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## **Podcasting, Pupils and Pre-service-teachers**

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### **Abstract**

An action research pilot examined the use of podcasting to assess short research studies by a group of six undergraduate, pre-service final year science teachers. The podcasts were assessed against existing criteria for presentations and audited towards the Benchmark Standards for Initial Teacher Education in Scotland. The authors explore podcasts as a means of promoting sustainable assessment and consider their potential within professional graduate teaching courses.

The research explored the following questions:

- Did the process of preparing podcasts extend students' professional learning?
- Can pre-service teachers deliver a well planned, coherent and well organised presentation to demonstrate their understanding of principles of learning and teaching?
- Can pre-service teachers prepare a podcast to describe their own action research findings?

The authors supported the study group in the process of creating educational podcasts and to research an aspect of science education. Qualitative data and quantitative data were collected and provided multiple data sources for triangulation purposes.

The research found that the target audience met, and in many ways exceeded our expectations. We suggest that the approach is transferable to a larger group of PGDE pre-service teachers for further study.

## ***Introduction***

This Action Research conforms to the definition as “a small scale intervention in the functioning of the real world and a close examination of the effects of such an intervention.” (Cohen, Manion, & Morrison, 2000) It was a pilot study that used a small, but representative, group of students with a view to establishing generalisations about the wider applicability of the methods explored (Burns, 2000). The authors examined the use of podcasting – a popular contemporary method of delivering audio content through computers and portable media players – and its potential to be used as an instrument of assessment. Many rationales for the use of podcasts in education can be advanced, for example Freedman (2006a) lists sixteen reasons including the potential for students to access the podcasts at their own convenience. See also Maag (2006) and Kollar (2006).

The study group included six undergraduate, pre-service science teachers who were completing a BSc (Honours) in Bioscience with Teaching. They had previously undertaken course assessments that incorporated presentations to peers and tutors. These pre-service science teachers had already completed block and serial school placements and were considered as being skilled in planning and delivering short presentations as part of their classroom practice as well as comprising a significant component of their undergraduate coursework. Their presentations had invariably been supported with well-constructed and illustrated PowerPoint presentations.

The Benchmark Standards for Initial Teacher Education (SITE) (General Teaching Council for Scotland & Quality Assurance Agency for Higher Education, 2006) relate to classroom to whole school standards for ITE in Scotland. They make specific reference to the significance and the expectations for Information and Communication Technology (ICT). Information and Communication Technology is viewed (paragraph 3.1) as a “Core professional interest” and student teachers should be “undertaking a range of approaches to teaching to facilitate the learning of pupils, including the appropriate use of information and communications technology”. Also, Information and Communication Technology provides the potential “to contribute to a process of change”.

Boud (2000) was critical of assessment practices in higher education institutions and suggested “The purposes of assessment should be extended to include the preparation of students for sustainable assessment”. Draper and Maguire (2007) explored the use of podcasts in campus based teaching with first year undergraduates in the Re-engineering Assessment Practices (REAP) project.

These considerations helped motivate the authors to explore podcasts as a means of promoting sustainable assessment with fourth year undergraduates and consider their potential within professional graduate courses.

## **Research Questions**

- Did the process of preparing podcasts extend their professional learning?
- Can pre-service teachers deliver a well planned, coherent and well organised presentation to demonstrate their understanding of principles of learning and teaching?
- Can pre-service teachers prepare a podcast to describe their own action research findings?

## **Literature Review**

Podcasting is a relatively new technology. The name was probably coined by Ben Hammersley in 2004 (Hammersley, 2004) and was only added to the New Oxford American Dictionary, in early 2006 after being named Word of the Year for 2005 (Oxford University Press, 2005). Despite its youth, the growth of podcasting has been impressive. For example, within two days of launching a podcasting service on iTunes, Apple reported one million subscriptions. (Apple Press Release, 2005) Also, ownership of MP3 players (which allow mobile access to podcasts) continues to grow (see for example Apple Press Release, 2008). In 2006 it was reported that 26% of people over 15 in the UK owned an MP3 player (National Statistics, 2007) and the Pew Internet and American Life Project reports similar growth in podcast use in the USA. They report that in May 2008, 27% of 18-25 year olds had downloaded at least one podcast compared to 10% in April 2006. They also report that a survey in December 2007 found that 61% of 18-29 year olds owned an MP3 player (Pew Internet & American Life Project, 2008).

It is not surprising therefore that educators have looked at podcasting to see how it can assist with learning and teaching. Some suggested uses are not particularly imaginative, for example using podcasts to time-shift lectures (EDUCAUSE, 2005). However, some recognise a wide range of uses for podcasting in education, for example Freedman (2006a) lists sixteen reasons including the potential for students to access the podcasts at their own convenience and enabling students to submit work in the form of a podcast. See also Maag (2006) and Kollar (2006) for further examples of educational uses and justifications for podcasting.

Fox (2001) gives a good critique of constructivist approaches to learning and teaching. A constructivist approach would suggest that a basic transmission model of podcast use, where the tutor transmits knowledge to the student by podcast, could be less effective than involving students in podcast production. As Biggs (1999) quotes: "What the learner does is actually more important than what the teacher does." He states that educative conceptual change can take place when students have clear objectives, are motivated, able to concentrate on the task and can work collaboratively in dialogue with others. In other words, useful learning can take place as a result of dialogue between peers and the whole social context of learning is important. The dialogue that takes during podcast production and between students after listening to podcasts is a key part of the learning.

Some writers have gone as far as suggesting that today's learners, having grown up in an information rich digital world, are somehow different from learners in previous generations. For example, Prensky (2001) talks of a distinction between "digital natives and digital

immigrants”. Veen and Vrakking suggest that a revolution has taken place and that a “new actor is marching into the arena of educational change” (Veen & Vrakking, 2006, p.5). Others remain more cautious. For example Mason and Rennie do not see a “paradigm shift” but rather a growth and development from previous practice (2008, p. 1). However, even they acknowledge the effects of social networking tools will have an effect on course design and that students will be more involved.

So, a constructivist approach would suggest that involving learners in creating podcasts for the tutor, for peers, for younger learners or for assessment could be more valuable than simply listening to podcasts created by tutors and experts. Certainly, some early pioneers of educational podcasting were quick to see the value of involving learners as creators of podcasts rather than just consumers. Ewan McIntosh reports that when he started Europe’s first school podcast in May 2005 he quickly discovered the motivational power of giving his students a worldwide audience (McIntosh, 2006).

There is, at the time of writing, little published research on students as producers of podcasts. However, one which helped inform this study is from Chan, Lee, & McLoughlin (2006) who report on a from Charles Sturt University. Chan et al. identify five variables effecting student learning that can be impacted by student producing podcasts, namely:

- Motivation
- Benefits of involvement
- Skills developed
- Lessons learnt
- Suggestions for improvement

(Chan et al., 2006, p. 117)

We will comment on our students’ experience under each of these headings later in the paper.

## ***The study group***

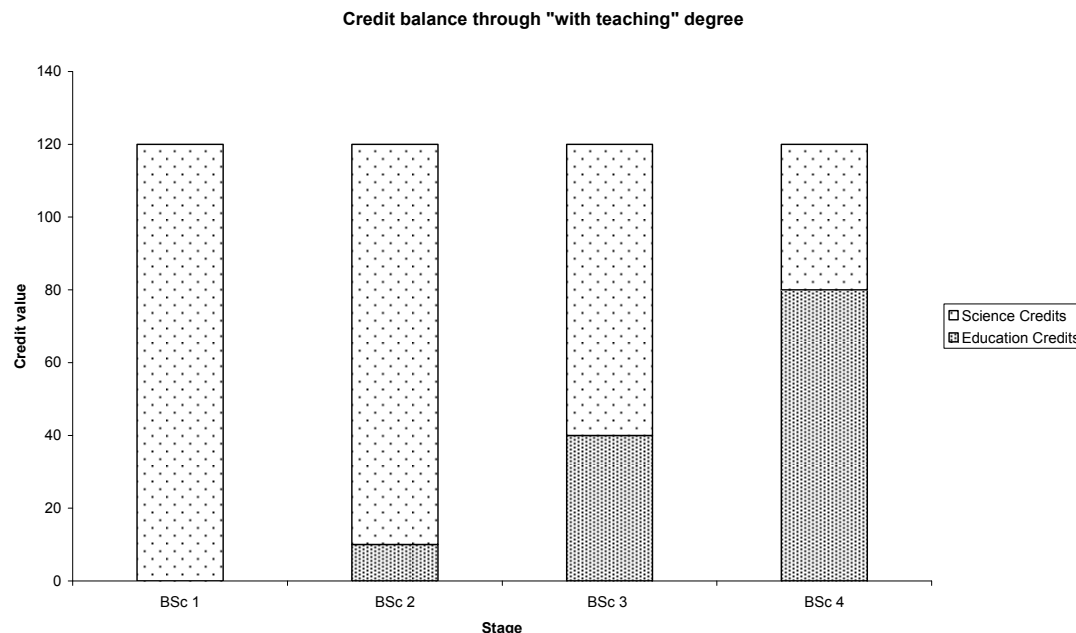
A small group of final year students, who were completing a Bachelor of Science “Bioscience with Teaching” (UCAS Code C1XC) at the University of Strathclyde, were identified as being suitable subjects for this initial study. The degree was established in 2004 in response to course review of an earlier version. The entry requirements for the degree was identical to those for Biological and Biomedical Sciences Courses but included a Higher Grade English at C or equivalent, in order to meeting the entrance standards (Scottish Executive, 2005) for degrees leading to a teaching qualification in Scotland. The degree had passed internal review and external accreditation, by the General Teaching Council for Scotland (GTCS) in 2004. Guidelines (The Scottish Office Education and Industry Department, 1998) described the requirements required for gaining accreditation.

The group included 6 female students aged from 21 – 26 years at the time of graduation. They were a socially well-formed and mutually supportive group.

Figure 1 illustrates the degree structure to show the progressive involvement of education classes. This degree structure had been selected to achieve flexibility in terms of student

choice and to include progressive immersion in education classes to reflect developing confidence, maturity and commitment.

Figure 1 Degree structure



During the third year of the degree the group had completed block and serial school placements as well as attending first semester classes in curriculum studies. Previous assessments (30 credits in education and 30 credits in bioscience) had involved presentations to their peers and tutors. These were supported with PowerPoint presentations and had been successfully overtaken by all students.

During the first semester of the fourth year of the degree the study group had completed all the degree requirements in bioscience. They were spending the final semester attending classes concurrently with students following the Professional Graduate Diploma of Education (Secondary), the standard one year pathway to entering the teaching profession in Scotland. This involved curriculum studies, professional studies and two block placements (6 weeks starting in February and 4 weeks in May).

They also shared a common end point as far as their professional development – the Standard for Initial teacher Education in Scotland (General Teaching Council for Scotland & Quality Assurance Agency for Higher Education, 2006), an essential prerequisite for provisional registration as a teacher with GTCS. The final semester timetable included 10 weeks on campus, with classes in educational and curriculum studies, and 10 weeks on block placement (6 weeks in February/March and 4 weeks in May) on block placement in local secondary schools.

The Standards for Initial Teacher Education in Scotland (SITE) (General Teaching Council for Scotland & Quality Assurance Agency for Higher Education, 2006) promotes three main aspects of professional development: Professional knowledge and understanding; Professional skills and abilities; and Professional values and personal commitment.” SITE makes several references to Information and Communication Technology (ICT)

Table 1 illustrates specific references to ICT in The Standard for Initial Teacher Education which is described as key elements and their expected features.

Elements of the Standard	Expected features (Selected)
1.1.2 Acquire the knowledge and understanding to fulfil their responsibilities in respect of cross curricular themes including citizenship, creativity, enterprising attitudes, literacy and numeracy; personal, social and health education; and ICT, as appropriate to the sector and stage of education.	Demonstrate appropriate knowledge and understanding of ICT and its uses in education and educational settings, referring to current national guidance.
2.1.3 Employ a range of teaching strategies and justify their approach.	Demonstrate that they can select and use a wide variety of resources, including ICT and, where appropriate, the outdoor environment, in a considered way and in a number of different learning and teaching situations.
2.2.1 Organise classes and lessons to ensure that all pupils are safe and productively employed when working individually, in groups or as a class.	Know how to enable pupils to make full use of well-chosen materials and equipment, including ICT.

Table 1 ICT in the Standard for Initial Teacher Education

The group had demonstrated ICT capability in a number of ways during the degree. During education classes they had previously demonstrated significant skill in using several applications e.g. Word, Excel, PowerPoint, FirstClass and Outlook as well as a number of data-logging and data-capture applications. Science degree requirements included completion of classes BB113 and BB213 Personal Development Plan each of which required competence in IT applications.

## Course Assessment

Students were issued with a handbook (University of Strathclyde, 2007) with comprehensive information on all aspects of the programme and included a timetable and assessment requirements and success criteria. Teaching required the assessment of observed lessons by faculty and school staff. Faculty and school staff completed reports and graded the students teaching performance. Written assignments assessed holistic aspects of the course and required a synthesis of all modules and school experience. The third and final assignment involved a short research study, related to the teaching subject, conducted on placement, and required a written and presentation component. Appendix 1 reproduces the complete task specification and grading criteria for Assignment 3. The key features that were of interest to the study included:

The credit rating for the assignment;  
Aspects relating to topic choice;



Data would be collected during teaching placements;

The output would be in two parts;

Firstly a written report which would include a description of:

- a. chosen topic
- b. professional justification
- c. research questions (3 or 4 at most)
- d. research method(s)
- e. outline of findings (brief)
- f. word length
- g. bibliography

And secondly an oral presentation to class and two tutors that would:

- a. specify research questions
- b. describe research methodology
- c. present findings
- d. reflect experience in schools
- e. refer to appropriate principles introduced in course and other relevant reading
- f. draw conclusions
- g. be of 20 minutes duration including time for questions\*

(\* The duration was modified due to the innovation of the approach and was left as being flexible.)

Criteria for Merit/Satisfactory/Unsatisfactory were supplied in 4 areas relating to the written report and the presentation. Criteria 1 referred to a written report and Criteria 2, 3 and 4 referred to aspects relating to the formal presentation. These illustrate how the students were to be assessed on the presentation content, and their presentation skills e.g. organisation, pace, fluency, transitions, dealing with questions, effective use of resources. These formed the basis of the study and we were interested to learn if the assessments could be completed remotely. That is, the students would record and submit a podcast describing their research and then take part in an online discussion forum to ask and answer questions on their presentation. The relevant criteria are general in nature and can easily be applied to podcast presentations.

- “2. In the course of the presentation, specify your research questions, describe your methodology and show how your findings emerge from these.
3. In the course of your presentation, draw on your practical experience in schools and on appropriate principles introduced in course material and other relevant reading.
4. Deliver a professional, coherent and well-managed presentation which achieves stated objectives.”

## **Methods**

The authors supported the pre-service science teachers in the process of creating educational podcasts. This included an initial briefing, illustration of ‘good practice’ and support from ICT staff in technical aspects of creating podcasts. The study group was required to research

appropriate science education content for classes they would teach during school experience. They were supported in this aspect by science staff.

## **Ethical approval**

The project conformed to University and departmental procedures for ethical approval. A proforma was lodged with the department's Research Committee. Students were required to undertake procedures relating to ethical approval. The proposed study required a description of the project during completion of an internal Ethical Approval Form. This also conformed to the University's ethical policies and Code of Practice and required description of the aims, target audience and means of recruitment and access, the proposed methodology and procedures to be used. Questions relating to physical or psychological, access to information about participants from other parties or any ethical issues completed the process.

## **Technical support**

The students were first introduced to a range of science podcasts that were considered relevant to school science education. Although all the students had devices capable of listening to podcast, only one student had previous experience of listening to podcasts. It was felt to be important to allow the students time to explore a range of podcast styles and to give them practice at subscribing to, downloading and listening to podcasts before asking them to produce their own. Therefore, the group was provided with exemplar podcasts from a variety of sources, styles and anticipated audience. (Specifically: American Association for the Advancement of Science, 2008; Anderson, 2008; Dolgin, 2008; Hazen & Nelson, 2008; Hudson, 2008; The Open University, 2008) This list of podcasts subsequently became a blogroll on the SSciPod site (Muir, 2008).

The students were also given links to relevant background reading (for example, relevant sections from British Telecom, 2008; Freedman, 2006b) so that they could begin to consider what is involved in creating an useful educational podcast.

The students then had two compulsory workshops in a computer lab followed by a number of optional workshops where students could receive further practical support if necessary. In order to keep the technical requirements low, the students were strongly advised to create audio only podcasts and produce only short podcasts. In the first workshop, the importance of observing copyright was explained and sources of "podcast safe" music and sound effects were introduced. A loan pool of Apple iBooks was available, so the students were given tuition on the Garageband (Apple Inc., 2008) although we also gave a brief introduction to Audacity (Audacity Development Team, 2008) for students who wished to use their own Windows based machines.

The first workshop involved the creation of a theme tune for the podcasts and subsequent workshops involved creating and mixing spoken tracks with music and sound effect tracks. The students were then supported in saving their podcasts in an appropriate format. The podcast files were then submitted electronically. Students could, and did, seek further support and advice by email.

Most of the students produced their podcasts on the borrowed Apple laptops although one student used her own Windows PC and another student used her mobile phone to record the podcasts.

## **Assignment briefing**

The suggestion that the students would complete an alternative version of Assignment 3 was first suggested to the student group at a consultative committee meeting in the first few weeks of the final year and the students indicated enthusiasm towards making the presentations as podcasts. The tutor gained approval to progress with this form of presentation from the co-ordinator for Joint degrees. He then sought support from a colleague with expertise in creating and using podcasts in an educational setting. A series of planning meetings took place between the researchers in the period November 2007 - January 2008 to plan a schedule for student briefing, training and identifying issues associated with ethical approval, submission and ensuring that the task retained the academic rigour, and demands of the course assignment while retaining a principle of equity of student experience in consequence to the selected alternative mode. Sound advice (Lamb & Johnson, 2007) was found in relation to supporting student production of podcasts.

Initial assignment briefing took place during the second week of the second semester. This briefing addressed the task, outlined the expectations within the criteria and explained the requirement that the presentation would be submitted as a podcast. The briefing also outlined the possible topics that the students might address as well as emphasising the open choice that existed for the students. A timeline was provided that outlined the assignment schedule. Additional advice was offered to the study group. This emphasised the nature of the research task, submission dates, and credit rating as well as reiterating that the required presentation was to be provided in the form of a podcast. Suggested study areas were offered as well as establishing that the study should be set in the context of the reforms currently underway in Scotland “a Curriculum for Excellence” (Learning and Teaching Scotland, 2008). The team recognised that no opportunity existed for discussion relating to the students research and so a 48 hour consultation period was written in to the task specification.

Written advice followed this initial meeting. The students’ research was to be carried out during 18 weeks. The key stages were outlined and supported with a timeline and an outline of the support that would be available from tutors and support staff. The requirements for ethical approval of student project and the intended use for our own research was emphasised at this point.

## **Confidentiality**

The confidentiality of the students has been maintained throughout this study.

## **Data Sources**

### **Podcasts**

Each of the podcasts that were submitted for assessment purposes provided a rich source of data. (Four students additionally prepared podcasts for use by pupils in the classroom and these will influence future studies as well as supplying data for another study.)

### **Usage logs**

All electronic communications took place in a dedicated partition of the programme intranet. This supplied data on the frequency, date and timestamp of each communication, and permitted tracking the direction and type of responses from each participant.

### **Written assignments**

These provided additional data relating to the scope of the study as well as the professional insights that were included in each report.

### **Questionnaire**

A short questionnaire was considered to be a suitable instrument for its ethical, design and processing qualities (Cohen et al., 2000). Pre-service teachers were entitled to withdraw participation at any point. A four point Likert scale was selected with opportunities provided for open responses. The question sequence related to the originating Benchmark Standards and included questions on the quality of support and perceptions of professional learning.

### **Student interview**

A personal interview related to professional and science learning was linked to preparation of a Professional Profile and included questions on the quality of support and perceptions of professional learning.

## **Findings**

### **Podcasts**

Table 2 indicates the duration of each of the podcasts.

Candidate Number	Duration
1	6m 54s
2	6m 56s
3	4m 49s
4	5m 37s
5	12m 28s
6	11m 02s

Table 2 Podcast duration

Table 3 shows the research topic chosen by each candidate

Candidate Number	Topic
1	Pupil perceptions of biology
2	Factors influencing subject choice
3 *	An evaluation of podcasts as homework
4 *	Pupil perceptions of podcasts in gaining wider scientific knowledge through a news bulletin
5 *	Incorporating ethical issues into science teaching practice
6 *	An evaluation of podcasts effective teaching tools in a lesson on forensic science

Table 3 Research topics

\* Note that four of the group researched significantly different aspects related to podcasting and this was acceptable in terms of the programme assessment requirements. They did collaborate to some extent in sharing podcasts that they had prepared for pupil use and these are located at SScipod (Muir, 2008).

Table 4 shows the grades awarded for the 4 components contained within assignment 3b

Candidate	Component 1	Component 2	Component 3	Component 4
1	S	S	U	S
2	S	S	U	M
3	S	M	S	M
4	S	S	S	M
5	M	M	M	M
6	M	M	S	M

Table4 Grades awarded for assignment 3b

Key M = Merit, S = Satisfactory, M = Merit, note that a system was applied for converting each grade into a numerical value.

## Usage logs

One hundred and one transactions took place during the discussion period. Of these six involved assignment submission and one related to a tutor submitting a podcast on behalf of one student who was encountering access difficulties.

Table 5 indicates the usage and type of transaction by each subject.

Candidate number	Questions	Responses
1	0	3
2	4	17
3	5	8
4	0	12
5	9	15
6	5	17

Table 5 usage and response type

## Assignments

The assessment criteria are reproduced below followed by the researchers observations.

- 1. In your written report, identify a suitable topic, research questions and methodology relating to your subject and justify these in terms of their professional relevance.**

All candidates met or exceeded this sub-criteria.

They all identified a suitable topic, provided research questions although in one case this was implied, included reference to a suitable methodology and supplied a professionally relevant justification.

- 2. In the course of the presentation, specify your research questions, described your methodology and show how your findings emerge from these.**

All candidates met or exceeded this sub-criteria.

They each provided research questions and were generally clear and we commended one for providing an “insightful and informed account”. In one case research questions were implied and in another they were inexplicit. They supplied suitable narrative on the chosen methodology and positive feedback indicated “driven by informed structure” and “clear and capable of replication.” Feedback provided on the findings suggested that three of the group had experienced difficulties in identifying and reporting their findings “some inappropriate conclusions”, “flawed reasoning at points”, and “findings needed more detailed description”.

**3. In the course of your presentation, draw on your practical experience in schools and on appropriate principles introduced in course material and other relevant reading.**

Four of the six candidates met or exceeded this criteria and the remaining 2 were graded Unsatisfactory.

Positive feedback was provided in relation to school experience; “Strong derivation from placement”, “Continual reference to and reflection on school experience”. The two students who had not overtaken this component made “no reference to course material and relevant wider reading” or “lacking depth of pedagogical principles from course materials, wider reading and research.”

**4. Deliver a professional, coherent and well-managed presentation which achieves stated Objectives.**

All candidates met or exceeded this criteria with all but one being awarded a Merit grade.

The podcasts were well managed and organised. Positive comments included reference to software mastery and possession of a good 'radio voice' as well as commending their contributing to the on-line discussion.

## **Student interview**

The students had all completed the survey by this point.

The interviews determined to seek clarification from the on-line survey about Question 6 “Have your pedagogical skills been extended?” and all but one agreed that this had been the case. The research provided “another way”, its “novelty” and “increased responsibility for learning”. “Podcasts are totally different, they maintained interest . . . provided interest . . . were challenging for audience . . . had relevance.” “The experience has provided me with added teaching skills and an approach that allows me to teach in a new way.”

Three students were uncertain about the impact on their understanding of school science (Question 7) and one was emphatic that this had not changed as a result of the study.

The students indicated during the interview that they preferred the podcast to traditional forms of presentation in the presence of peers and tutors and provided a variety of explanations:

*“Peers are a harder audience to a class of children.”*

*“There was less pressure (giving presentation)”*

*“More freedom to work at home and be creative”*

*“Discussion worthwhile, more formal”*

*“Less threatening”*



Two noted that preparation had taken “roughly the same time”. Some further differences were noted:

*“Problem receiving no prompts from an audience made me depend on using script more. I was less spontaneous during the podcast.”*

*“I couldn't have anyone in room while I was recording; (student 2) was the same.”*

## **Initial observations**

Based on the headings suggested by Chan et al. (2006), the authors offer the following observations. These observations are drawn from evidence collected by questionnaire and individual interview. The questionnaire and interview data have still to be fully analysed.

**Motivation:** The authors observe that the pre-service science teachers found the process challenging and rewarding. For example, all of the students listened to the podcasts more than once and four of the students reported listening to sections of the podcasts on more than one occasion. As, pre-service teachers, the students have already demonstrated a desire to pass on their own science knowledge and pupil podcasts give a new and potentially exciting way of achieving this. All six students reported that their understanding of potential uses of podcasts in schools have developed and would recommend using podcasts to other student teachers.

**Benefits of Involvement:** Pre-service teachers benefited from producing well planned, coherent and well organised podcasts to demonstrate their understanding of principles of learning and teaching. The course encourages professional reflection and creating the assessed podcasts that described their own action research findings appears to have assisted in this process with all six students claiming that creating and listening to the podcasts has developed their understanding of the principles of learning and teaching. Also, five out of the six said that the creation of the podcast had helped with their professional reflection.

**Skills developed:** The process of preparing podcasts has extended their professional learning in a variety of ways – base level technical competence in managing the software (all six thought their technical skills had been extended); pedagogically in identifying and supporting a teaching and learning resource (four out of the six believed their pedagogical skills had been extended); and professionally (five of the six believed their research skills had been extended). They also developed peer assessment skills.

**Lessons learnt:** The authors have learned practical lessons on how best to use podcasts to develop science understanding and to support the professional reflection of pre-service teachers. The students have learned about their own understanding of science as well as developing their understanding of learning and teaching (four out of the six reported learning more about school science and all of them have developed their understanding of what makes a good educational podcast).

**Suggestions for improvement:** The authors are confident that the approach will be transferable to a larger group of PGDE pre-service teachers. The expectation is that these findings indicate effective ways of supporting the production of podcasts by pre-service teachers and the use of podcasts as part of the assessment of pre-service teachers.



## ***Discussion and Areas for Future Study***

### **Podcasts – duration**

The duration of the podcasts had become an issue for two of the students we agreed to relax the specification. Given the pilot nature of the study we believed this to be a suitable compromise and did not wish to increase their anxiety, given the significance of the assessment to the degree classification. The duration range fell within acceptable parameters with a mean duration of 7 minutes and 58 seconds. They reported that they had listened to each podcast from start to finish or at least in part at least twice or more than twice. This indicates a significant commitment – over and above their engagement with a face to face presentation.

### **Podcasts – research topics**

The selected topics were representative of the areas selected by the PGDES students who were undertaking the same assignment through the conventional face to face approach. That 4 of the students further studied different aspects of podcasting (as homework, presenting topical science, ethical issues, or supporting forensic activities) is strongly indicative of the way in which they recognised the value of the technology as well as the potential for podcasting to contribute to enriching their classrooms.

### **Podcasts – student discussion**

Previous experience of Powerpoint based presentations suggest that student questioning and discussion following presentations is stilted and difficult. This is in contrast to the extremely high quality of online discussion that took place after the students' podcasts were posted.

### **Podcasts – grading**

The range of grading translated into percentage scores to contribute towards degree classification. The range extended from 50% to 88 % with a mean score of 69%. Component 4 provided compelling evidence to support our conclusions in relation to delivering a coherent presentation.

These scores strongly corresponded to the indicators from other areas of their programmes. Assessments were carried out by the tutors on-line and off campus and no disagreements occurred in the application of grading criteria. Although we concluded that the approach was a valid method of assessing the presentations further study is required in relation to applying the criteria as well as providing a tighter time specification for the presentation.

### **Usage logs**

The number and duration of the transactions far exceeded our expectations. Quantitative aspects relating to the number of transactions as well as their duration went beyond the comparable stage of the traditional face to face presentation. Qualitative issues relating to the depth of analysis, the socially supportive nature of these and the balance of questions to responses requires further analysis as do the transactions themselves.

## **Assignments**

The criteria and sub-criteria were applicable to the podcasts and provided the tutors with the opportunity to further interrogate the presentation. (This was an unexpected advantage.)

## **Student interviews**

The results indicate the students' perceptions relating to the value of using podcasts as an alternative to traditional presentations. This was provided useful triangulation.

## ***In conclusion***

- Pre-service science teachers found the process challenging and rewarding; significant additional commitment was evident in preparation and reviewing terms.
- Pre-service teachers prepared podcast presentations that described their own action research findings and in addition several made further use of the technology.
- Pre-service teachers delivered well planned, coherent and well organised presentations that demonstrated their understanding of the principles of learning and teaching.
- The process of preparing podcasts extended their professional learning in a variety of ways – base level technical competence in managing the software; pedagogically in identifying and supporting a teaching and learning resource; and professionally in relation to the Benchmark Standards for ITE.

## ***Further study***

Given these finding we believe the approach is transferable with a larger group of PGDE pre-service teachers.

We have initiated such as study with a cohort of seventy-six full time and part time students and twenty-four undergraduate students in all three sciences.

## References

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## **Appendix 1**

### **COURSE ASSIGNMENT 3B**

Project/Presentation

Credit Rating  
TS2

30 Credits together with Curriculum & Pedagogy for

#### **TASK**

You will carry out a small-scale research exercise related to your TS2. The topic for this exercise should be discussed with - and be approved by - your C&P tutor. The research should be carried out during your 2nd and/or 3rd teaching placements. The output from your research exercise will be in two parts.

- (a) A written report which should contain:
- a clear description of your chosen topic and a justification of it in terms of its professional relevance;
  - your research questions (3 or 4 at most);
  - your research method(s);
  - a brief outline of your findings.
- (b) An oral presentation on your research to your C&P group and two tutors. This should last no more than 20 minutes including 5 minutes for dealing with questions from your audience.

Your written report and your presentation will both be assessed.

#### **ADVICE**

You may find the following information helpful:

##### **Written Report**

Before starting on the research exercise you should discuss your proposed topic with your C&P tutor. You are asked to consider one element of your subject and to carry out a small piece of research on it (don't be over-ambitious!).

You should state clearly what your chosen topic is and should justify it in terms of its professional relevance. No more than 3 or 4 research questions should be identified. You should explain why these were chosen, what you found out and how you did so.

**Your report should be about 1,000 words.**

You should also provide a Bibliography, which will not be included in the word count.

## PRESENTATION

You are required to deliver a presentation on your research described above. In the course of your presentation you must specify your research questions and methodology, present your findings and, where appropriate, draw conclusions from these. The content of your presentation must reflect your experience in schools, appropriate principles introduced in course material and other relevant reading.

You will be assessed not only on the content of your presentation but also on presentation skills such as organisation, pace, fluency, linking between sections, dealing with questions, effective use of resources (although please note that we are interested in the **use** of, rather than the **number** of resources). See Criteria for Assessment (below).

## NOTES

- The general criteria for PGDE(S) must be met
- The written report should be word-processed in 12 point font with at least 1.5 line spacing.
- Do not exceed the word limits.
- Bibliographical referencing should follow normal conventions. A handout on bibliographical referencing is available from the Library. Any appendix material should be brief and should be included with the written report.
- If you require audio-visual or printed material for your presentation, you must consult your tutor well in advance of your presentation.
- Your presentation should not exceed 20 minutes in length. (This includes 5 minutes for you to deal with questions from the floor, where appropriate.) If necessary, your tutor will ask you to stop after the allotted time.

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## CRITERIA FOR ASSESSMENT

### Criterion 1 refers to the written report

- \*1. In your written report, identify a suitable topic, research questions and methodology relating to your subject and justify these in terms of their professional relevance.**

#### *Sub-criteria*

MERIT: In the written report, the topic is clearly identified and research questions and methodology are appropriately focused. Relevance to professional practice is clearly demonstrated.

SATISFACTORY: In the written report, the topic is identified and research questions and methodology are related to the topic. Relevance to professional practice is evident.

UNSATISFACTORY: In the written report, the topic is unclear and/or the research questions are vague and unrelated to the topic and/or the research methodology is inappropriate. There is little relevance to professional practice.

### Criteria 2, 3 and 4 refer to the formal presentation.

- \*2. In the course of the presentation, specify your research questions, describe your methodology and show how your findings emerge from these.**

#### *Sub-criteria*

MERIT: Strong coherence between research questions, methodology & findings is clearly evident throughout the presentation.

SATISFACTORY: The links between research questions, methodology and findings are evident and are demonstrated at appropriate points.

UNSATISFACTORY: The links between research questions, methodology and findings are not demonstrated.

- 3. In the course of your presentation, draw on your practical experience in schools and on appropriate principles introduced in course material and other relevant reading.**

#### *Sub-criteria*

MERIT: School experience, appropriate principles and wider reading feature prominently in the presentation

SATISFACTORY: School experience, appropriate principles and wider reading are referred to in the course of the presentation.



UNSATISFACTORY: There is little or no reference to school experience, or appropriate principles/wider reading.

- \*4. **Deliver a professional, coherent and well-managed presentation which achieves stated objectives.**

*Sub-criteria*

MERIT: The presentation is highly professional, i.e., well planned, organised and confidently delivered **and** the objectives for the presentation are stated and fully realised.

SATISFACTORY: The presentation is of professional standard, ie, organised and delivered appropriately and objectives for the presentation are stated and realised satisfactorily.

UNSATISFACTORY: Presentational skills are weak and/or objectives for the presentation are not stated or realised.

**MARKING**

The written report will be marked by your C&P tutor, with all Unsatisfactory scripts and a sample of Merit and Satisfactory scripts being cross-marked by the other tutor. Both tutors will attend and mark the presentation and a final grade of Merit, Satisfactory or Unsatisfactory will be agreed between them.

**MERIT AND UNSATISFACTORY**

To achieve an overall Merit for this assignment, students must be graded as Merit in **at least Criteria 1, 2 and 4 above**. In addition, students must be graded as Satisfactory in all other criteria.

An overall grade of Unsatisfactory will be awarded where a student is graded as Unsatisfactory in **any 2** (or more) criteria or where a student's submission fails to meet the General Criteria for Assessment.

A grade of Unsatisfactory will be awarded where a student does not submit a written report by the specified date.

A student who is graded Unsatisfactory will be required to:

- re-submit only the written report if one of only two Unsatisfactory grades is in criterion 1;
- re-present if **all** Unsatisfactory grades are in criteria 2-4;
- re-submit the entire assignment in all other cases.

Re-submissions cannot be awarded a Merit grade.