so much more than I could ever have imagined."

"It [making the videos] helps you get a better grip as you need to know the technique well before being able to talk about it on camera. Very useful."

"I was able to put some of the skills to good use for my dissertation."

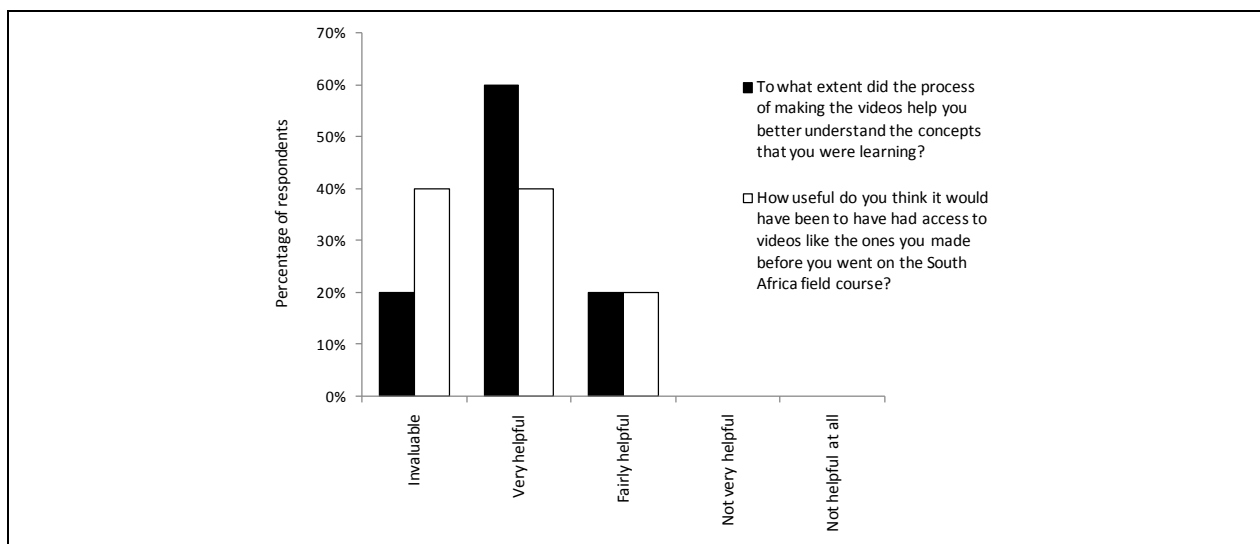


Figure 2. Student perceptions of the usefulness of the filmmaking process for their own learning and for future cohorts

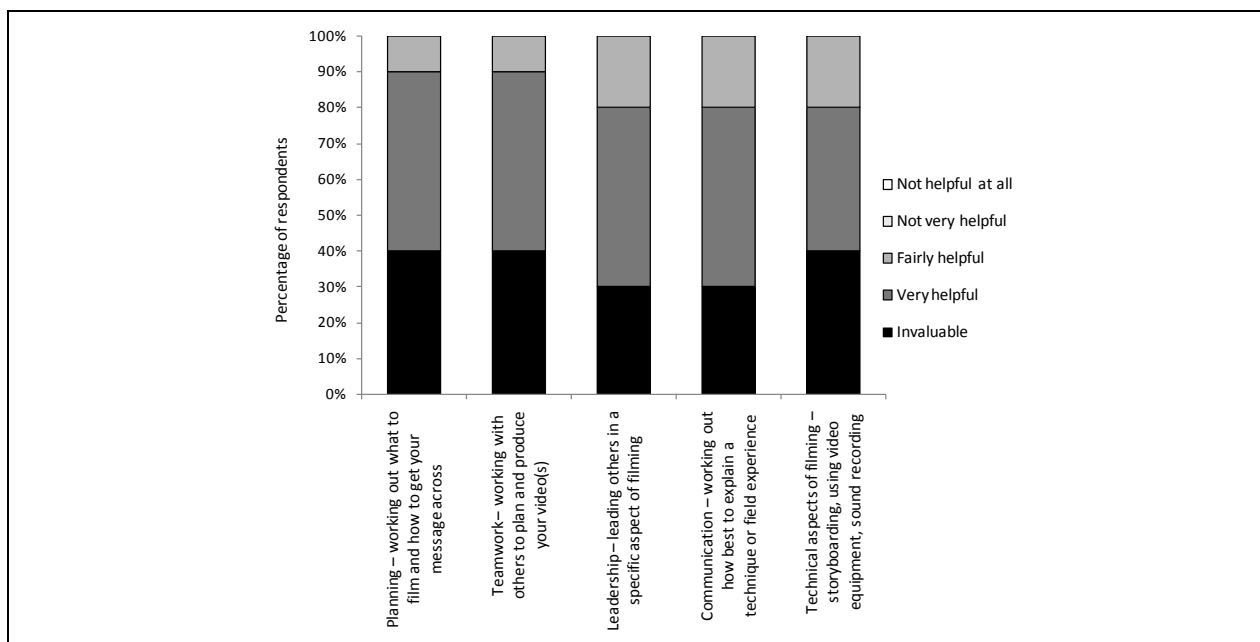


Figure 3. Transferable skills that students felt they learned through the filmmaking process

Overall, the field trip course evaluation results showed that 93% agreed with "Participating in this module [course] has stimulated my interest," while 96% agreed with "Teaching and learning methods have enabled me to achieve." This compares with evaluations for other biosciences courses in the same period of 60% and 83%, respectively. It was also noticeable to the instructors (the first and third authors, who are

experienced at running residential field courses in both the U.K. and abroad (France, Portugal, Brazil, and Mexico), that because the video project involved both students and instructors, it engendered a collaborative atmosphere. In this way, it acted to extend other initiatives used on field trips to promote a mature lecturer–student relationship to further students' academic development (discussed in [Hart et al., 2011](#)), as well as facilitating peer-assisted learning (Topping & Ehly, 1998). The plan is for this to become a long-term project, with new videos and accompanying resources being added by successive cohorts.

Experience of Using the Videos to Prepare for Trip Attendance

Students going to South Africa in 2013 have found the videos a very valuable preparatory resource and are building up valuable skills pre-trip that can be extended much more in the field than would be possible with inexperienced participants. They are finding that the way these skills are being taught through the medium of video maintains their interest and makes the techniques themselves easier to learn. This is especially true for students who find it hard to understand skills from written instructions or diagrams – for example, dyslexic or dyspraxic students who learn best from audio and/or visual resources (Hargreaves & Baty, 2012). As one student commented:

"The videos are really helping us learn field skills in a way you just don't get from a book – they are amazing! I love that they have been made by students for students."

An unexpected benefit of the videos has also been that some students have reported feeling more confident about going on the field course having viewed the videos, especially those filmed around camp. As one student noted:

"I feel so much happier about going now I know what the place looks like. It sounds daft, but it has taken away some of the fear of the unknown."

Experience of Using the Videos for Independent Learning

In the 6-month period between the videos becoming available and the time of writing of this paper, the videos have already proven valuable for skills acquisition for non-participants. For example, one of the conceptual videos, on the future of conservation of African mammals, has been used to support a session in a Master's course on *Applied Conservation and Management*. Different clips from the video were integrated with other material to facilitate debate about conservation priorities and sustainability from different stakeholder perspectives. The instructor leading that session, who is an experienced academic and ecological practitioner, commented:

"It was really useful to have access to these videos. Often debates can stall mid-session and it is useful to have prompts to re-engage the students and provide opinions countering those being aired at the time. The videos enabled that to happen naturally, without me having to take the role of devil's advocate all the time."

The instructional videos are also proving useful. For example, one, on bird surveying, has been used by a student undertaking a dissertation project in which bird surveys are key to data collection, while the video on using Vernier calipers to take precise and accurate measurements has been used within a class-based laboratory skills session attended by more than 50 students. In this case, the video solved the problem of the instructor not being able to demonstrate the technique to more than two or three students at a time because of the need for them to see exactly what was happening, whereas the video could simply be displayed on the big screen. Moreover, it is also possible for the videos (especially the low-resolution versions) to be run on mobile devices and thus used in field environments when techniques are actually being used. The videos, which are open access, are also being used at other institutions to good effect, as one lecturer from a different institution to that of the authors commented:

"The videos are excellent for teaching students complex fieldwork skills in a memorable way."

Conclusion and Lessons Learned

This project has shown that it is possible to make high-quality videos, both conceptual and instructional, through student–instructor collaboration. These resources benefit both the cohort involved in making the videos and subsequent cohorts who use them, and the collaboration between students and instructors helps build positive relationships and advance students' academic development. In terms of increasing preparedness, videos made by instructors, without student involvement, could arguably have been just as useful. However, involving students in making these videos provides three advantages that videos made by instructors alone would not have: (1) the benefits that filmmaking students get from explaining a

technique on camera in terms of deeper learning of that technique ("see one, do one, teach one"); (2) the transferable skills filmmaking students acquire/improve through the filmmaking process (planning, teamwork, etc.); and (3) the appeal of the videos to the next cohort by virtue of them being "by students, for students."

Although in this case the project involves biosciences students on residential fieldwork, the use of filmmaking as a teaching and learning strategy is far from being a discipline-specific initiative, instead having applications in many subject areas. In terms of instructional videos, similar projects could be run, for example, in other sciences (e.g., chemistry laboratory experiments), medicine (e.g., medical, dentistry, veterinary, and pharmacology procedures), geography and environmental sciences (e.g., fluvial or geomorphology fieldwork), criminology (e.g., forensic techniques), psychology (e.g., neuroscience methods such as electroencephalography), art (paint or illustration methods), photography (e.g., high-speed or macro techniques), and many more. As regards the conceptual videos, these would have applicability across the entire suite of science, arts, humanities, education, and business subjects.

To ensure maximum success, it is recommended that future projects have a explicit objectives in terms of the topics to film and the type of videos that should be produced in order to provide students with clear guidance and direction in terms of what is expected of them. Allowing sufficient time for filmmaking is important; however, this does need to be time limited to ensure tasks are completed. Investment in preparing participating students (and instructors) for the task of making the videos was highly valuable and is recommended for those undertaking similar projects. Further, more specific recommendations are given in Figure 4. If possible, future projects should also assess the academic effectiveness of the filmmaking process, and the usefulness of the videos themselves for increasing student learning in subsequent cohorts, objectively. This might involve, for example, testing knowledge and understanding both before and after filmmaking or film-watching activities. This was beyond the remit of the current study, but this form of objective assessment would be extremely useful in advancing understanding of the effectiveness of this teaching and learning strategy and suggesting areas for improvement.

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Staff-student collaborative filming – a checklist	
Task 1 - Decide on outline topics for filming	
Should take account of learning outcomes for film-making students (if any) and needs of target audience. Will affect what equipment/training is suitable/necessary	<input checked="" type="checkbox"/>
Task 2 - Obtain suitable equipment	
<i>Camcorder</i> – should be small, light, intuitive to use, and record on high capacity external media (e.g. SDHC). Long battery life (ideally 4 hrs +) and a standard screw-in tripod mount essential. Need input for external microphone (3.5 mm jack or via a hotshoe) and mount for same. Think about whether telephoto or close focus capabilities are necessary (e.g. if filming distant objects or using for macro work).	<input checked="" type="checkbox"/>
<i>Tripod</i> – should be light but sturdy, and have a camcorder stabilizing pin if needed. Maximum operating height of 1.5 m + to avoid camcorder being angled upwards when filming a presenter.	<input checked="" type="checkbox"/>
<i>External microphone</i> – needed for all recording except close filming of a presenter in a quiet environment. Microphones manufactured specifically for a specific camcorder best if available. Recording sound at the same time as filming reduces the need for post-processing compared to recording audio and visual separately and syncing later.	<input checked="" type="checkbox"/>
Task 3 - Organise a preparation session with an expert	
Will improve skills of film-making staff and students and encourages non-experts to think like film-makers. Needs to cover basics of film-making, storyboarding, setting up shots, recording images/sound, and post-production. Expert could be a professional film-maker or “expert amateur”, e.g. from a local film or camera club). If possible, session should be led by someone with interests/skills/experience in a relevant area (e.g. a wildlife film-maker).	<input checked="" type="checkbox"/>
Task 4 - Shoot videos	
<i>Planning</i> – plan videos carefully and storyboard each sequence so each “story” is told clearly and concisely (the template in Appendix A might be helpful). Often useful for each student to have an allocated role in a team (director, camera operator, sound operator, presenter) from planning stage onwards.	<input checked="" type="checkbox"/>
<i>Pre-shooting checks</i> – check frame rate per second and picture quality (higher = better, but larger file size) and that microphone working correctly at a sufficient volume and without too much background noise.	<input checked="" type="checkbox"/>
<i>Undertake filming</i> – videos can be cropped, split, and added together later, but careful shooting will minimise post-processing work. Don’t “leave the camera running just in case” – plan the shot, make it, turn the camcorder off. Think about camera angles. Make good use of panning and zooming to make sentences more dynamic. Avoid camera shake by using a tripod. Multiple takes may be required.	<input checked="" type="checkbox"/>
Task 5 - Edit videos	
<i>Choose editing software</i> – several free pieces of software available for editing videos, such as Windows Movie Maker, which is relatively quick and easy for non-experts to learn with online help, or Serif MoviePlus. For more advanced users, Adobe Premier Elements provides increased flexibility.	<input checked="" type="checkbox"/>
<i>Edit videos</i> – more short videos better than fewer longer ones (easier to manage smaller files). Trim, split, and splice video clips to make up each video sequence. Keep the interface “clean”, minimising the range of transition types. Ensure audio is high enough; tweak if necessary. Avoid adding background music over commentary. Add on-screen text as necessary. If different videos are edited by different students, agree on a house style at outset.	<input checked="" type="checkbox"/>
<i>Produce videos</i> – once audio-visual sequence correct, video must be converted to a playable format (WMP, MPG, AVI common and play on most platforms). There is usually an option to control quality – higher is better but file sizes can be too large for portable devices. Creating high- and low-resolution versions of each video might be useful.	<input checked="" type="checkbox"/>

Figure 4. Checklist of recommendations for practitioners adopting a student–instructor collaborative filming approach

Appendix A: Video Storyboard Template

Video storyboard Commercial title _____
 Student name _____

Give shot type & length

Give shot type & length

Appendix B: Quantitative Section of Survey on the Pre-Field Course Filmmaking Workshop

The full survey may be viewed at <http://www.surveymonkey.com/s/QXPMVZW> (password: africa).

1. Please rate the experience you had at the wildlife filmmaking workshop in terms of interest and enjoyment.

	Percent	Count
Excellent	73.3	11
Very good	20.0	3
Good	6.7	1
Fair	0.0	0
Poor	0.0	0

2. How useful was the workshop in preparing you to undertake filming in South Africa?

	Percent	Count
Invaluable	46.7	7
Very useful	40.0	6
Fairly useful	13.3	2
Not very useful	0.0	0
Not useful at all	0.0	0

3. What aspects of the workshop did you think were helpful?

	Percent ^a					Count
	Invaluable	Very helpful	Fairly helpful	Not very helpful	Not helpful at all	
The talk	46.7	40.0	6.7	0.0	6.7	15
The professional video clips	33.3	53.3	6.7	0.0	6.7	15
The "behind the scenes" / diary-style video clips	53.3	26.7	13.3	0.0	6.7	15
The storyboarding examples	46.7	26.7	6.7	13.3	6.7	15
The activity: Practicing storyboarding and mock filming with expert help	40.0	20.0	13.3	13.3	13.3	15

^aDue to rounding, some of the percentages do not sum to exactly 100.0%.

4. How important was it that the session was led by a professional wildlife filmmaker?

	Percent ^a	Count
Vital	66.7	10
Very important	26.7	4
Fairly important	6.7	1
Not very important	0.0	0
Not important at all	0.0	0

^aDue to rounding, the percentages do not sum to exactly 100.0%.

5. Overall, do you think the session will help you make interesting and high-quality videos while in South Africa?

	Percent	Count
Yes	100.0	15
No	0.0	0

Appendix C: Quantitative Section of Post-Field Trip Survey

The full survey may be viewed at <http://www.surveymonkey.com/s/XW2PPVV> (password: africa).

1. How enjoyable did you find making the videos?

	Percent	Count
Extremely	40.0	4
Very	60.0	6
Fairly	0.0	0
Not really	0.0	0
Not at all	0.0	0

2. To what extent did the process of making the videos help you better understand the concepts that you were learning? For example, if you made a video about GPS units, how useful was that process in helping you to understand uses of GPS units compared to "just" being shown how to use the kit by a lecturer?

	Percent	Count
Invaluable	20.0	2
Very helpful	60.0	6
Fairly helpful	20.0	2
Not very helpful	0.0	0
Not helpful at all	0.0	0

3. What additional/improved skills do you think making the videos gave you?

	Percent					Count
	Invaluable	Very helpful	Fairly helpful	Not very helpful	Not helpful at all	
Planning – working out what to film and how to get your message across	40.0	50.0	10.0	0.0	0.0	10
Teamwork – working with others to plan and produce your video(s)	40.0	50.0	10.0	0.0	0.0	10
Leadership – leading others in a specific aspect of filming	30.0	50.0	20.0	0.0	0.0	10
Communication – working out how best to explain a technique or field experience	30.0	50.0	20.0	0.0	0.0	10
Technical aspects of filming – storyboarding, using video equipment, sound recording	40.0	40.0	20.0	0.0	0.0	10

4. How useful do you think it would have been to have had access to videos like the ones you made before you went on the South Africa field course?

	Percent	Count
Invaluable	40.0	4
Very helpful	40.0	4
Fairly helpful	20.0	2
Not very helpful	0.0	0
Not helpful at all	0.0	0

Acknowledgments

Work was funded by the U.K. Higher Education Academy's Centre for Biosciences and the Dame Janet Trotter Charitable Trust. The authors would like to thank staff and volunteers at Mankwe Wildlife Reserve, South Africa; field course co-tutors Lucy Clarke and Mary Farrell (Hartpury College); Tom Clarke for running the filmmaking preparation session; and Rick Stafford (University of Bournemouth) for help setting up the web domain. Thanks are also due to three anonymous peer reviewers for their detailed and constructive comments on an earlier version of this paper.



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