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## Task-specific short PowerPoints™ for effective off-campus learning in Diagnostic Radiography

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### ***Abstract***

This case study details the implementation of task-specific PowerPoint™ presentations for an undergraduate diagnostic radiography module in response to the first COVID-19 lockdown in the United Kingdom. A series of short, focussed learning materials was created over a two-month period to alleviate student anxieties and improve assessment literacy concerning evidence-based practice and research skills. Alternative file sizes were offered with optional embedded narration for time- or internet-poor students. Statistical tracking on the Blackboard virtual learning environment showed high levels of student interaction, with positive qualitative feedback and satisfactory impact upon assessment outcomes. A correlation between a lack of content usage and poor academic results could be inferred, with three students failing one or both assessments through reduced or absent use. Despite the benefits of weekly additional content, it was not possible to ascertain whether students viewed/listened to downloaded files. Furthermore, instructional presentations may encourage surface learning rather than a deeper comprehension. Recommendations include using video streaming platforms to provide meta-data on student interaction alongside periodic formative assessments for confirmation of comprehension. Lastly, this research recognises remote learning's potential to alienate students who prefer in-person teaching in a more sociable environment.

**Keywords:** Remote learning; assessment literacy; COVID-19; engagement.

### ***Introduction***

The coronavirus (COVID-19) has had a devastating impact on national mental health (Pierce et al., 2020) and financial performance (Office of National Statistics, 2020), and

has resulted in substantial loss of life in the United Kingdom. Students in higher education underwent unprecedented changes to their learning experiences during the first national lockdown (March-July 2020). Changes have included cancellation of in-person teaching, mass transition to online delivery (Watermeyer et al., 2021), and closure of university facilities and student accommodation. A variety of complex consequences have arisen worldwide, with students reporting difficult home learning environments (equipment or internet reliability) (Mpungose, 2020; Katz, Jordan and Ognyanova, 2021), competing responsibilities (childcare or home duties), and increased reliance upon the virtual learning environment (VLE) instead of in-person interaction (Almaiah, Al-Khasawneh and Althunibat, 2020).

This case study will focus upon the provision of short PowerPoint™ (Microsoft) presentations for asynchronous learning in response to the challenges listed above. The use of PowerPoint™ as an instructional tool has been highlighted by Baker et al. (2018) as being ubiquitous across university teaching. However, application of this learning resource to address time- or internet-poor home environments has seen little investigation. The context for this study concerns 33 students in their second year of BSc (Hons) Diagnostic Radiography at Canterbury Christ Church University within the Using Evidence module. This module's learning objectives included the development of research skills, critical analysis, and the appreciation of evidence-based practice. The module had two assessments: analysis of a scientific article using a critique framework and a research proposal concerning a radiography-related project. With the advent of the lockdown, 15 weeks before the submission of the assessments, the author developed a series of short task-specific narrated PowerPoint™ presentations. The intent was to respond to the challenging home environments and discombobulated tutor-student communication caused by COVID-19 disruptions. The intervention sought to reduce assessment anxieties and to develop assessment literacy. Quantitative and qualitative feedback for the module was obtained and shall be presented herein.

## ***Literature review***

The Using Evidence module relied upon blended learning, defined as 'face-to-face instruction with computer-mediated instruction' (Graham, 2006, p.5). The application of

blended learning within undergraduate diagnostic radiography is common within academic literature. Topics such as clinical governance (Messer and Griffiths, 2007), patient care (Bleiker, Knapp and Frampton, 2011), and radiation physics instrumentation (MacDonald-Hill and Warren-Forward, 2015) have all advocated blended learning as opposed to purely didactic teaching. Shanahan (2007) shares an affinity to this case study by developing a dedicated subsection of the Blackboard VLE with additional activities resulting in substantial improvement in student information literacy. The creation of online resources for increased student engagement is supported by Salmon (2013) who suggest that 'activities' also promote learner-centred, task or problem-based approaches to online learning. Such efforts relate to the notions of deep and strategic learning (Biggs, 1987; Biggs and Tang, 2011) where comprehension of concepts and fulfilment of assessment objectives are paramount for student success.

A defining feature of the additional learning content was the application of PowerPoint™ presentations. Lorimer and Hilliard (2009) provide a comparable example of online narrated PowerPoint™ slides being deployed within undergraduate diagnostic radiography, with the primary benefit being flexibility of both time and place of student engagement. More recently, anecdotal references are made to its use within radiography interpretation training or assessment studies (Winter and Lineham, 2014; McLaughlin et al., 2018). Despite the aforementioned studies, there is a lack of recent academic literature regarding the use and suitability of PowerPoint™ within undergraduate diagnostic radiography education.

## ***Methodology***

### **Content creation**

For this intervention, 13 short (7-16 slides) PowerPoint™ presentations were created over a two-month period to cater for different aspects of the Using Evidence module. Presentations were task-specific, with the aim of improving assessment literacy in three distinct areas; they delivered specific guidance for both critique and research proposal assessments, and in relation to the module's relevant literature. Content included the explanation of key terminologies related to research design and critical evaluation of journal articles. Wherever possible, examples were taken from current radiography literature and explicit reference was made to the module assessment brief. Presentations

were provided with and without embedded narration of each slide, providing alternative file sizes (~350 Kb to ~26 Mb) for asynchronous offline viewing and/or listening. Additional tutor support was available via one-to-one online meetings throughout the lockdown period.

## **Dissemination**

Presentations were uploaded onto the Blackboard VLE within a dedicated area named 'Using Evidence COVID-19 Learning Resources'. The Blackboard Ally feature allowed alternative formats for viewing on web browsers, e-books, and mobile devices as well as audio conversion of text (Blackboard Ally, 2020). Emails were sent to all students weekly to announce new PowerPoint™ presentations and to list previously uploaded material. Students were also offered the opportunity to request new presentation content, although none acted upon this.

## **Data collection**

Quantitative data was gained from two areas: student interaction with Blackboard materials and assessment marks for both assignments. Ethical approval for data collection was not required as its purpose was classified under evaluation and audit of module delivery. The statistical tracking feature on Blackboard was applied to collect data on student download patterns for the PowerPoint™ presentations, allowing both individual and group information on access frequency and dates. Descriptive statistics included access rate per day, percentage of students accessing content, and access frequency per month (up until the submission date). Assessment marks were compared to individual student interactions with the Blackboard content for correlation analysis.

Qualitative feedback was sought by two methods: a formal end of module evaluation questionnaire primarily reliant upon a Likert scale of agreement, and an informal student representative report generated by student discussion. Relevant statistical information was extracted from the former, whilst the latter was searched for specific comments related to the implementation of the short PowerPoint™ presentations.

## Results

Results indicate a positive student opinion of the short PowerPoint™ presentations with 100% of students completing the end of module evaluation selecting Strongly Agree (n=9) or Agree (n= 5) for online materials enhancing their learning. Free-text responses were also overwhelmingly positive with specific comments for ease of online and independent learning directly as a result of the intervention (Table 1). Download rates were higher for topics concerning relevant literature for the Using Evidence module, with a slight correlation between greater number of slides and frequency of downloads (Table 2). The greatest quantity of downloads occurred in the month preceding the submission dates for both assessments (Figure 1). There were high levels of student interaction across all presentations (≥91% of students), with only one student lacking interaction altogether. Marks across the student cohort were variable, although predominantly high (Figure 2). Average marks and pass rates for both assessments were slightly higher when compared to the previous delivery of the module. Three students failed one or both assessments, one of whom did not access the new learning content at all.

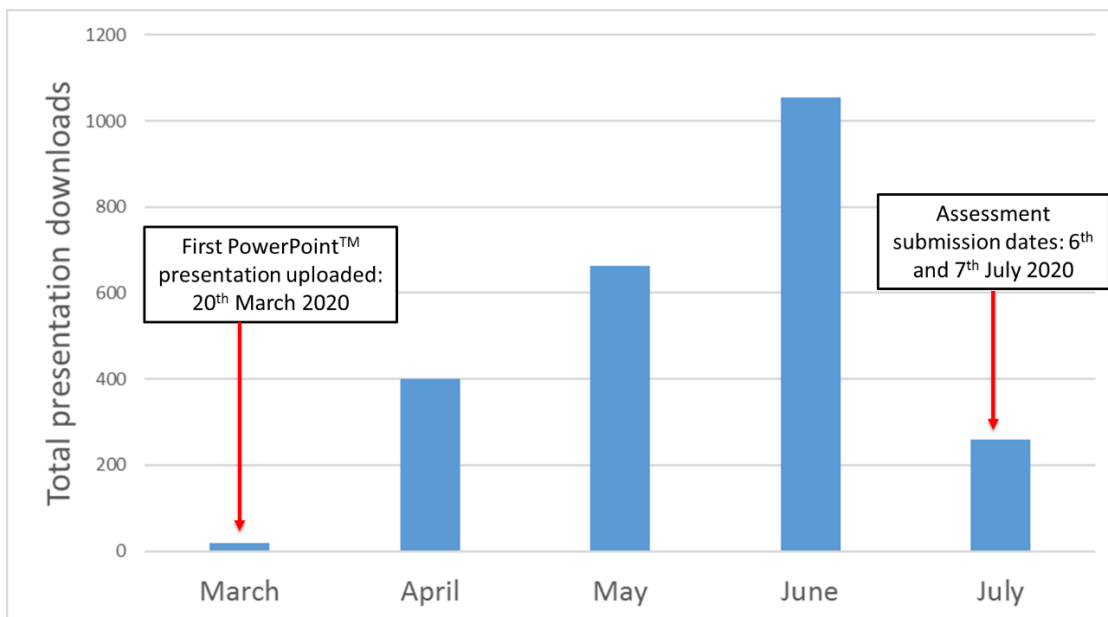
**Table 1. Qualitative feedback for short PowerPoint™ intervention during March 2020 lockdown.**

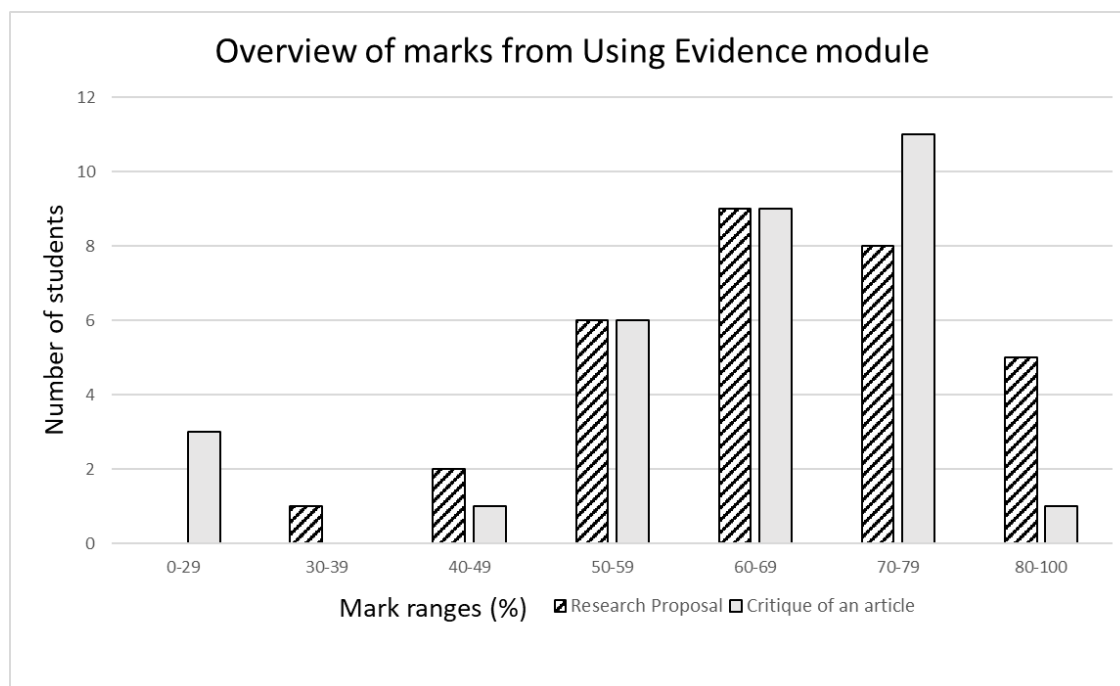
| A selection of module evaluation and student representative report feedback  |
|--|
| <p>“The mini-lectures were fantastic. They only included the relevant details and made all the content simplistic, which was very useful through the online learning portion of the year.”</p>   |
| <p>“His topic specific mini lectures regarding the essays were short and to the point, they were very helpful and enabled you to work independently and feel in control of your own learning.”</p>   |
| <p>“This module was challenging but nevertheless interesting, more especially due to COVID-19 as we were off campus. The presentations posted on Blackboard were extremely helpful and it was a lot of help having the lecturer on the other side of an email when I needed help.”</p> |

**Table 2. Quantitative data for student interaction on Blackboard Virtual Learning Environment.**

| PowerPoint presentation title                                       | Number of slides | Number of times downloaded | Average download rate per day | Percentage (%) of students using content |
|---|------------------|----------------------------|-------------------------------|--|
| Which ebooks to use for Using Evidence?                             | 16               | 268                        | 1.62                          | 97                                       |
| Which journals to use for Using Evidence?                           | 14               | 258                        | 1.63                          | 97                                       |
| Which 'other' literature to use for Using Evidence?                 | 13               | 245                        | 1.59                          | 97                                       |
| How to use the critique framework                                   | 12               | 182                        | 1.26                          | 97                                       |
| Critique - Example of using a quantitative critique framework on an | 14               | 162                        | 1.25                          | 94                                       |
| Critique - Qualitative critique framework example                   | 10               | 150                        | 1.28                          | 91                                       |
| Critique - Examples of 'poor' scientific rigour                     | 9                | 148                        | 1.26                          | 94                                       |
| Research Proposal - Title and introduction                          | 7                | 200                        | 1.32                          | 97                                       |
| Research Proposal - Providing rationale within your introduction    | 7                | 194                        | 1.26                          | 97                                       |
| Research Proposal - Writing the literature review                   | 8                | 180                        | 1.30                          | 97                                       |
| Research Proposal - Writing your aim                                | 7                | 147                        | 1.08                          | 91                                       |
| Research Proposal - Writing your methodology                        | 8                | 149                        | 1.08                          | 91                                       |
| Research Proposal - Ethical considerations                          | 9                | 151                        | 1.29                          | 94                                       |

**Figure 1. Presentation downloads per month.**



**Figure 2. Overview of marks from Using Evidence module.**

## Discussion

It was hypothesised by the author that the COVID-19 learning environment may lead to students adopting a surface learning approach in a non-strategic manner, principally due to an interruption in teacher-student interaction. Biggs and Tang (2011) outline that students who learn in this way focus upon the assessment as an obstacle rather than a development opportunity, learning enough to pass at the minimum requirements. Non-strategic learners are disorganised, lack adherence to the assessment criteria and ignore underlying teacher preferences (Biggs, 1987). The intervention aimed to encourage deep and strategic learning by addressing the main areas of assessment concern: key terminologies, assessment structure, and topic-specific content. Explanations and examples of evidence-based practice within diagnostic radiography sought to illustrate the application of theory into clinical practice. The education of research-led practice at an undergraduate level is considered pivotal to the progression of the profession (Society of Radiographers, 2016) and therefore an essential area for pedagogic investigation.

It was hoped that by providing regular new content during the lockdown period (March-July, 2020) the teaching intervention would improve assessment literacy and facilitate greater comprehension. However, the format of taking students step-by-step through the

assessments may not have fostered deep learning because of the instructional manner of teaching used. Students learnt how to pass the assessment, demonstrating assessment literacy, but perhaps did not learn the meaning or theory behind concepts associated with deep learning (Beattie, Collins and McInnes, 1997). This poses the greatest limitation on this case study, as the available results fail to explore whether students developed deeper learning as a result of the intervention. Nevertheless, pass rates were high with students exhibiting effective critical analysis and use of relevant literature to support their claims. Furthermore, failures were positively correlated to poor or absent interaction with the new content. Future research may serve to establish a link between task-specific presentations and deep learning. For instance, deliveries of the module could integrate regular formative assessments or interactive content on the VLE to better track students' understanding.

Results demonstrated high levels of repeated downloads for the new content (n=151-268) with consistent interaction across four months (Figure 1). The qualitative feedback fails to explain download habits, but access rates followed a predictable upward trend leading up to the submission dates. The presentations were provided in a file format rather than a streaming video to allow students to download and view at a time convenient to them. This strategy also aimed to overcome internet reliability issues, using small file sizes for quick download times and low internet burdens. A limitation of this approach was the inability to ascertain whether students used (viewed/listened to) the downloaded presentations. Alternative delivery methods such as Blackboard Collaborate are available and may assist in tracking student interaction, quantifying time spent viewing the content, and therefore providing meta-data on content usage by students.

The first COVID-19 national lockdown imposed tremendous challenges for both students and academic staff. The additional content deployed by the author used the principle of inclusive practice to remediate potential areas of learning deficiency. Regular new online content may have provided sustained interest in the module as well as increased tutor presence (albeit remotely) in a time of separation and remoteness. Despite these efforts it must be recognised that remote learning may alienate portions of the student population. Previous research concerning mature diagnostic radiography students has highlighted a preference for in-person teaching due to unfamiliarity with information technologies (Williams and Decker, 2009). Furthermore, students may feel isolated during distance learning, experiencing a lack of community and the associated informal cues from



teachers and pupils alike (Croft, Dalton and Grant, 2015). Educators in higher education must not underestimate the importance of personal interactions with students who are not sufficiently digitally literate or prefer more sociable learning environments.

## **Conclusion**

The challenges COVID-19 has posed upon higher education have been considerable, with wide-scale transition to online teaching. The teaching intervention presented within this case study involved the creation of short task-specific PowerPoint™ presentations to increase assessment literacy and reduce student anxiety. Whilst simplistic in its approach, the presentations were designed to be both small in file size and time investment for quick and direct assessment guidance. Both qualitative and quantitative data provide evidence of a positive impact, with high levels of interaction and assessment pass rates. Limitations include the inability to determine whether students viewed the presentations once downloaded or if they comprehended the content. Furthermore, it is not possible to ascertain from the available results whether the intervention alone instigated student attainment of learning objectives, although an absence of engagement led to the failure of assessments by one student. A cause for concern was whether the task-specific presentations fostered a surface-learning approach due to the instructional teaching strategy employed. Future implementation of similar learning content could employ video streaming alternatives with statistical tracking and concurrent testing or activities for regular assessment of student understanding. Implications for teaching practice include using additional targeted online content where required, while accepting the continued importance of in-person, sociable teaching.

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