THE USE OF DIGITAL ASSESSMENT GUIDES TO IMPROVE STUDENT GRADES AND SATISFACTION WITH THE ASSESSMENT PROCESS

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Abstract

This study assesses the use of digital assessment guides (DAG) to improve student attainment and satisfaction with the assessment process. The value of DAG comes in the 'just in time' nature of the resources, giving students the key information not only at their point of need, but also at their point of *understanding*. The study saw DAG introduced to 230 students across three modules on an undergraduate computing degree in a UK university. The results demonstrated an improvement in student grades, and students were highly satisfied with the DAG, noting the positive affect they had on their learning and module outcomes.

Introduction

This study emerged from the lecturers taking part in the study becoming increasingly overburdened with the number of emails received from students for clarification on assessment elements. Before digital assessment guides were conceived of, the lecturers in question had tried a number of avenues for reducing the numbers of assessment queries. These included:

- Asking students to submit questions at the start of the assessment and then publishing a question and answer sheet that could be referred to when the students were working on the assessment.
- Publishing answers to emailed questions to the whole cohort on the virtual learning environment (VLE).
- Discussing the traditional paper based assessment guide in class in an attempt to clarify any misunderstandings face to face.

Despite these interventions, the emails continued to flow, often asking questions already answered in class or on the published answers to questions. The number of emails increased steadily towards the assessment due date and were especially high in the week before submission.

It was clear that students were emailing their questions at point of need; they asked questions about individual sections as they were working through the assessment (as expected) and many suggested that the discussions in class when the assessments were introduced were very useful but quickly forgotten. This last point highlighted the idea that these 'useful' explanations of what is expected were really required by the students at their own point of need. Students should be fully informed about each of their assessments, the expectations and how it fits into their overall learning experience. Increasing their understanding of these factors through clear communication is "not only an ethical practice but also good pedagogy" (Suskie, 2009, p. 42).

This is how the idea of introducing digital assessment guides was conceived of. The DAG would record the lecturer talking through the requirements for each section of the assessment, incorporating the usual clarifications that were requested by students. The DAG were created using iSpring, which allows the creator to clearly structure the presentation so students could easily and quickly move to the section of the assessment they were working on at any given time. Any package that allows the recording of audio over animated slides would be suitable. The DAG were provided in addition to the traditional written assessment booklet/guide. The idea was to give the students access to the tutor description of the assessment sections at their point of need. It is important to note that whilst we called the intervention *Digital Assessment Guides*, the intervention is not related to the field of digital assessment, as the guides produced were simply a support mechanism and as such do not include any elements of digital assessment.

Research Aim

The aim of this study was to analyse the effectiveness of using a DAG to improve student satisfaction with the assessment process and their overall grade. The research questions were:

1. Can the use of digital assessment guides improve student grades?
2. Can the use of the digital assessment guides improve student satisfaction with the assessment process?

Literature Review

The authors initially set out to situate the DAG in current similar just in time approaches in higher education. However, the literature search highlighted that just in time or point of need approaches, whilst common in industries of all types, are not common in higher education (HE) for assessment purposes. As a result, the focus turned to the guiding principles behind the creation of the DAGs. Colleagues of the lecturers using the DAGs suggested that they may simply be 'spoon-feeding' students and that giving a structured description of expectations would reduce creativity. However, it was felt that the DAG was more of a scaffold to the assessment process. It was easy to see why colleagues may have this belief as the DAG could be viewed through the lens of different learning theories. Stewart (2012) noted practical applications of learning theories. His *principles of pedagogies* specify different approaches within each theory, and each specified approach has clear alignments with the use of the DAG.

For example, for behaviourist perspectives Stewart notes having "an emphasis on the teacher specifying the structure, content and delivery of learning activities" and "Individualised programmes that allow students to work at their own pace" (Stewart, 2012, p. 5). He suggests constructivist perspectives posit "the role of the teacher as a guide, providing 'scaffolding' to learning to ensure the student has the requisite knowledge, skills and support to negotiate a new piece of learning, and prompting through questioning or modelling" (Stewart, 2012, p. 11). Cognitivist perspectives Stewart notes use a variety of mixed media in teaching to accommodate sensory preferences and "present concepts in varied ways, for example in constituent parts and holistically, to cater for different cognitive styles" (Stewart, 2012, p. 10). Finally, social and situated learning perspectives Stewart notes allow identification of what students can already do and supporting learning in the zone of proximal development (ZPD) (Stewart, 2012, p. 14).

Whilst it is clear to see how each of these learning theories can be related to the DAG approach, it is more difficult to justify one approach having facets of all of these disparate theories. The theory that most suits the DAG approach is that of social and situated learning perspectives, especially related to the ZPD. The *zone of proximal development (ZPD)* is a concept introduced by Vygotsky (1978) and is the difference between what a learner can do without help and what they can do with it. The main focus with the ZPD is that with more capable peer or teacher assistance, students are able to operate at a higher level than they could on their own, and this enables them to learn to operate independently at this level (Wass & Golding, 2014). Wass and Golding (2014) introduce *scaffolding* as the element of assistance (Figure 1). This clearly fits with the DAG approach, as the tutor in this case is not 'assisting' in person, but using a tool (the DAG) to scaffold the students' learning at the point of need.

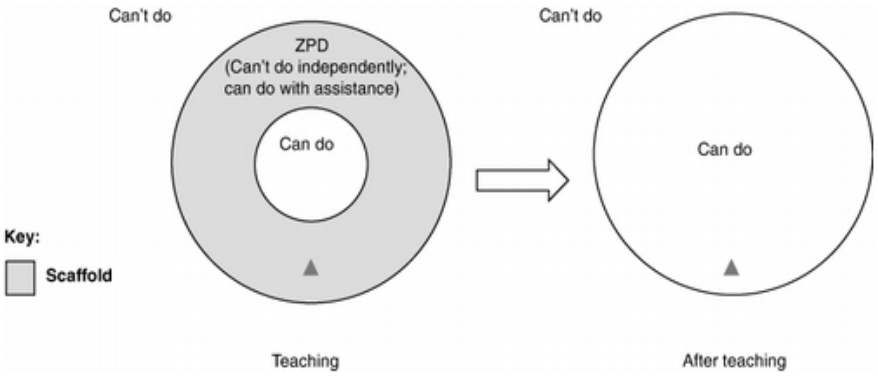

Figure 1. Teaching – students are scaffolded to complete a task (triangle) that is within their ZPD. After teaching – students can do this task independently (Wass & Golding, 2014, p. 676).

The scaffold in question here effectively reduces the students' cognitive load. Cognitive load theory suggests that "effective instructional material facilitates learning by directing cognitive resources toward activities that are relevant to learning rather than toward preliminaries to learning" (Chandler & Sweller, 2009, p. 293). The DAG in particular helps to reduce extraneous cognitive load, which is the type of cognitive load that is said to be under the control of instructional designers.

Research Design and Methodology

This mixed methods case study analysed whether a DAG can be used to improve student grades and satisfaction with the assessment process. A concurrent mixed methods design was used (Creswell, 2014). In this study quantitative and qualitative data from a student survey sent to all students taking the three modules that are part of the study was used to assess students' perceptions of the use of DAG, and whether they felt the intervention had any impact on their satisfaction with the assessment process and their grades. Qualitative data from a focus group also explored students' perceptions of the use of the DAG.

Methods

The digital assessment guides were introduced in three traditional face-to-face modules, one first year module and two third year modules. The DAGs were introduced for the second assessment for all modules, meaning students had completed the first assessment without a DAG. The DAG did not replace the traditional paper/written assessment guide, but was presented as a supplementary guide. The students were shown the DAG as the second assessment was introduced; it was played in full in class so students could immediately see the value of using it. A link to the iSpring DAG file was placed on Blackboard so students could access the recording at any time. The iSpring file format allows access from all devices and platforms.

As shown in Figure 2 the DAG has a clear structure allowing students to select the section they want to view on the right-hand side, or just listen to the whole guide in full. They can also pause and replay each section as they wish.

Figure 2. Screen shot of one digital assessment guide (DAG).

Focus group. The focus group consisted of five students, all of whom self-selected after a call for participation in the final seminar. The focus group was recorded and transcribed verbatim. The data analysis method chosen for this study was thematic analysis, incorporating the data-driven inductive approach of Boyatzis (1998). This method related to research question two.

Survey instrument. The survey consisted of fifteen questions using a mixture of open and closed questions. The survey was distributed online in the final classes, of the approximately 230 students introduced to the DAG, 50 students chose to complete and submit the survey anonymously. The qualitative data from the open-ended questions was analysed in the same way as the qualitative data from the focus groups, using the same process of thematic coding. This method related to research question two.

Collection of student marks. Marks from students using the DAG were collected and compared to assess any change in attainment. This was in order to answer research question one.

Results

Quantitative and qualitative results are presented here, with the discussion of these in the next section.

Quantitative Results

Quantitative results inform both research questions in relation to improving student grade (RQ1) and satisfaction with the assessment process (RQ2). Results demonstrated:

- 100% of students agreed that their experience of using the DAG was positive.
- 96% of students accessed the DAG outside of the classroom.
- 96% of students felt they produced a better piece of work due to the DAG.
- One DAG was accessed 551 times by just 29 students.
- The structure of the DAG meant that 94% of students chose to dip into it at their point of need.
- Only one module used had student grades that could be compared due to changes in assessment between years. This module saw a doubling of the numbers of students achieving a grade over 70% (of a class size of 35-40). Given the small number of student within this module, no detailed statistical analysis was undertaken.

Qualitative Results

The qualitative results answer research question two in more detail: Can the use of the digital assessment guides improve student satisfaction with the assessment process? The analysis of the qualitative survey results highlighted six themes. The themes were: clarification of requirements/more detail in DAG, the value of accessing the DAG at point of need, accessible, preference for audio description, time saving and structure. The numbers of comments coded under each theme is shown in Table 1. Some example comments are also shown to clarify each theme.

Table 1

Qualitative Survey Results

Code/Theme	No. Instances	Example Student Comments
Clarification of requirements/ more detail in DAG	60	"Made it easier to know what the lecturer wanted" "It explained in detail how to tackle different parts"
The value of accessing the DAG at point of need	61	"It helped with the coursework as I would be able to skip to the slide that held the information I needed"
Accessible	18	"I liked that it was accessible whenever we needed it" "I have hearing impairment so sometimes miss important things in class, being able to listen over at home ensures I don't miss key points"
Preference for audio description	23	"..easier to understand that reading" "it's in the words of the lecturer so its easier to understand"
Saves time	6	"Provided help again and again without having to go to the tutor over and over"
Structure	9	"I like the way you can view the slides (…) and you can rewind fast forward and play as many times as you please"

Table 2

Focus Group Results

Code/Theme	No. Instances	Example Student Comments
Clarification of requirements/ more detail in DAG	4	"I only used it towards the end of the assignment but when I did it answered a lot of the questions I had" "I found that it did explain it (the assessment) a lot more than the (written) assessment guide. It explained exactly what was wanted"
The value of accessing the DAG at point of need	10	"I went back to the parts I needed when I needed them"
Structure	1	"it broke the assignment down in to parts"
Preference for audio description	2	"It gives more sense to what's going on so when you read a line it is just a statement but when someone is saying something you can interpret it and get the meaning behind it easier"
Not having to rely on memory or notes	3	"I knew as soon as I got home what you said would be gone" "Even when I take notes sometimes I look at them and they don't make sense"

Discussion

The questionnaire and focus group results were collected and analysed separately, with the results then merged. On merging the two sets of results, it is clear to see that they are complimentary, with overlaps in the thematic analysis of both the qualitative questionnaire answers and the focus group discussions (see Tables 1 and 2). These overlaps included the clarification of requirements/more detail in DAG, the value of accessing the DAG at their point of need, the value of the structured approach to the DAG and the preference for the audio description of requirements. The only additional element that came out of the focus groups that was not apparent in the questionnaire results was how the students valued not having to remember the tutor's initial description of requirements, as some felt their understanding, memory, and/or notes were letting them down.

One element that is particularly important to note is that the research has demonstrated the importance of using the DAG as an additional resource alongside the traditional written assessment guides/booklets. Whilst the DAGs were clearly loved and welcomed by most students, many noted that they used both the digital and written guides in conjunction with each other. This fits in with the cognitivist perspectives noted in the literature review in relation to providing choice to students. Another reflection from the focus groups was that those students not present at the initial class where the DAG was introduced did not appreciate what it was or its value. This highlights the importance of ensuring all students are aware of it and how it may enable their study.

To re-assess the initial research questions. *Can the use of digital assessment guides improve student grades?* This was demonstrated as a success as results show that there was doubling in the numbers of students achieving the highest grades (above 70%). *Can the use of the digital assessment guides improve student satisfaction with the assessment process?* This can also be argued as a success. Students were overwhelmingly in favour of the use of DAG, and the results of both the quantitative and qualitative analysis demonstrate this fact. The thematic analysis was important as it allowed the researchers to pull out the key aspects that the students felt were actually improving their satisfaction with the assessment process when using the DAGs.

Discussion Related to Learning Theories

Using Stewart's (2012) *learning perspectives* identified in the literature review, we can see how the DAG aligns with these perspectives and how the results back up the authors' initial identification of how the DAG could help. There were many student comments regarding the helpful structuring of the content and clarification of what was required, which aligns with the behaviourist perspective. The DAGs also facilitate step-by-step attainment by allowing students to use the knowledge gained in classes to add to explanations given in the DAG. This also allows students to work at their own pace as they can revisit the guide at a point suited to the pace of their work.

The role of the teacher as a guide who provides scaffolding to learning to ensure the student has the requisite knowledge, skills and support to negotiate a new piece of learning supports the constructivist view (Stewart, 2012, p. 11). One issue that was apparent from the student comments was the issue of remembering the initial explanation of the assessment given by the tutor, with comments such as "I knew as soon as I got home what you said would be gone." The DAG as a scaffold is a clear constructivist benefit for the students, and it also suggests the cognitive load reduction suggested in the literature review is a factor.

The main benefit felt by the students appears to be tied to the *requisite knowledge* element of the above statement from Stewart (2012), introduced in the literature review. If we consider the initial explanation given to students in week one regarding assessment outcomes and expectations, it is often very difficult for them to effectively understand and apply that explanation as they do not yet have the requisite knowledge to build a clear mental picture of the requirements. For example, one of the modules DAG was introduced into was a third year project management module, with terms such as *PRINCE2*, *Product Breakdown Structures* and *Product Descriptions* all described as requirements for the assessment. However, it is not until the students have the associated seminar that they start to understand these terms in context and in any detail. Therefore, the DAG provides the scaffolding necessary to allow students to access these detailed descriptions at a point when they have the most understanding of the necessary concepts. Indeed, the data supported the fact that students were dipping in to the DAG at multiple points, with one DAG being accessed 551 times by just 29 students on one module. The zone of proximal development (ZPD) is supported as learning occurs through the DAG when the student is assisted by the tutor with explanations of requirements or concepts that are outside the students' skill set at any given moment, therefore *scaffolding* the process (Wass & Golding, 2014).

Finally, the qualitative themes such as "not having to rely on memory or notes" and "the value of accessing the DAG at point of need" link back to Chandler and Sweller's (2009) suggestion that directing resources toward activities that are relevant to learning reduces their extraneous load. The DAG, therefore, becomes an enabler or scaffold for student learning and attainment.

Conclusions

Overall the outcomes of the DAG project were very pleasing. Emails and assessment enquiries dropped significantly for the tutors using the DAG approach. Student results improved, and students started to ask other tutors in the department to provide digital assessment guides for their modules. As suspected, the detailed explanations of what is expected in assessments were required by the students at their own point of need. The results demonstrate that they used the DAG with this 'dip in' approach, which in turn supported their understanding of requirements and ultimately led to improved grades. Students should be fully informed about each of their assessments, the expectations and how it fits into their overall learning experience; the DAGs provide this support.

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