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The impact of integrating technology into students' presentations on peer evaluation in higher education

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Abstract
This study investigated the impact of technology in presentations on students' perception of quality. Students peer reviewed presentations and two external raters evaluated the presentations based on a rubric adapted from Savory (2009). Students reviewed activity using two assessment instruments: a seven-point attitudinal scale and a 1–5 ranking scale. The study utilized a mixed-methods, embedded QUAN:qual design, where statistical analysis of Pearson Correlation coefficient was paired with qualitative description to discuss the data gathered. The findings showed that students' scores on the attitudinal scale and their holistic rankings correlated positively with the degree of technology employed in the presentations. The greater the integration of technology in a presentation, the higher the peer rating. However, the external raters' evaluations did not generally accord with the student-raters'.

Keywords Technology · Student perception · Peer evaluation · Pedagogy · Attitudinal rankings · Teaching and learning

1 Introduction

The use of technology is becoming increasingly ubiquitous in every-day life. There is little surprise, therefore, that this dependence has found its place in the classroom, or that the utilization of technology in the classroom has brought with it a host of controversies, a considerable number of which was centered on its effectiveness as a pedagogical tool. This study takes place in a research

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intensive university in the United Arab Emirates. From a technology in education perspective, the UAE represents a familiar setting. The increased interest and emphasis on the use of technology in the classroom provides a platform for discussion and review. As in many countries (Mugo et al. 2017) governments are adapting their national curriculum as a result of, or to improve technology integration. All students at the university have access to formal training on presentation skills and presentations are an integral part of the institutional assessment procedure.

This paper highlights the issue of technology in the classroom but from the innovative approach related to students' assumptions about technology and their high expectations of their evaluations based on their use of technology. In fact, arguments and disagreements about grades are very common in the educational setting. Such disagreements mostly transpire when a student is not satisfied with his/her grade, and they become perennial when the marking criteria are not set beforehand, which gives room for different interpretations vis-à-vis the constructs that are the foci of marking. At the other end of the spectrum, disagreements about the grades are not very common when the marking criteria are outlined and explained via the employment of various assessment tools, inter alia: holistic and analytic rubrics, and checklists. The idea behind the present research was triggered by one such argument that took place between one of the authors of this paper and one of his postgraduate students in the Masters of TESOL program.

The student was not happy about her presentation grade. When asked about the reason behind her dissatisfaction, she said, "my presentation was interesting, and everyone liked it" – implying, except you, professor. When asked about why she thought the presentation was interesting, she said she had employed a plethora of technology, such as animations, videos, and sight-catching images. The question that came to mind at that point was this: Do students have assumptions linking technology and 'interesting' presentations to high grades, even with the presence of a clear, straightforward criteria of evaluation? This question was the departure point for the present paper. The researchers interrogated literature to find out if such assumptions about technology were received with sufficient rigor in research, and they found that such an investigation was almost absent, despite the vast amount of research conducted on technology in the educational setting. With the belief that EFL learners' assumptions about the relationship between technology and grades in presentations is a topic that merits consideration, the present study was conducted. In essence, then, this paper attempts to address practical challenges in teaching practice and respond to student perceptions of both the inclusion, and value, of technology as a grade-determining factor. The authors are faculty members and the students, postgraduates at the same institution. Ten Masters and PhD students were asked to deliver PowerPoint presentations during class and were encouraged to be as creative and innovative as possible in their use of technology. The research design included the use of three separate instrumentation tools. Student presentations were peer-reviewed by classmates, using a combination of an attitudinal and a ranking scale instrument. In addition, four external raters, two for each class, were asked to evaluate the ten presentations using the presentation rubric assessment tool.

1.1 Research aim

The aim of this paper was to better understand the correlation between the use of technology in presentation tools and the perception of quality. Findings revealed that students directly associated the use of technology with the quality of a presentation. This was in contrast to the external reviewers and therefore identifies a key issue involving the value and challenge of incorporating technology as a relevant and valid pedagogical tool. The paper was driven by attempts to answer the following question:

What is the impact of the degree of technology employed in postgraduate EFL students' presentations on their peer's judgment of these presentations?

Sub-questions:

a. What is the correlation between the degree of technology employed in the presentations and the student-raters' attitudinal evaluations of the presentations as boring or interesting?
b. What is the correlation between the degree of technology employed in the presentations and the student-raters' rankings of the presentations?
c. What are the external raters' evaluations of the presentations based on using objective rubrics?
d. What are the students' assumptions revealed by comparing the evaluations of the student-raters and the external raters of the presentations?

2 Literature review

2.1 Theoretical framework

An exploration of literature reveals that the use and adoption of technology in teaching has been the subject of much debate. This research exercise involved investigation for a relevant theoretical framework to underpin our analysis. Among the key approaches and frameworks of Rogers (2003) Diffusion of Innovation Theory and the Ajzen and Fishbein (2005) Theory of Reasoned Action, Davis' (1989) Technology Acceptance Model (TAM) holds the greatest relevance and value for our research study. The core elements of TAM are the perceived usefulness and the perceived ease of use and the approach has been used extensively to investigate behavior and technological acceptance and adoption. Davis (1989) defines these characteristics as the belief that using a particular system or technology will enhance the user's performance and secondly, that it will reduce the effort needed to complete the task. These two elements are seen to be impacted by a series of external factors, such as social, cultural and political, determinants. In this regard, this approach provides the ideal foundation for our investigation. The use of technology is seen, as indicated above, by students to be both a necessary and expedient addition to classroom activity and assessment. Surendran (2012) provides an in-depth review of relevant literature and outlines the development of this approach over time. As factors such as theory of planned behavior (Taylor and Todd 1995); compatibility (Agarwal and Prasad 1998); and experience, self-efficacy and social influence (Kim and Lim 2001) were combined with the original theory, the debate has evolved and incorporated a plethora of variables.

Our research is situated within this theoretical framework and we investigate student perceptions regarding usefulness and value of technology use in presentations. We draw upon elements of activity theory (Barker and Sparrow 2016; Turney et al. 2009; Portnov-Neeman and Barak 2013; Davies et al.2009; Davis 1989) as a conceptual framework for investigating student perceptions. In particular, we seek to incorporate the focus on tools, rules and community as determining factors that impact both use and interpretation of technology in the classroom. The primary driver behind this foundational approach is the correlation between perceived value and the interplay of individual approach, structural constraint and community understanding.

2.2 Use of technology in teaching

The use of technology in education can be a contentious issue. The pace of development and ubiquity of technology in every-day life, naturally creates a significant degree of expectation regarding its integration into the learning process. Research indicates that teachers' educational beliefs about teaching and learning, about students, about pedagogy, and about the role of technology strongly influenced the integration of technology. (Garthwait and Weller 2005; Kim et al. 2003). Opinion is divided on this issue and it is difficult to quantify how effective technology has been on improving teaching and learning. (Ferdig 2006; Jones and Paolucci 1998). Kvavik et al. (2004) argue that the development of technology in higher education does little to improve learning. Kirkwood (2009) states that e-learning "has tended to replicate or supplement existing academic practices." (p.113), rather than support and develop innovative pedagogical approaches. Fleischer (2011) reports that 'digital devices do not necessarily improve learning. Wang (2006) states that "multimedia is a learning tool that allows learners to organize, represent and construct knowledge in multiple modalities that include text, audios, graphics, animation and videos" (p.316). Quinones (2010) states that "as educators, we know that students learn better and faster when they are actively engaged in their learning. Digital media can be a great vehicle for student engagement with classroom technology." (p.28). Achievement outcomes from most large-scale digital implementation projects report modest or mixed results. Harper (2018) in his empirical review of education technology literature, found that in some cases, "the presence of technology without sufficient structure or limitation from the teacher was problematic." (p.220).

Qing (2007) argues that "student' and teachers' beliefs about technology may affect their adoption of the tools which directly contributes to the establishment of a technology-enhanced environment." (p.378). Perception, therefore, becomes reality and drives both expectations and value. There is significant research, however, indicating that embedding and integrating relevant and appropriate technology into classroom practice, can support student engagement and interaction (Maier and Warren 2000; Sanders 2006). The 2017 US Department of Education's report clearly states that technology can be a useful tool, but only when implemented with purpose. "For any technology solution to have a transformative impact on student learning and success, it must have as its foundation the specific goals, needs, and interests of the students themselves." (p.8). Technology is a tool, not the answer to the future of education or higher learning. Successful integration is driven by a fundamental understanding of value and purpose.

The role and use of technology in the classroom is becoming second-nature. Hamidi et al. (2011) argue that "preparation for applying the technology and awareness of technology to enhance the quality of the students learning should be one of the teacher's basic skills." (p.370). What is needed, however is continued analysis as to impact and relevance. While there are empirical studies examining the role and impact of technology in classrooms (Harper and Milman 2016; Liu et al. 2014; Penuel 2006) these have largely focused on the effect of technology on student achievement and motivation. A 2015 study by Hegedus et al. investigated 606 students in US high schools and determined that the use of technology in teaching and assessment 'increased student engagement, improved student-teacher interaction and promoted higher-order problem solving.' This study, according to Murphy (2016) focused on the improvement of the student and did not take into account the role of the teacher as a factor of analysis. Research demonstrates that educational technology tools can, and do, promote and support student learning and develop career skills (Clarke et al. 2001; Hunt et al. 2004; Kirkgöz 2011; McCabe and Meuter 2011; Young et al. 2003), more work is needed to discuss, review, and analyze the question regarding quality and value of integrating technology in student activity. Is it a substitute for depth of approach, or a natural response to the world in which students operate?

2.3 Student perceptions of technology

Oye et al. (2012) examined the use of an e-learning model to determine the acceptance of e-learning technology in an academic setting. The study focused on students' use of e-learning and the impact to their performance and found a positive perception of e-learning is vital to support the actual use of e-learning in classes. Interestingly, although the perception of e-learning influenced the use of e-learning, its implementation had a direct impact on academic performance. Lumadi (2013) suggest that e-learning has a significant influence on the performance of students as, in their study, e-learning teaching consistently performed better than traditional teaching methods in terms of student feedback. Harandi (2015) examined the relationship between e-learning and students' motivation in Tehran Alzahra University and concluded that e-learning has a direct impact on student motivation.

Milliken and Barnes (2002) conducted a review of literature and presented the dichotomy at play between perception and reality. They posit that "technology has become the new, intangible version of the podium which to hide behind" and that there is a decided "lack of concrete evidence that technology based presentations enhances the academic performance of students." (p.5). The use of technology is 'understood' as both good and valuable but not necessarily why, or indeed how, this is the case. Henderson et al. (2017) argue that we should consider and "recognize the difficulties that universities and students face in making 'good' use of digital technologies." (p.1568). The authors further highlight "the extent to which the use of digital technology to visualize teaching content could be said to constitute 'good' learning is questionable." (p.1576). Psaltou-Joycey and Kantaridou (2011) posit that the student preference for visual modes of learning constitutes a relatively unimaginative comfort zone. They argue that the use of technology in teaching materials can be seen to be a 'closure-orientated' study practice as opposed to a more open-ended approach to knowledge development.

From the student perspective, there is significant literature available to support the understanding of adoption and integration. Garcia et al. (2012) investigated student perceptions of the use of technology in the classroom and found that it did indeed increase participation and motivation as "students can freely express their ideas in innovative ways.... they preferred using technology to present their ideas rather than writing papers and doing more traditional projects." (p.69). Jesson et al. (2018) explain that "ubiquitous digital access has been associated with opportunities for increased learning-focused time, with a corresponding increase in students' production." (p.184). Özad and Kutoğlu (2004) identified that students tend to make use of visual aids in their presentations to facilitate presentation of their ideas, to get the attention of the audience or to feel more confident and relaxed during their presentations. Geiger et al. (2010) conducted a qualitative case study in Australia and determined that using technology in a blended learning model promoted collaborative interactions between teachers and students. The research demonstrates the perceived value of presentations and the integrated use of technology but is less clear as to the intrinsic value of this approach, or the extent to which this has simply become the new norm for information dissemination. Peart et al. (2017) identify the value in conducting further research of this nature. They state that, "an understanding of student perceptions of different TELTs (technologies) could be of benefit for a number of reasons; (i) identification of shared characteristics between well perceived TELTs may help predict what tools are likely to work in future, (ii) targeting particular types of TELTs may act to reduce staff anxiety by reducing choice and preventing over saturation with TELTs, (iii) contribute to the planning of departmental and institutional TEL strategies." (p.3). Tugrul (2012) found a positive correlation between the use of technology in student presentations and student perception on the quality of their delivery. We must now further address why this is the case and to what extent the 'show' is masking the content.

2.4 Perception and value of technology in teaching

Research on the relationship between technology and education has focused on whether or not utilising technology positively impacts teacher and student performance. Although the number of studies on this topic is increasing, more is still to be done. Whether or not technology has a positive impact on learning has not been fully established, and findings of various studies are incompatible in this regard.

Kulik (1994) conducted a large scale study on the impact of technology on students' achievement. This study took 10 years, and involved the review of hundreds of research studies on computer-based instruction using meta-analysis. According to Kulik (1994), meta-analysis means "the statistical analysis of a large collection of results from individual studies for the purpose of integrating the findings" (p.10). This analytical investigation determined four main points related to the positive impact of computer-based instruction, as demonstrated in Table 1 below.

Although Kulik (1994, p.13) acknowledges that "computers do not, however, have positive effects in every area in which they were studied", the study emphasises that utilising computer-based instruction improves programs in which they were integrated. These findings inform our research design as they speak directly to the role of technology as it relates to student perceptions of value. The findings of our research indicate a disconnect between perception and quality in this regard.

Table 1 Positive impact of computer-based instruction

Kulik's meta-analysis emerging points	Illustration
1) Students learn more in classes that utilise computer-based instruction	All the estimates were positive; the average effect of computer-based instruction was increasing examination scores from the 50th to the 64th percentile.
2) Students learn their lesson in less time with computer-based instruction.	In college context, the average reduction in instructional time was 34%, compared to 24% in adult education.
3) Students likes classes that use computers more.	Computer-based instruction raised attitude-towards-instruction scores by .28 standard deviations.
4) Students' attitude towards computers improves when they are aided by computers in their classes.	The average effect size on attitude towards computers was .34 standard deviations.

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In accordance with the Kulik's (1994), the findings of Sivin-Kachala and Bialo's (1994), who, in a large scale study, surveyed 219 research papers, came to emphasise the positive role of ICT implementation in classrooms. This impact was an-all-embracing one across 1) all subjects, where the studies reviewed found that the students' achievement improved in all subjects in classrooms rich with technology, 2) all levels from kindergarten to higher education, 3) all types of students whether regular students or learners with special needs, and 4) students' attitudes, where the review found an overall improvement toward learning in technology-rich environments. The review also adds that integrating technology in classrooms was found "to make learning more student-centered, to encourage co-operative learning, and to stimulate increased teacher/student interaction (p.7). Together, these findings accord with results that from a number of recent studies (Amiri 2012; Ghavifekr and Rosdy 2015; Montrieux et al. 2015; Summak 2010).

3 Methodology

This section of the paper delineates the background of the study, the instrumentation, and the unit of analysis, which is the degree of technology employed in the presentations.

3.1 Background

This study was conducted in a postgraduate university in the United Arab Emirates. The study involved a total of 30 postgraduate students: 15 from the Masters of Education (MEd) and another fifteen from the Doctorate of Education (EdD). Five MEd students were asked to prepare PowerPoint presentations on topics related to second language acquisition, and five EdD students were asked to prepare presentations related to curriculum and innovation; these ten participants will be referred to as student-presenters henceforth. All the 30 participants had Academic IELTS scores between 6.5 and 7.5, which indicate their proficiency in English. In order to evaluate

the presentations in the MEd and EdD classes, ten post-graduate student-presenters' peers (henceforth student-raters) were asked to provide their feedback for the five presentations. This was done using two assessment instruments: an attitudinal scale and a ranking scale, which will be discussed in detail in the following subsection. In addition, four external raters, two for each class, were asked to evaluate the ten presentations using the presentation rubric assessment tool. (Appendix A). The topics selected for the MEd presentations were: 1) Instructed second language learning; 2) Effects of form-focused instruction on second language acquisition; 3) Processing approaches; 4) Second language acquisition and related disciplines; and 5) The importance of timing in focus on form. The doctoral student-presenters were assigned the following topics: 1) Curriculum assessment guide for moral education; 2) The four critical areas for the development of the twenty-first Century skills; 3) Moral education within project based learning; 4) Curriculum integrating the twenty-first Century skills; and 5) Curriculum reform initiative.

The methodology of this paper utilises the mixed-methods approach since this design encapsulates the nature of the four research questions as questions one and two call for a quantitative analysis while the third and the fourth questions require a qualitative analysis. This mixed-methods design is underpinned by Pragmatism, a paradigm that allows for a combination of methods. This paradigm dwells upon the workability of research, where appropriate lines of action are used to answer the research questions (Kivunja and Kuyini 2017), and stresses that "fitness for purpose must be the guiding principle" in educational research (Cohen et al. 2018, p. 1). That said, the utilisation of both the qualitative and quantitative methodologies is necessary to benefit from the qualities of each in answering the four research questions.

3.2 Instrumentation

This study utilized three instruments, two by the 10 student-raters, and one by the four external raters. The first instrument used by the student-raters in both classes was an attitudinal scale. In this instrument, "Individuals are given polar opposites and asked to judge their impressions of a group of people" (Gass 2013, p. 46). The instrument used in this paper had 7 response options, ranging from *boring* to *interesting* (Table 2). Student-raters were asked to grade each presentation along this attitudinal scale. The closer the presentation was marked to 1 on the attitudinal scale, the more boring the student-rater thought the presentation was, and the closer the presentation was marked to 7, the more interesting the student-rater thought it was.

The second instrument the student-raters were asked to use was a ranking scale (Table 3). Using this instrument, each student-rater ranked the presentations by

Table 2 Instrument 1 – The attitudinal scale

	Boring						Interesting
	1	2	3	4	5	6	7
Put your mark (X) here →							

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Table 3 Instrument 2 – The ranking scale

Presentation 1	Presentation 2	Presentation 3	Presentation 4	Presentation 5

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selecting a number from 1 (lowest) to 5 (highest). Therefore, in the instrument shown in Table 3, the student-rater was simply required to write number 1 in the box below the presentation he/she believed should get the lowest grade, and number 5 in the box below the presentation that he/she would grade the highest. Number 4 had to be written in the box under the presentation that the student-rater would consider as the second best, 3 the third best and 2 the fourth.

The third instrument was a presentation rubric, adapted from Savory (2009), to evaluate oral presentations. This instrument was only given to the four external raters to mark the presentations. The rubric consisted of five areas: 1) organisation, 2) content, 3) visuals, 4) delivery, and 5) language and style. Each area was further categorized into sub-areas, which were each to be marked as A, B, C, or D based on the student's presentation. Some examples of the sub-areas include clarity of the outline, the introduction, and the conclusion within the area of organisation; the main points and the content presentation within the area of content; the effectiveness and number of visuals within the area of visuals; the student-presenter's presentation skills within the area of delivery; and language accuracy and the slide's loads of information within the area of language and style. A summary of instrumentation is provided in Table 4 below.

3.3 Unit of analysis

In relation to the research objective, the unit of analysis was the degree of technology employed in the presentations in the MEd and EdD classes. The presentations were coded based on the class (Masters or Doctorate) and the sequence in which the presentation was presented. Therefore, the first presentation delivered in the Masters of Education class was given the code MEd_P1, where *P* stands for *presentation*, and, in the same vein, the presentation that came third in sequence in the Doctorate of Education class was given the code EdD_P3.

The MEd student-presenters delivered five presentations related to second language acquisition, and integrated technology to various degrees. The first presentation (MEd_P1) was titled "Instructed second language learning", and the student-presenter

Table 4 Instrumentation tools

Instrument	Used by…	Used to evaluate…
Attitudinal scale	Student-raters	All MEd and EdD presentations
Ranking scale	Student-raters	
Presentation rubric	External raters	

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utilized a number of technologies to deliver the content. The student-presenter of MEd_P1 (25 slides) started the presentation with *Kahoot* (www.kahoot.it), a program that involves an interactive task whereby the student-presenter shows questions on the slide and the student-raters answer them by selecting choices through using their own mobile phones. MEd_P1 also integrated slide animation effects, images, shapes and a YouTube video.

The second presentation (MEd_P2) was entitled "Effects of form-focused instruction on second language acquisition". MEd_P2, which was composed of 16 slides employed only images and shapes. The third presentation (MEd_P3) was entitled "Processing Approaches" and composed of 18 slides. The student-presenter here utilized images, shapes and slide animation effects. The fourth presentation (MEd_P4) was entitled "Second language acquisition and related disciplines". The student-presenter of this topic utilized a considerable number of technological effects in a 40-slide presentation. This presentation was prepared using *prezi.com*, a website to create and share online presentations. MEd_P4 also integrated images, shapes, Goanimate videos (videos that showed clipart characters who present the information instead of the student-presenter), slide animation effects and YouTube clips. The fifth presentation (MEd_P5) was entitled "The importance of timing in focus on form", and consisted of 17 slides. This presentation employed only images and shapes.

As for the doctoral class presentations, technology integration was kept to the minimum in almost all of them. The only visual tools used on the slides, if any, were images and shapes, and in one instance, clipart. EdD_P1 was entitled "Curriculum assessment guide for Moral Education"; the 11 slide presentation employed images, colorful shapes and clipart. EdD_P2, entitled "Curriculum innovation in English language curricula within the 21st Century skills", consisted of 6 slides and used only images. EdD_P3 addressed "Moral Education within project-based learning". The 7 slide presentation, did not integrate technology of any sort. EdD_P4 addressed "21st Century-based curriculum", used a small number of images and shapes, and consisted of 9 slides. Finally, EdD_P5 was about a "Curriculum reform initiative"; the presentation used two clipart images 14 slides. Table 5 summarizes the information regarding the MEd and EdD presentations.

4 Data analysis

The present study espoused the mixed-methods approach to analyse the data gathered from the three instruments: the attitudinal scale; the ranking scale; and the rubric. The choice of a mixed-methods approach stems from the perception that this approach gives "a richer and more reliable understanding (broader and deeper) of a phenomenon than a single approach would yield" (Cohen et al. 2018, p. 32). Since the mixed-methods approach houses a number of designs, the design selected for this paper was the embedded design, where one method gains more priority than the other (Creswell 2012); the selected embedded design for the analysis done here was QUAN:qual, which means that primacy

Table 5 Summary information about the 10 presentations

Presentation	Title	Slides #	Involved technology
MEd_P1	Instructed second language learning	25	Kahoot (interactive game), images, shapes, slide animation effects, youtube video
MEd_P2	Effects of form-focused instruction on second language acquisition	16	Images, shapes
MEd_P3	Processing approaches	18	Images, shapes, slide animation effects
MEd_P4	Second language acquisition and related disciplines	40	Prezi.com, images, shapes, slide animation effects, GoAnimate videos, Youtube videos.
MEd_P5	The importance of timing in focus on form	17	Images, shapes.
EdD_P1	Curriculum assessment guide for Moral Education	11	Images, shapes, clipart
EdD_P2	Curriculum innovation in English language curricula within the twenty-first Century skills	6	Images
EdD_P3	Moral Education within project-based learning	7	0
EdD_P4	Twenty-First Century-based curriculum	9	Images, shapes
EdD_P5	Curriculum reform initiative	14	Images

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was given to the quantitative analysis of findings. This choice was rooted in the fact that the data from the attitudinal scale and the ranking scale was solely numerical, and therefore, called for a quantitative analysis. The data from these two instruments were presented employing descriptive and inferential statistics. The qualitative analysis was only developed from the comments added by the external raters on some rubrics, and these were used to add more in-depth description to the quantitative data.

The first step was to assign numerical data to the degree of technology employed in each presentation. Therefore, number 5 was given to MEd_P1 because the presentation integrated 5 different technologies, whereas number 0 was given to EdD_P4 because the presentation did not include any form of technology. The second step involved finding the correlation between the amount of technology used in the presentations and the student-raters' judgment of the presentations as being either interesting or boring. In order to determine this correlation, Pearson Correlation Coefficient (R) was calculated using SPSS 23.0 (IBM Corp 2015). Then, Pearson Correlation Coefficient was also calculated to find the correlation between the ranking scale results and the degree of technology employed in the presentations. In both calculations, the degree of technology represented the Y value, and the average scores from the two scales, the X value. Finally, the rubrics' results were reported in terms of grades from A to D for each presentation; this was twinned with a qualitative description of the external raters' comments. The findings of this mixed-methods analysis were reported with relevance to the research questions.

5 Findings and discussion

This section introduces the findings and the discussion of the results of the peer evaluation activity compared to the external raters' results. The first instrument used in this research was the attitudinal scale, where student-raters were asked to mark presentations against a scale from 1 to 7, with 1 indicating boring and 7 interesting. The results of this instrument for the MEd class and the EdD class are shown in Tables 6 and 7 respectively. The numerical value provided between brackets in the headings, indicates the degree of technology involved in each presentation.

In order to address the first research question: "What is the correlation between the degree of technology employed in the presentations and the student-raters' attitudinal evaluations of the presentations as boring or interesting?", the average score for each presentation in both classes was found and subsequently correlated, using the Pearson Correlation coefficient, with the numerical value that represents the degree of technology employed in each presentation. The following values were entered into SPSS 23.0 (IBM Corp 2015), where the Y value indicated the degree of technology and the X value the average score given to each presentation on the attitudinal scale: (5,6.1) (2,2.9) (3,4.5) (6,6.5) (2,3.4) (3,5.5) (1,2.7) (0,2.1) (2,5.0) (1,3.3). The result can be seen below (Table 8):

The value of R was found to be 0.910, which signified a strong positive, statistically significant correlation at the 0.01 level. In other words, the greater the amount of technology employed in the presentation, the higher the score the student-raters awarded to that presentation on the attitudinal scale. This indicates that the use of technology was directly linked to whether a presentation was considered boring or interesting.

The second question sought to find the correlation between the degree of technology and the student-raters' scores of the presentations on the ranking scales. Therefore, the Y value was the degree of technology, while the X value was set based on the average

Table 6 Attitudinal scale result for the Masters class

Student-rater	MEd_P1 (5)	MEd_P2 (2)	MEd_P3 (3)	MEd_P4 (6)	MEd_P5 (2)
1	7	3	5	7	4
2	6	3	5	7	3
3	5	1	4	7	2
4	5	2	5	6	5
5	7	4	4	6	4
6	6	4	5	7	3
7	7	2	5	7	3
8	6	4	4	6	4
9	5	3	3	5	3
10	7	3	5	7	3

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Table 7 Attitudinal scale results for the doctoral class

Student-rater	EdD_P1 (3)	EdD_P2 (1)	EdD_P3 (0)	EdD_P4 (2)	EdD_P5 (1)
1	6	2	2	5	3
2	5	4	3	5	3
3	6	3	2	6	5
4	3	4	4	5	2
5	5	1	1	3	5
6	6	2	2	6	3
7	7	4	1	6	3
8	6	2	1	3	3
9	5	2	3	6	4
10	6	3	2	5	2

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student-raters' scores on the second assessment tool. The following values were fed into SPSS: (5,4.3) (2,1.8) (3,2.7) (6,4.7) (2,1.5) (3,4.0) (1,1.7) (0,1.7) (2,3.8) (1,1.3). Table 9 shows the results of this analysis.

The value of R was found to be 0.835, which indicated a strong positive, statistically significant correlation at the 0.01 level. The greater the amount of technology employed in the presentation, the higher the score the student-raters awarded to that presentation on the ranking scale. This likewise indicates that the use of technology was directly linked to the ranking received, based on the student-raters' perspectives. Although the sample in this study is limited in size, the above results can firmly claim to be statistically significant because "statistical significance can be attained either by having a large coefficient together with a small sample, or having a small coefficient together with a large sample" (Cohen et al. 2018, p. 743). Obviously, the first case applies to the findings of the present analysis where a large coefficient was obtained from the relatively small sample. Therefore, it can be deduced from the above findings that the student-raters' judgments of the presentations using the two scales correlated

Table 8 Attitudinal Scale correlation between perception and use of technology

		Degree of Technology	Average Score of the Attitudinal Scale
Degree of Tech	Pearson Correlation	1	.910**
	Sig. (2-tailed)		.000
	N	10	10
Attitudinal Scale	Pearson Correlation	.910**	1
	Sig. (2-tailed)	.000	
	N	10	10

**. Correlation is significant at the 0.01 level (2-tailed)

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Table 9 Ranking Scale correlation between perception and use of technology

		Degree of Technology	Average Score of the Attitudinal Scale
Degree of Tech	Pearson Correlation	1	.835**
	Sig. (2-tailed)		.003
	N	10	10
Attitudinal Scale	Pearson Correlation	.835**	1
	Sig. (2-tailed)	.003	
	N	10	10

**. Correlation is significant at the 0.01 level (2-tailed)

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positively with the amount of technology used. By way of elaboration, the presentation that employed increased levels of technological effects, was perceived as more interesting and was given a higher score than the other presentations.

At this stage of the analysis, it is relevant to investigate the external raters' evaluations of the 10 presentations in both classes. The external raters used the presentation rubric to evaluate the presentations. As per the rubric, the presentations were to be graded as follows: A (excellent), B (very good) C (good) and D (needs improvement). The results of the external examiners accorded only minimally with the evaluations made by the student-raters on the ranking scale. The results of the third instrument for the MEd class and the EdD class are shown in Tables 10 and 11 respectively.

As can be seen from Table 10, the two external raters awarded A (excellent) to MEd_P2, which received an average of only 2.1 out of 5 as per the student-raters' ranking scale. MEd_P3, which got a low average of 2.7 by the student-raters achieved an A by one of the external raters and a B by the other, thus putting it in the second place. MEd_P4, which was considered the best by the student-raters with an average of 4.7, was evaluated as a B and a C by the first external rater and the second external rater respectively. MEd_P1 was better than MEd_P4, according to external rater 2, and was similar to MEd_P2 according to external rater 1, a result that was at odds with the rankings of the student-raters. The only overlap between the evaluations of the student-raters and the external raters was found regarding MEd_P5. Here the two groups agreed that it was the lowest in quality. These results clearly show that technology was a key factor in the student-raters' evaluations, a factor that led to making assumptions about the quality of the presentations. The disparity between the objective, rubric-based evaluations and the student-raters' evaluations revealed that the students had had assumptions about a positive impact of technology on presentations Appendix 1.

Table 10 MEd Presentation rubric results

Presentation	MEd_P1	MEd_P2	MEd_P3	MEd_P4	MEd_P5
External rater 1	B	A	B	B	C
External rater 2	B	A	A	C	D

Authors

Table 11 EdD Presentation rubric results

Presentation	EdD_P1	EdD_P2	EdD_P3	EdD_P4	EdD_P5
External rater 3	A	B	B	B	B
External rater 4	B	C	C	B	B

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As for the EdD presentations, less disconformity was noticed between the external raters' evaluations and the student-raters'. This is in no small part due to the minimal employment of technology in the five presentation. Compared to the MEd presentations, which included 18 technologies, the EdD presentations used only 7. Therefore, taken together, harmony in evaluation was salient in EdD_P1, which gained the highest scores in the evaluations of the three assessment instruments. Less conformity was seen in the evaluations of EdD_P3, which utilized zero technology. This presentation was given a low score by the external raters, this was echoed in the attitudinal scale, but came third in the ranking scale. Obviously, with the decreasing amount of technology, the ultimate rankings of the external raters and the student-raters became more, though not entirely, harmonious.

It is instructive at this level to address some of the comments made by the external raters on certain presentations, in order to clarify why the disparity in evaluation transpired. MEd_P4, which received the highest scores on the attitudinal scale (6.5 out of 7) and the ranking scale (4.7 out of 5), was awarded a B and a C, placing it fourth instead of first in the ranking. External rater 2 provided a number of comments explaining why MEd_P4 was awarded a C. One comment highlighted that the presentation took almost double the allotted time. This is clearly linked to the sixth point in the area of organization in the rubric. Another comment was "using GoAnimate was not a good idea; it just brought in some characters to talk on behalf of the student in three occasions, especially the one that presented various theories". Figure 1 below, is a snapshot form the slide that integrated animations to present theories.

The external rater's comment about this use of animation is directly related to the second and fourth points in the Presentation Content area in the rubric, which were "the presenter had a clear understanding of the material" and "content is analytically and

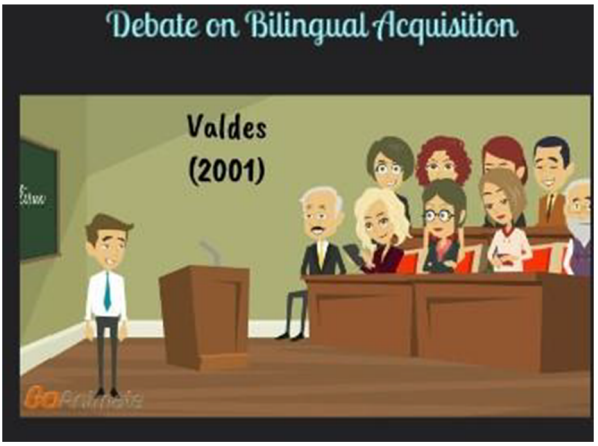

Fig. 1 A snapshot from slide 16 in MEd_P4. Source: Authors

critically presented" respectively. This point revealed that instead of being impressed by the use of this technology, which influenced the student-raters' judgment, the external rater considered it a shortcoming.

An additional salient point of disparity was found in the evaluations of MEd_P2, where the student-raters' scores on the attitudinal scale and the ranking scale placed this presentation as the least interesting and ranked fourth. Both external raters evaluated this presentation as the best with both awarding it an A. As shown previously, the student-raters' evaluations correlated strongly with the minimal use of technology in Med_P2. However, the external raters highlighted many strengths in the presentation based on the five areas of the rubric. Some of the good points they raised about the presentation included time management, the freeness from irrelevant information, the good range of references, the presenting skills and language accuracy.

From the doctoral presentations, EdD_P5 was evaluated differently by the external raters and the student-raters. The latter put the ranking of the presentation at 5, which meant that they thought that presentation should get the lowest grade, whereas the external raters gave EdD_P5 the second position, shared with EdD_P4. EdD_P5 was an example of a minimum-technology, minimum-scoring by the student raters and a minimum-technology, higher-scoring by the external raters. This was not the case in EdD_P1, which used the biggest number of effects in the doctoral presentations, where the external raters mentioned a number of strengths, including clear understanding of the content, presentation skills, accuracy and the all-embracing content.

6 Conclusion

Technology, represented in visual and audio effects, has a clear impact on various aspects of classroom practices. This paper focused on the correlation between the degree of technology employed in presentations and the postgraduate students' evaluations of these presentations. One main outcome of the study is that it revealed that students possessed technology-driven assumptions about the quality of presentations. The findings of the investigation revealed that the student-raters' evaluations of the 10 presentations in the Med class and the EdD class had a strong positive correlation to the degree of technology employed in these presentations. The correlation was mirrored in the student-raters' responses to the attitudinal scale and the ranking scale. Compared to the objective evaluations of the four external raters, the student-raters' evaluations were affected by the degree of technology employed in the presentations of their peers in a way that revealed established assumptions about the positive role of technology in presentations.

Taking the analysis one step further, it could be claimed that one bi-product of this study is that it revealed that students' assumptions about technological tools might lead to a negative impact on their own performance in certain tasks, such as assessed presentations. In the context of the researchers' higher education institution, it is not uncommon that students complain about their grades in assessed presentations, despite the rubric and the feedback making the assessment objective and focused. This study can serve as a solid piece of evidence that inadvertent assumptions about the positive role of technology might mislead students to believe that delivering an 'interesting', technology-laden presentation will guarantee a good grade.

On a cautious note, it is important that we do not get too carried away by the findings of this paper to believe that technology is a negative component in presentations. Such a

perception is no more than the analysis of the present study. This study sought to investigate the students' assumptions about the use of technology in presentations, not the effective use of technology in presentations. However, it is hoped that the paper and its findings may encourage further vigorous explorations vis-à-vis students' assumptions about, and perceptions of the role of technology in diverse classroom practices.

7 Limitations

The various methodological decisions made in this study were well-informed and fit the purpose of the study in a clear way. However, a word on the limitations is in order here. Firstly, this study involved 34 participants in total, 10 student-presenters, 20 student-raters and 4 external raters. This relatively small sample size affects the generalisability of the findings. A second limitation was that the rubric used for evaluation by the external raters was not negotiated with the students, which might provide one explanation why the participating students were partly driven by their interest in technology.

8 Implications and recommendations

The present study has a number of implications related to education at the post graduate level. One significant implication is that the instruments used in assessment need continuous revision, and the recommendation here is to negotiate these instruments with the students, thus, overcoming one of the limitations of the present study. Another education-related implication is that technology has to be taken seriously by instructors as an instrument that improves not only the quality of learning but also the quality of assessment. Although students' assumptions about the impact of using technology did not match well with the criteria of the rubric, their assumptions reveal that technology has to be integrated into instruction, definitely based on well-informed decisions and based on dialogue with the students.

Several themes emerged from the present study, that can be taken forward in future research. One theme involves the development of negotiated, generic presentation rubric based on a broad scale, cross-sectional study. Another theme might involve probing students' assumptions and instructors' perceptions on rubrics used to evaluate students' presentations. At the methodological level, it is suggested that similar studies be conducted in other higher education institutions to find out whether students in other contexts have technology-related assumptions with regard to presentations or not. Further research on the topic could also involve larger samples to increase the possibility of generalisations.

Availability of data and materials Data used in this article is held with the first author. It is not publically available given the privacy issues involved. Access can be requested by contacting the first author.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Appendix 1

Table 12 Presentation Rubric (Adapted from Savory 2009)

Name:	Topic:			
Organisation				
	A	B	C	D
There is a clear outline				
The introduction gives a clear idea about the topic				
Information is presented in logical, interesting sequence				
The conclusion did a good job of summarizing the content				
The presentation was free from irrelevant or filler information				
The presentation filled the time allotted				
Presentation Content				
The main points of the presentation could easily be followed				
The presenter had a clear understanding of the material				
Presentation content is comprehensive				
Content is analytically and critically presented				
There is a good range of references				
The presenter answered all questions with explanation and elaboration				
Presentation's Visuals				
The visuals were effective in enhancing the message				
The number of visual aids enhanced the presentation				
The visuals were displayed for an appropriate time				
Presentation Delivery				
The presenter spoke clearly				
The presenter made good use of hand and body gesture				
The presenter maintained eye contact with the audience				
Language and Style				
The slides were free from language inaccuracies				
The slides were not overloaded with information				
Grade:				
Comments:				

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