Academic Engagement and Technology: Revisiting the Technological, Pedagogical and Content Knowledge Framework (TPACK) in Higher Education (HE): The Academics' Perspectives

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Abstract

Research into the use of innovative information and communications technology (ICT) for academic purposes is growing quickly. Much of the current research explores the opportunities presented by ICT and social media as innovative tools for teaching and enhancing student learning (O'Brien & Glowatz, 2013; Duncan & Barczyk, 2013). This paper suggests that the role of the academic in navigating the use of ICT in their teaching in Higher Education (HE) has been overlooked in discussions. Koehler and Mishra (2009) propose the technological, pedagogic and content knowledge (TPACK) framework to explore the relationship of technology in teaching. O'Brien and Glowatz (2013) investigate the suitability of the TPACK framework in the context of academic engagement in order to investigate its relevance for academics teaching in HE. This paper suggests elements of the teaching dynamic are overlooked and evaluates the use of the TPACK framework in the exploration of technology in higher education by academics. Specifically, the authors address the key question 'How do academics currently make use of technology to teach at higher education?'.

Keywords: TPACK; eLearning; Irish Higher Education; academic engagement.

Introduction

There is an increase in the available academic literature on the use of innovative Information and Communication Technology (ICT), such as Facebook, Xing, Twitter or YouTube in Higher Education (HE). The social network Facebook has over 1.72 billion monthly active users (Statistics Brain, 2017) and was initially created for university students. Though the use of a technology for academic purposes can be viewed by some academics cautiously, other academics perceive that it may allow for the investigation and cooperation of answers and opportunities and solutions to problems during the course of the modules' online strategy (Duncan and Baryzck, 2013). This paper reviews how technology use is perceived by academics and reviews the TPACK framework because of their perceptions. The Technology, Pedagogy and Content Knowledge (TPACK) framework is an heuristic for exploring the elements required for effective teaching with technology. However, the data presented also demonstrate some limitations in the current TPACK framework.

Literature Review

The TPACK Framework

The TPACK framework was introduced as a framework for teachers and researchers to conceptualize the knowledge base to teach effectively with technology (Schulman, 1987). In the research to date, different terms have been used to refer to the instructor; some use the term lecturer and others refer to the teacher. Many of the articles from the United States tend to refer to the 'teacher' (Schulman, 1986; 1987). Incresingly educators are asked to consider how technological pedagogical content knowledge (TPACK) can be applied through design thinking processes (Koh, et al, 2015). Currently, there are few available surveys for understanding teachers' perceptions of implementing constructivist instruction with technology. This is termed as their constructivist-oriented technological pedagogical content knowledge. Therefore, teachers' perceived knowledge gaps in terms of constructivist-oriented technology integration are not well understood (Koh, et al, 2014a). For this paper, which looks at TPACK in the context of the Irish HE sector, the term 'lecturer' or 'educator' is more commonplace. The term 'lecturer' will be used ubiquitously through this paper to capture the terms of teacher, academic, educator and instructor.

Koehler and Mishra (2009) outline that traditional teaching technologies, e.g., a tool as simple as a pencil, tend to have characteristics such as specificity, stability, and transparency of function. By contrast, digital technologies tend to be usable in many different ways and are unstable and opaque, i.e., the mechanics of the technology are not visible to users. Koehler, et al (2017) have used the TPACK framework to review educational technology, including most recently digital teaching portfolios. Thus, because of the characteristics of digital technologies, they present challenges from a teaching perspective. For example, in the case of Facebook, some of the challenges might include the perception of Facebook as a social tool, the reluctance of institutions to use it for academic purposes or the digital privacy issues of using a social tool for academic purposes.

The TPACK framework outlines a complex interaction between three areas of knowledge: content, pedagogy and technology which produces the category of flexible knowledge required to integrate technology into teaching. Only the interplay between these three domains can generate the type of flexible knowledge which is needed to successfully incorporate technology into teaching. Contextual factors are acknowledged to influence the practice of teachers.

TPACK does acknowledge this dynamic. However, the influence of the contextual variables on on a teacher's conceptions of TPACK remains unexplored and this gap is acknowledged by others explored the heuristic (Koh, et al, 2014b). Case studies and explorations of TPACK tend to characterise its seven constructs. The manner in which lecturers' TPACK conceptions are affected by by the contextual factors, suh as their beliefs about ICT or access to ICT are generally very briefly referred to and rarely analysed by studies (Koh et al., 2014b).

Koehler and Mishra (2009) acknowledge that teaching is a complex phenomenon and often a lecturer has to practice their craft in a very dynamic environment which requires them to constantly develop their own understanding. A newer technology may be obscure and unstable itself. It may present new challenges to those who attempt to use technology more in their teaching. An example in the context of this study could be the use of the social networking site (SNS) Facebook and the areas of ethics and privacy, which it requires. In addition to the complexities of the technology, context and social factors may also affect the use of technology, e.g., the educational institutions themselves may not be supportive of an individual's efforts to use technology. Thus, the task of integrating technology into teaching can be both complex and difficult. Mishra and Koehler (2009) highlight while that there is no one best way to incorporate the use of technology into the learning environment; three central components are central to its success; content, pedagogy and technology. They suggest that the interaction between these three areas account for the diversity experienced in the quality and scope of technology integrated into teaching. Building on Shulman's work (1986; 1987) the TPACK framework may capture how a lecturer's knowledge of educational technology and how the domains of content and pedagogy knowledge interact with technology knowledge. As important as these three components are, so too, are the relationships between these three bodies of knowledge which are PCK (pedagogical content knowledge), TCK (technological content knowledge) and TPK (technology pedagogical knowledge) building the core components of the overall TPACK framework (Figure 1).
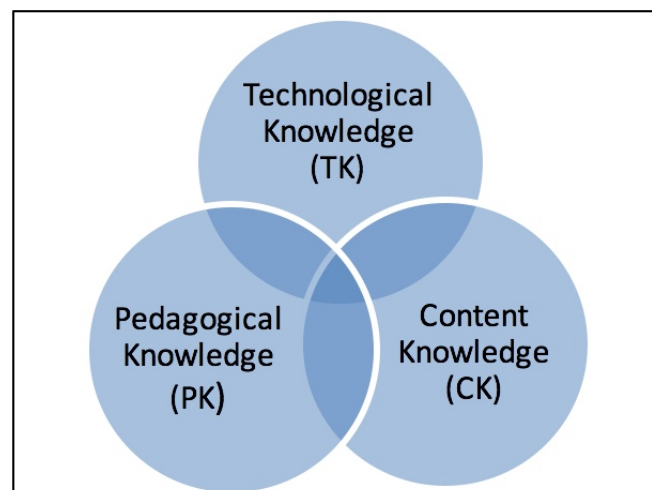

Figure 1: The TPACK Framework and its knowledge components.

TPACK Framework Components

There are seven constituents components of the TPACK Framework and each will be briefly alluded to now. Content knowledge (CK) relates to the lecturer knowledge regarding the material to be taught or learned. A lecturer needs to have in-depth content knowledge of the

concepts, theories, evidence, practices and approaches, which might develop a student's content knowledge of the material. Pedagogical Knowledge (PK) provides insight into the lecturer's knowledge about the methods or practices of teaching and learning, including educational values, rationales and intents. It also includes awareness of how students learn, are assessed, how content knowledge is best communicated. According to Koehler and Mishra (2009) Technology Knowledge (TK) is the most dynamic element of the framework as the definition of a particular technological tool can be outdated by the time it is researched or discussed. TK is never an 'end state' (Koehler & Mishra, 2009, p. 74) regarding how to master a technology but instead it is all the time advancing as the individual interacts with technology.

Pedagogical Content Knowledge (PCK) refers to lecturer's unique knowledge of the subject matter, which they interpret and present to students using their insight into the student's needs, the curriculum, assessment required. It requires the ability to demonstrate the relationships between the different discipline ideas, pedagogic strategies, students'prior knowledge. Technological Content Knowledge (TCK) demonstrates how technology and content knowledge have a close relationship as technology changes are often associated with new understandings of the world. Koehler and Mishra (2009) give the example of how a digital computer advanced understanding of mathematics and physics and led to a fundamental change in the nature of this field.

An appreciation of the impact of technology on practices and knowledge of a particular subject area is fundamental to advancing appropriate technological tools for educational reasons. Lecturers require some appreciation of the specific technological tools which are available and best suited to address the subject-matter learning in their field and how this technology might change the content of their discipline or vice versa. Another example of relevance to this study might be the use of Facebook to demonstrate how social networking might operate in the business environment for marketing purposes. Technological Pedagogical Knowledge demonstrates how an understanding of learning and teaching can alter when a specific technology is utilized in a certain fashion, including knowledge of how the quality of the teaching object or environment relates to the module and the ability to develop suit pedagogical strategies and designs to develop student learning.

Finally, Technology, Pedagogy and Content Knowledge (TPACK) is an emergent form of knowledge, which pervades beyond all three key constituents (Koehler & Mishra, 2009). TPAC knowledge emerges from the dynamic between pedagogy, technology and content knowledge and yet, it is an unique type of knowledge, which is the basis of effective teaching with technology. Such teaching demands an appreciation of the representation of concepts using technology. It requires pedagogic tools which utilise technology to teach content; and knowledge which present concepts to students as tangible. Teaching with technology requires the knowledge of how technologies develops new ways of understanding. Koehler and Mishra (2009) acknowledge that there is no single correct amalgamation of how these elements should be utilised. The lecturer is best placed to respond to the demands of the three elements in accordance with the learning environment and students. Thus, they require the skills to adapt and respond to the fields of technology, content and pedagogy (T, C and P) and the areas of interplay between them (PCK, TPK, TCK and TPACK).

Implications of TPACK

The TPACK framework is one which lends itself to the investigation of the knowledge basis of a lecturer in utilising a SNS for teaching purposes. It acknowledges a number of the key

variables and allows for the flexible combination of them depending on the dynamic of the learning environment. An inherent strength of the framework is its ability to review technology not simply as an add-on but to focus on the connections between the three domains of content, technology and pedagogy in the learning environment (2009). While the framework helps conceptually with the knowledge base required by lecturers, it does appear to misrepresent the human interaction required in this knowledge transfer. There might be three elements to this misrepresentation; first the lecturer's accumulated knowledge of their practice of teaching which they bring to the learning experience: second the centrality of the learner and understanding in the experience of being taught with technology: third the lecturer's proficiency with the technology is central to the use of using technology to enhance the quality of the education experience. Each of these elements is briefly discussed from a theoretical perspective before the results of this study are reviewed.

First, in a review of the TPACK framework, Voogt, Fisser, Pareja Roblin, Tondeur, and van Braak (2013) completed a systematic literature review of 55 peer-reviewed journal articles and one book chapter which were published between 2005 and 2011 to explore the theoretical and practical uses of TPACK. They note the value of the TPACK framework is that technology is acknowledged to support students in learning the conceptual and procedural aspects of a particular subject domain. Voogt et al. (2013) suggests that it is important to understand how technological reasoning affects the lecturer's decisions when using technology. Equally, they suggest that lecturers need to be shown what benefit technology is for their subject for improving the teaching and learning environment.

Second, the current framework does not sufficiently account for the lecturer knowledge of student's cultural backgrounds, their knowledge of student profiles and demographics of different student cohorts, insight into the students' familiarity with the technology to be utilised, or the cultural variances, which may exist within a cohort in utilising technology in the teaching environment. Such a dimension extends beyond the idea of pedagogic knowledge or its related areas of pedagogic content knowledge or pedagogic technological knowledge. This critique, perhaps, is indicative of a deeper concern regarding the centrality of the student to the learning process as outlined in the current TPACK framework. The model currently focuses on knowledge and the transfer of knowledge, rather than the learning experience of the student. The research below demonstrates the importance of understanding student profiles, as well as the lecturer's own craft knowledge and technological knowledge, to successfully use technology in the learning experience.

This need for craft knowledge, technological knowledge and technological proficiency raises the third issue with the current TPACK framework. The authors wish to explore the importance of a lecturer's proficiency with technological knowledge as perceived by the students. Some suggest students' expectations of their lecturers and the use of technology in their teaching have changed. Central to this improved and more engaging experience is an expectation for lecturers to have a high level of technological knowledge.

Lecturers and Technology Use

There has been considerable growth in the adoption of ICT within HE. Using ICT can be costly in terms of the financial investment made by institutions for infrastructure, equipment and technical support staff, and in relation to the personal investment made by staff and students in using the technology for teaching and learning. In western universities, institutional learning environments are almost ubiquitous and their use by teachers and students can no longer be

considered a novelty or the domain of enthusiasts alone (Kirkwood & Price, 2013). Indeed some have reported the use of some technology can be a distraction for students (Tossell, et al, 2014; Gikas and Grant, 2013). Higher education institutions are aware of the possible digital disconnect between enthusiastic rhetoric and the actual reality of educational technology in a higher education institution.

Conole (2014) acknowledges that in recent decades educational technology was promoted to have the power to transform higher education. Some suggest the evidence of this transformation is limited (Kirkwood and Price, 2013). While there is much research into how lecturers might use the technology, their conceptions of approaches is rather absent. Englund, Olofsson, and Price (2016) illustrate a number of interesting findings in their longitudinal study which demonstrated that novice lecturers changed their conceptions of and approaches to lecturing with technology which related to more student–centered approaches. However, their research found that more established colleagues did not change their approach to teaching with technology. This paper hopes to review their approaches to teaching and learning, as per Kember's (1997) definition; those strategies which lecturers adopt for their teaching practice. The ICT tools used at University College Dublin (UCD) College of Business and their perception of them by academic staff is now explored.

Methodology

As is usual in the business and management disciplines, a survey methodology was selected for this research project. It allowed potentially large-scale data to be collected (Byrman and Bell, 2015). The survey was distributed online to allow for data collection in Ireland, Singapore, Hong Kong and Sri Lanka, including two campuses in Dublin. These are the five campuses of the College of Business. Using the online survey instrument Qualtrics (www.qualtrics.com), the authors designed an online questionnaire as the primary data collection tool for this study. One survey was distributed to academic staff members associated with the UCD College of Business in April 2015. In each case, academics were sent an online survey and had a two-week period to respond anonymously. UCD Code of Research Ethics was adhered to in the execution of the data collection and analysis. 58 lecturers responded out of a sample of 300 resulting in a response rate of just above 19%. Approximately 50 of the 300 adjunct staff are from Hong Kong, Singapore and Sri Lanka. Eight (8) lecturers were from the overseas campuses. To allow for some anonymity, the researchers did not discern between the five campuses but only provided two options: Dublin and overseas. While the sample is small and the results are inconclusive, it does provide important insights into the perception and usage of technology by academics for teaching purposes.

The survey comprised eighteen (18) questions, which were a mix of open-ended, closed-ended and a rating scale (modified Likert scale). A copy of the survey is included in Appendix A. The statistical data was analysed using the tools of the Qualtrics survey software allowing the data to be analysed and cross tabulated where appropriate. Descriptive statistics were used to summarise the survey's quantitative data. Content analysis, using themes arising from the literature, were used for coding the open-ended questions. Seven key themes were identified. They were student expectations, student experience, and impact of technology, perception of knowledge base, student engagement and challenges. Phase two of the project has commenced to allow for some qualitative, semi-structured interviews with participants. The data based on only the survey instrument is admittedly a limitation of the study.

Research Site

UCD College of Business – being the top business school in Ireland – was selected as the research site. Its faculty has the most significant publication record in the country. It is the only Irish business school with triple accreditation – i.e. EQUIS, AMBA and AACSB and is the only Irish business school ranked in the various Financial Times rankings. It spans five campuses in Europe (UCD Main Campus Belfield Dublin and the Michael Smurfit Graduate School of Business Blackrock, Dublin) and Asia (Singapore, Hong Kong and Sri Lanka). It has approximately 100 full-time faculty dedicated to the business discipline, as well as approximately 300 part-time, adjunct faculty. There is a dedicated Business eLearning team which provides four skilled staff members to support the use of technology in teaching and learning (T&L) related initiatives at the College.

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Research Results

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The findings from the survey analysis are presented here. In order to gain an insight into the profile of the respondents to the survey, participants were asked how long they had been teaching or supporting teaching in the HE sector (Figure 2).
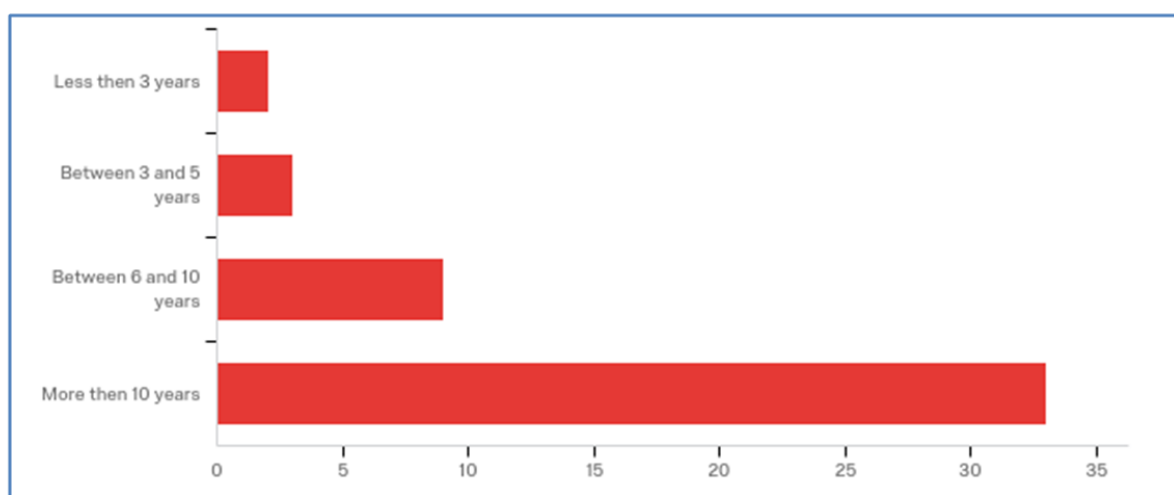
Figure 2: Duration of service of respondents at the time of study.

The profile of candidates was also reviewed in terms of the teaching position. There was representation across all of the five campuses at the College of Business with most respondents being that of College Lecturer (24 respondents), as per Figure 3.
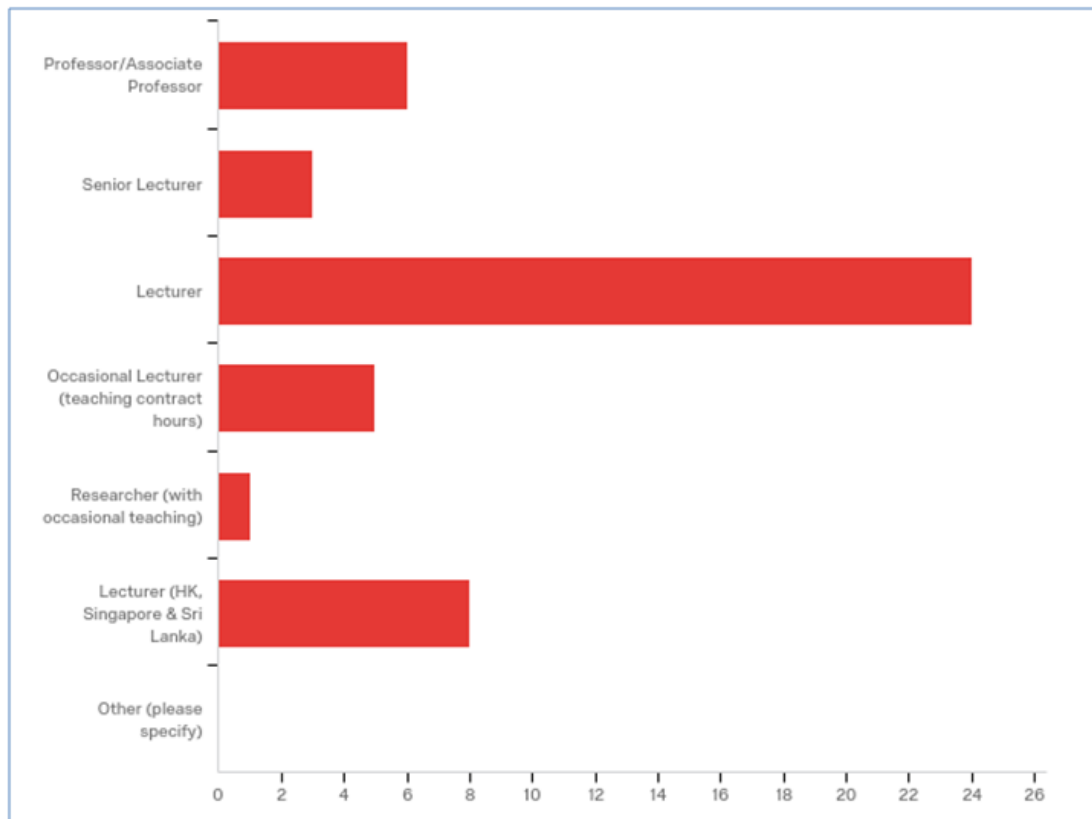
Figure 3: Position in the School of Business.

Staff were asked to respond to the extent of technology usage for teaching related purposes, as reported in Figure 4 below. Email and the Internet were reported by many as daily uses. While the Google suite and Blackboard (UCD's selected virtual learning environment rated highly also, there was a relative narrow number of other applications drawn upon from a listing which included Facebook, Twitter, polling software just to name a few). Interestingly, the 'Moodle' virtual learning environment appeared to have a high level of engagement given it is not the official university designated and supported supported Virtual Learning Environment.
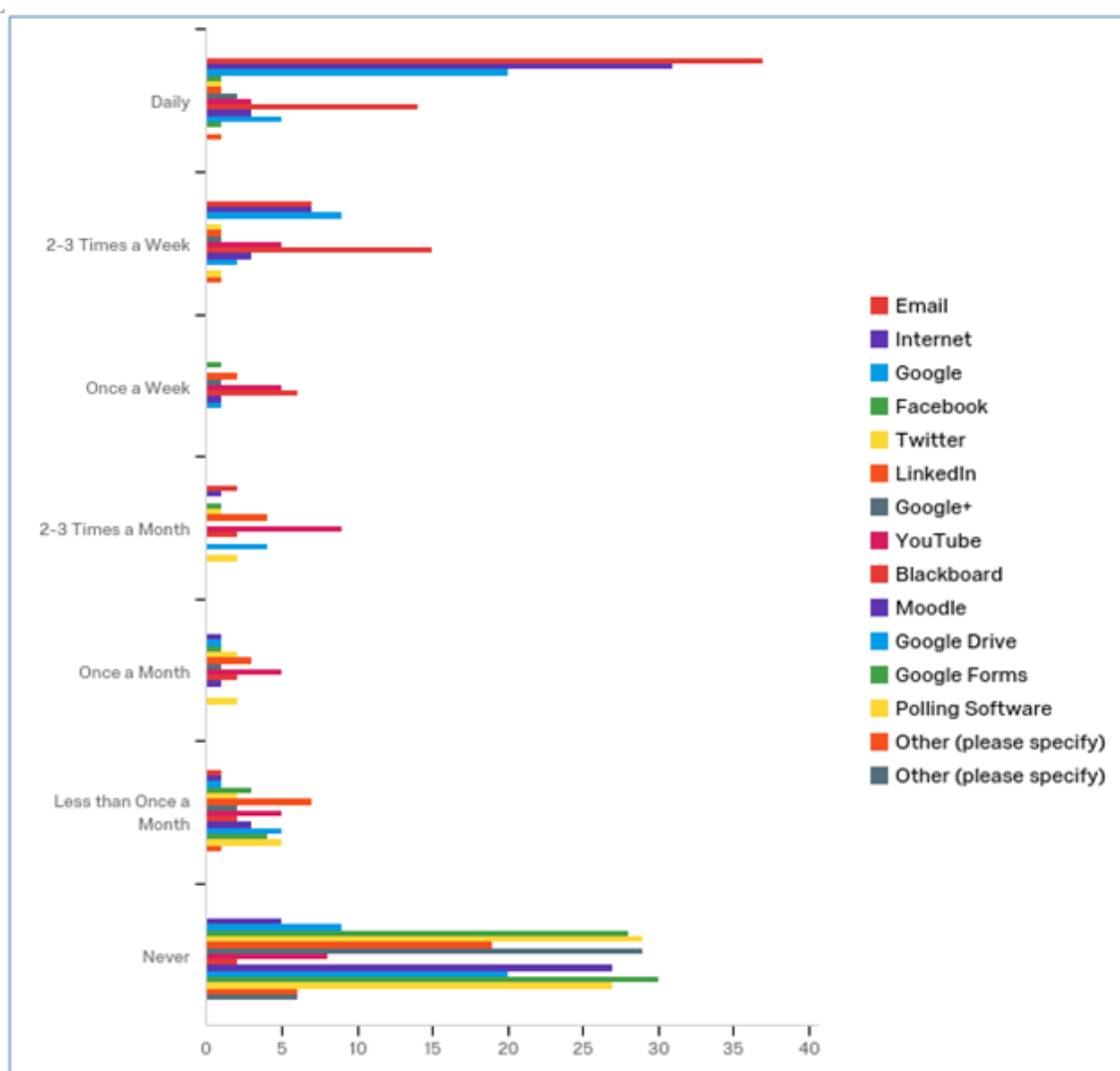
Figure 4: Technology usage for student engagement and teaching purposes.

Figure 5 reviews the reasons why the particular technology was selected by teaching staff. The ability of the lecturer to manage their student engagements appeared to be the most common driving influence 69.57% of lecturing staff were also being led by the intention of improved student interaction and the opportunity to assist students with understanding the module material. The opportunity to expose students to new technology and skills was not something which was highly rated. Equally, lecturers did not appear to respond to students' expectations to make use of social media in their teaching.
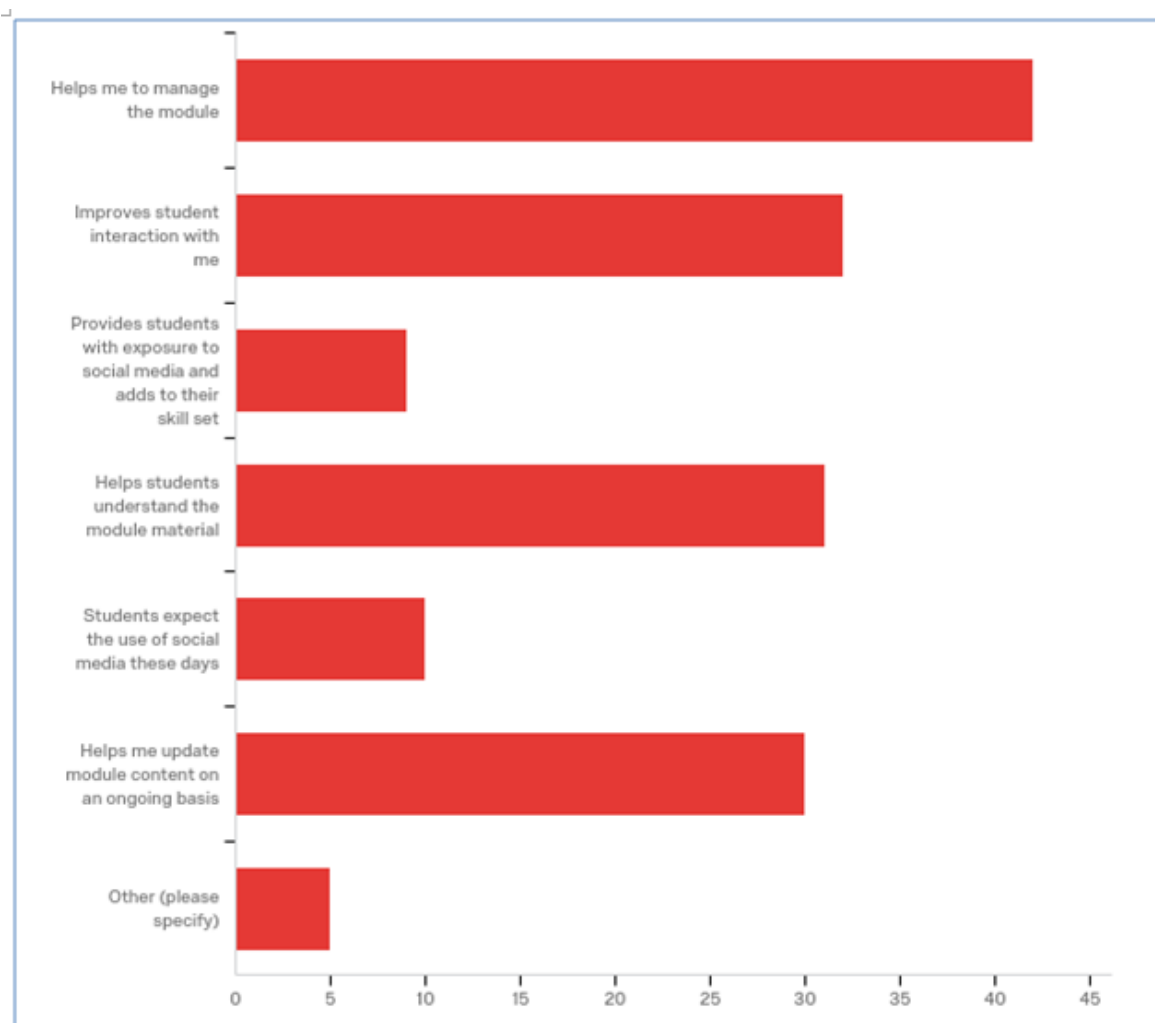
Figure 5: Reasons for selecting particular technologies for teaching purposes (multiple answers possible).

Respondents were asked to outline the features of the technology they using. The responses suggest that engagements are largely around document sharing, rather than more active, higher order learning opportunities to utilise technology. Figure 6 demonstrates some less frequent engagement with wikis, online quizzes and collaboration.
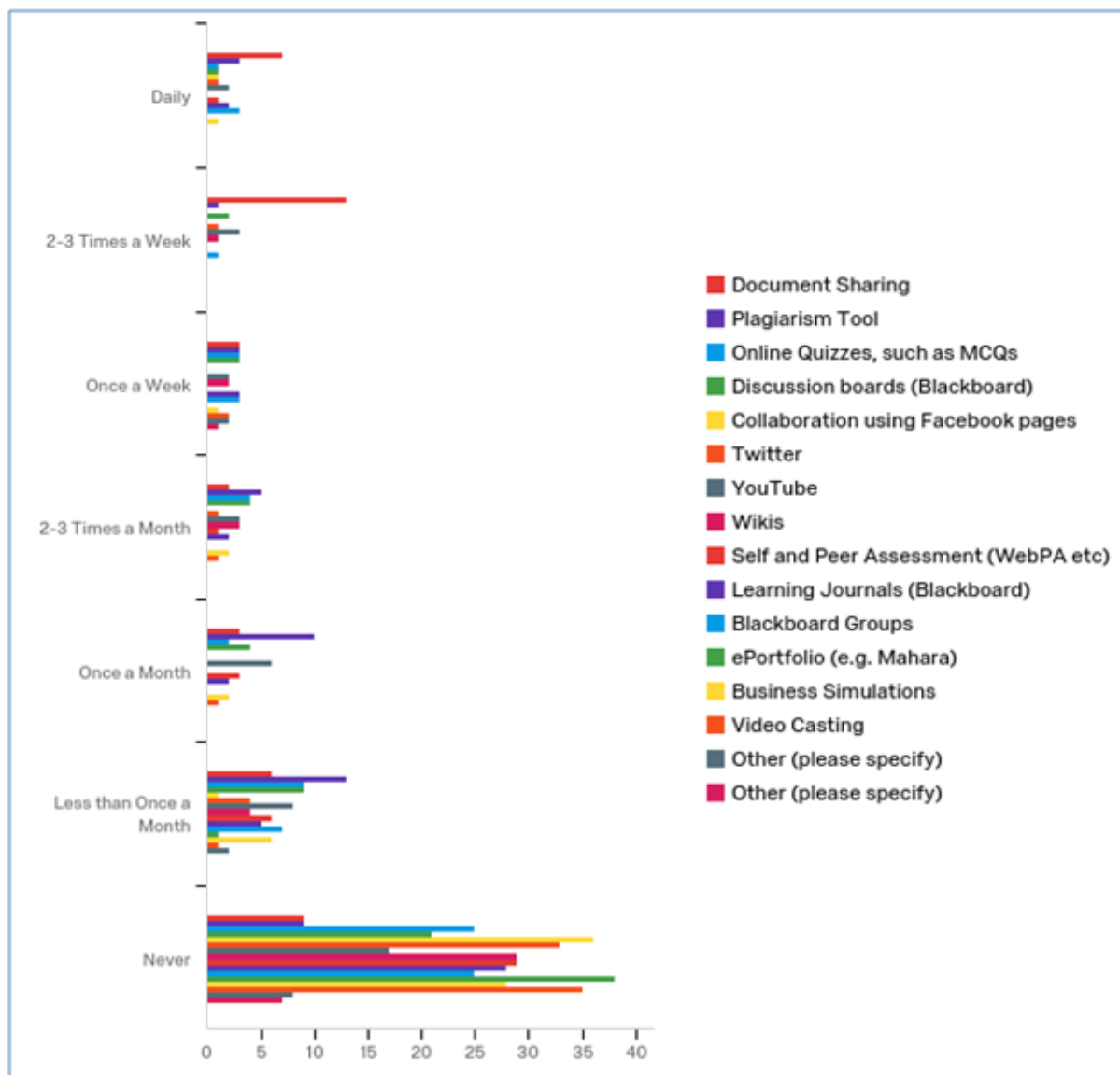
Figure 6: eLearning currently utilized?

Figure 7 provides an insight into how lecturers perceive their own use of technology. In particular, this table indicates that lecturers in this study do not firmly believe in the use of technology to enhance the learning experience. 29% were neutral in the opportunity for students to learn more from the content because of blended learning. Only 15% demonstrate that they perceive technology as something, which reduces their workload.
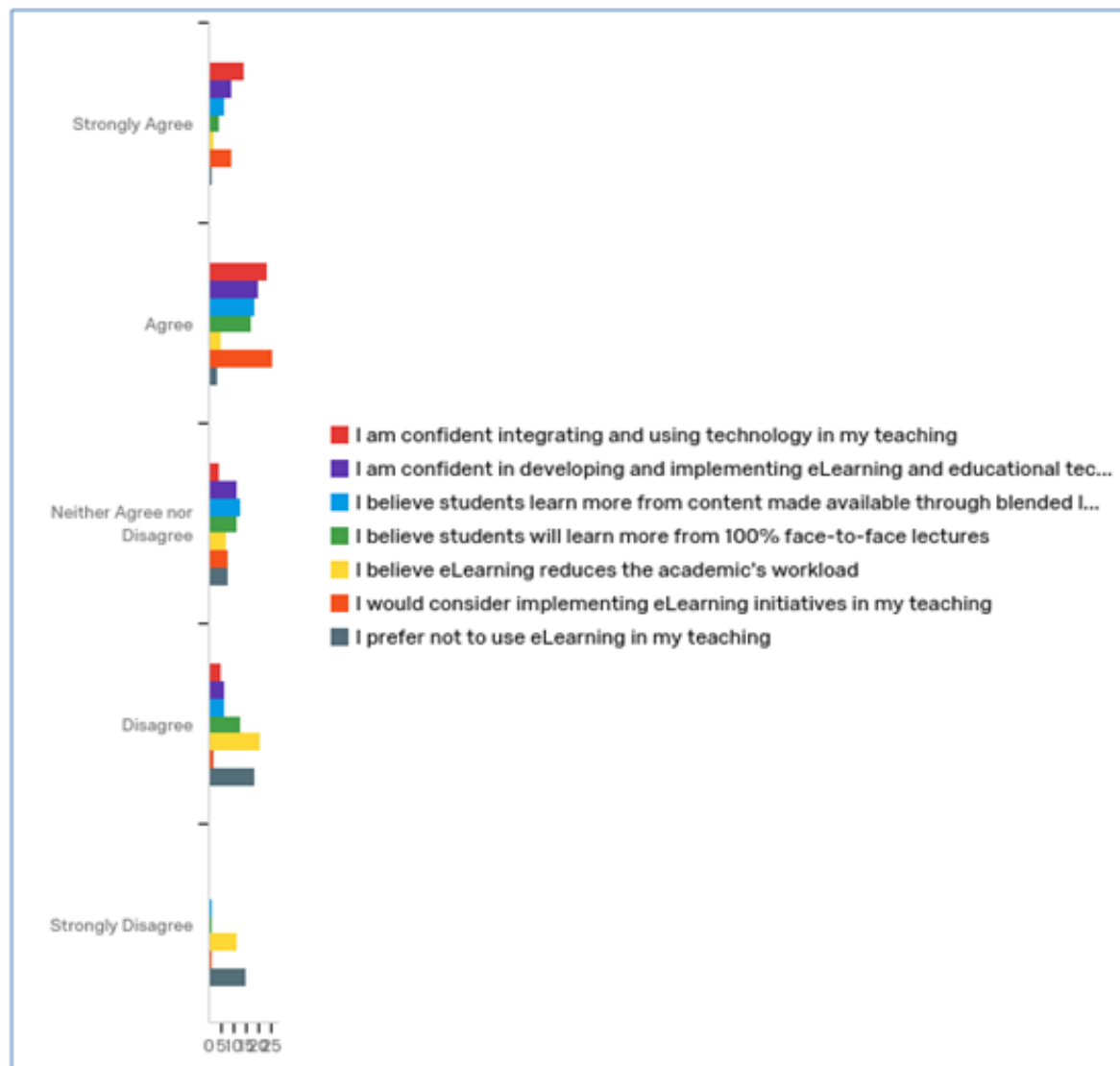
Figure 7: Indicate your opinion on the following statements regarding eLearning and the use of educational technologies in the higher education sector.

The next section of the questionnaire investigates the technology confidence level among lecturers and perceived EdTech implementation challenges and opportunities. The results shown in Table 1 suggest that the surveyed lecturers are indeed confident in integrating and using technology as part of their curriculum design and teaching; however, Figure 8 suggests that lack of time, resources, suitable infrastructure and suitable training and support are the main reasons for not implementing innovative EdTech.

Table 1: Academics' confidence level in integrating EdTech.

#	Question	Strongly Agree ▲	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Total Responses
1	I am confident integrating and using technology in my teaching	14	24	4	5	0	47
2	I am confident in developing and implementing eLearning and educational technologies in my teaching	9	20	11	6	0	46
6	I would consider implementing eLearning initiatives in my teaching	9	26	8	2	1	46
3	I believe students learn more from content made available through blended learning (combination of face-to-face and eLearning)	6	19	13	6	1	45
4	I believe students will learn more from 100% face-to-face lectures	4	17	11	13	1	46
5	I believe eLearning reduces the academic's workload	2	5	7	21	11	46
7	I prefer not to use eLearning in my teaching	1	3	8	19	15	46
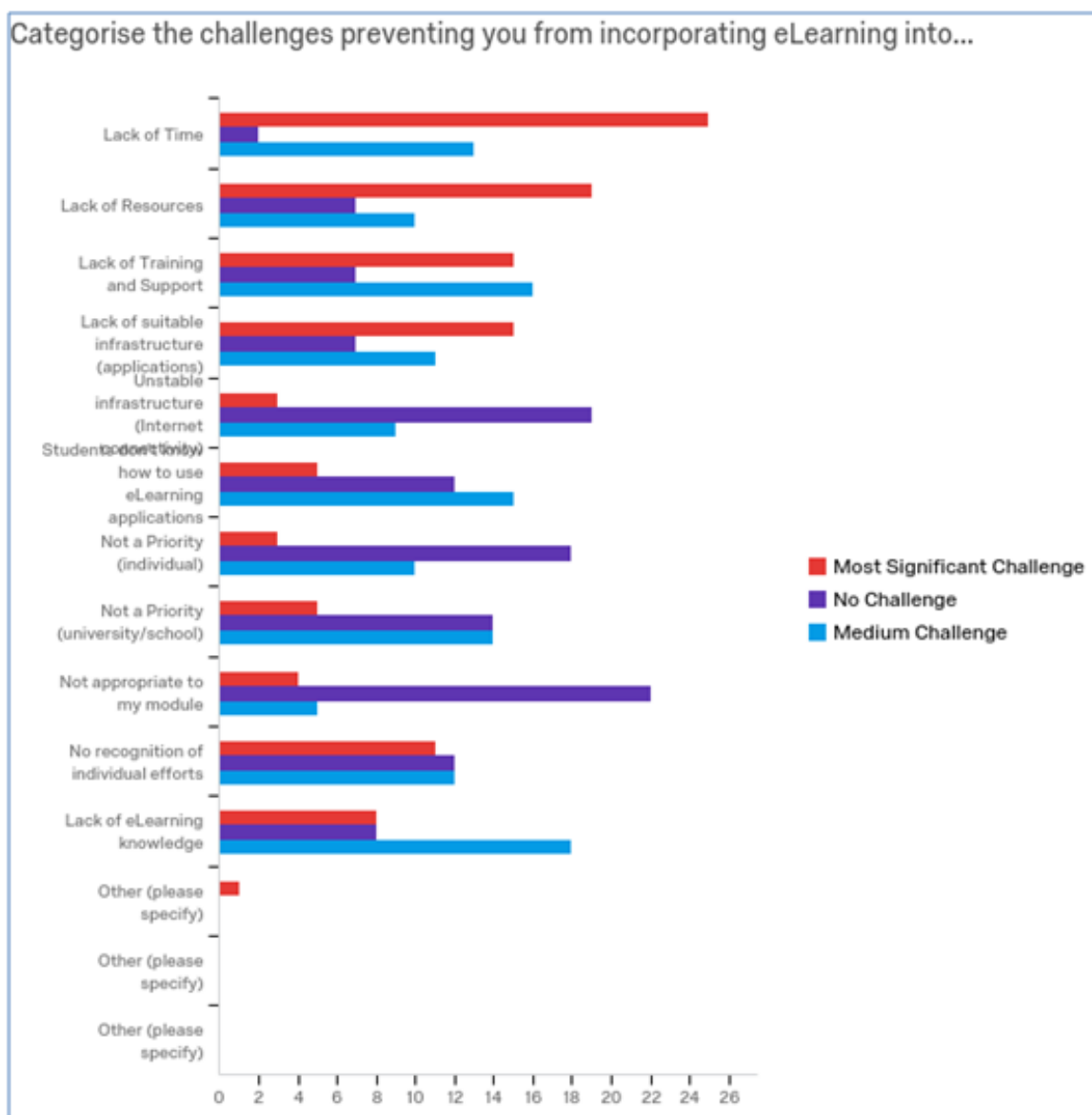
Figure 8: Challenges preventing lecturers from incorporating eLearning into curriculum design.

On the other hand, survey respondents indicated that incorporating EdTech in their teaching would potentially result in enhanced student learning, student engagement and more efficient module content delivery (Table 2).

Table 2: EdTech opportunities.

#	Answer	answer0 ▲	answer1	answer2
2	Enhanced student learning	25	3	11
3	More efficient delivery of module content	19	5	16
4	Enhances student engagement	19	6	14
1	Better lecturer/student collaboration	10	5	20

Finally, academics were asked to indicate their interest in EdTech related areas as outlined in Table 3 below.

Table 3: EdTech interests.

#	Question	Great interest ▲	Some interest	Little or no interest	Total Responses
2	Designing blended learning	22	20	5	47
1	Learning how to implement eLearning strategies	18	25	3	46
7	Customising Blackboard features	17	18	11	46
3	Designing mobile learning	10	15	20	45
6	Designing social learning (YouTube)	7	20	19	46
4	Designing social learning (Facebook)	4	9	33	46
5	Designing social learning (Twitter)	3	11	31	45

The following quote provided an interesting insight into one participant's understanding of role of the lecturer. There is a sense that while they are experts in their discipline, technology creates an additional concern and a set of expertise, which is additional to their role:

> Currently available eLearning tools are of little interest to students. We either have to use the media of 'their' world (FB and the likes) or we may not bother at all. I don't want to use FB out of principles and that's where I hit a wall. Also, online content should be professionally developed. In top schools blogs etc. are written by PR experts. Why should this be on the lecturers to develop such content? Why can't we have a team of web experts who translate my teaching materials into the new media and technologies? I really can't be an expert in everything.

Some of the key findings presented by the survey outlined above include the apparently limited use of technology tools in teaching, the scope of these tools appears to be relatively narrow and there is some evidence of a rather benign belief about the possibilities of technology to improve the student experience of learning.

Discussion

The TPACK framework does indeed provide invaluable insights into the many complexities of the knowledge bases lecturers utilise to successfully design and deliver a module to improve student engagement and maximise student-learning experience in the HE sector. The data presented in the research suggests that academic staff at UCD's College of Business embrace a relatively small number of technological tools for teaching purposes. The utilization of traditional educational technology (EdTech) tools such as email and the college's virtual learning environment, namely Blackboard, were most commonly reported. More innovative tools such as social media or polling software, however, were often overlooked (Table 3 above). Only 10% of staff completing the survey believed that students' have expectations regarding usage of social media tools today. As discussed earlier, this perception is at odds with the research, which demonstrates that the current generation think and learn differently compared to previous generates (Lai & Hong, 2015).

Technological knowledge is a key facet of the TPACK framework and is acknowledged as central to the effective use of technology in the classroom (Koehler & Mishra (2009). The literature acknowledges that technological knowledge is premised on how an individual continues to respond and evolve with the technological tools available in the learning experience. Respondents suggested that there were mixed levels of self-reported proficiency regarding electronic learning (eLearning) tools (Table 6). The mixed proficiency reported is compounded with the suggestion of perceived lack of training and support. It is acknowledged that this is only the experience of those surveyed and indeed the level of technological knowledge may be higher than reported. The concern based on the findings here is that the level of technological knowledge is maintained and sufficiently high to meet the needs for quality provision.

To summarise, the authors identified several key observations:

1) The survey suggests that lecturers embrace a relatively narrow range of technology tools for teaching purposes.
2) Most lecturers responding does not appear to be concerned with student expectations to make more use of technology in their teaching.
3) Survey results suggest limited interest among lecturers to integrate emerging technologies and EdTech initiatives, such as mobile or social learning into their teaching. However, this raises concern as both mobile and social technologies are already playing substantial part in how students today and cohorts of tomorrow study and learn.
4) Technological knowledge is apparently limited based on the participants' respective responses. The response rate is low, so admittedly there might be greater levels of engagement with technology, which are not captured by this survey.
5) TPACK suggests teaching today requires technological knowledge for teaching to be effective today. The lack of technology engagement is then possibly inhibiting opportunities for teaching.
6) This raises a concern that if technological knowledge is not sufficiently high that this may become a bigger issue as the digital divide increases with young incoming students with technology skills very different to that of staff.

Conclusion and Further Research

The research reorted here set out to investigate 'Does the TPACK framework provide an insight into the knowledge base required to effectively deliver a module using technology?' The TPACK framework provides a useful heuristic to explore the classroom environment. Koehler and Mishra's (2009) model outlines some of the technological considerations which affect both students and academic staff. Their model represents three equally valued spheres of Technological Knowledge, Pedagogical Knowledge and Content Knowledge. However, it may overstate the role of technology in the learning environment in higher education. The learning environment is a dynamic and complex phenomenon. The suggestion of this paper is that perhaps the three elements are not as equal in their contribution to the classroom environment, as per the model offered by Mishra and Koehler. Technological Knowledge seems underexploited in this case, but students do still report a generally favorable experience on College evaluations. It is not clear that Technology Knowledge necessarily impacts the quality of teaching however. There is still the scope to demonstrate that craft knowledge of a discipline is not reliant on technology knowledge. However, with the digital divide outlined above, it does appear that perhaps an opportunity is being missed by not utilising eLearning technology further to enhance the student's overall learning experience. The concept of craft knowledge comes to the fore again and warrants further investigation. It is worth investigating that if technological knowledge is not fully utilised, but a lecturer demonstrates superior content knowledge do students still perceive their learning is attained? Is it the craft knowledge, which ultimately counts for students? Does craft knowledge possibly compensate for a lower level of Technological Knowledge? This remains to be seen, as does the possibility that there is a threshold of technology engagement expected by students in higher education today.

For educators, the use of the TPACK framework can help the individual their understanding and awareness of the contextual influences of the TPACK framework. As Koh et al. (2014b) suggests an awareness of the TPACK framework creates an opportunity to convert this awarness into teaching opportunities as they enact the framework. Educators need to be able to draw the conclusion between the discourses which focused on the Culutral/Instituitional concerns which may emanate around logistics and then those which are derived from pedagogy. This paper suggests that educators need to be empowered to engage in these discourses about their design considerations.

In summary, while the use of a technology, for academic purposes can be viewed by some lecturers cautiously, other lecturers perceive that it may allow for the investigation and cooperation of answers, opportunities and solutions to problems during the course of the modules online (Duncan & Baryzck, 2013). Evidence based on the survey findings suggest some staff are still cautious regarding the use and potential use of technology. It raises questions for the opportunity for optimising the craft knowledge of lecturers if they are cautious in using technology to teach the Millennial Generation in the years ahead.

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Appendix A (Survey Design and Questions)

1 Introduction
This research project is being conducted by Orna O'Brien (Centre for Distance Learning, UCD School of Business, orna.obrien@ucd.ie) and Matt Glowatz (MIS, UCD School of Business, matt.glowatz@ucd.ie).

What is this research about?
The primary aim of this study is to examine the School of Business' academic staff's understanding, perception and opinions on aspects of the use of educational technologies for electronic learning (eLearning) at the School. The objectives of this study are as follows:
To explore what academic staff define as eLearning
To examine how academic staff use eLearning to enhance their teaching
To identify examples of good practice in terms of implementing eLearning

Why are we conducting this research?
The higher education sector is faced with students that were brought up in a world of digital and social media with the role of the university going from one of a broadcaster to a collaborative facilitator. Academics are at the forefront of electronic learning as they are the experts in providing content to the learning (student). Consequently, the academics' perceptions, attitudes and behaviours related to eLearning may be the single greatest determinant of success (Wickersham & Emelhany, 2010). To date, the majority of research around technology and learning has focused on the students' experience, as opposed to that of the academics (Mishra & Koehler, 2009).

In conclusion, this project is building upon existing research into the use of innovative eLearning technologies in higher education with particular focus on the academic's perspectives.

How will your privacy be protected?
If you take part in the study, the research team will treat your contributions with the utmost confidentiality and in reporting the findings of this study, we will exclude any identifying information.

What are the benefits of taking part in this research project?
The findings of this project will make a valuable contribution to our understanding of academics' perceptions relating to eLearning and the use of educational technologies. The findings from this study will be presented at school level and at national and international conferences. The findings will also be submitted for publication in peer-reviewed journals. However, no individual participant will be identified in any publication or presentation.

What are the risks of taking part in this research project?
There are no known risks associated with participation.

Contact details for further information
If you have any further questions about the research or would like information on the findings, you can contact Orna O'Brien (orna.obrien@ucd.ie) or Matt Glowatz (matt.glowatz@ucd.ie).

Thank you for taking part in this project.

Q2 How many years have you been teaching, or supporting teaching, in the higher education sector?
❍ Less than 3 years
❍ Between 3 and 5 years
❍ Between 6 and 10 years
❍ More than 10 years

Q3 How many years have you been teaching, or supporting teaching, in UCD's School of Business?
❍ Less than 3 years
❍ Between 3 and 5 years
❍ Between 6 and 10 years
❍ More than 10 years

Q4 Which of the following describes your position in the School of Business?
❍ Professor/Associate Professor
❍ Senior Lecturer
❍ Lecturer
❍ Occasional Lecturer (teaching contract hours)
❍ Researcher (with occasional teaching)
❍ Lecturer (HK, Singapore & Sri Lanka)
❍ Other (please specify) _____

Q5 Which of these devices do you use for general purposes?

	Daily	2-3 Times a Week	Once a Week	2-3 Times a Month	Once a Month	Less than Once a Month	Never
Desktop Computer	❍	❍	❍	❍	❍	❍	❍
Laptop	❍	❍	❍	❍	❍	❍	❍
Tablet, such as iPad	❍	❍	❍	❍	❍	❍	❍
Smartphone	❍	❍	❍	❍	❍	❍	❍
eReader	❍	❍	❍	❍	❍	❍	❍
Other (please specify)	❍	❍	❍	❍	❍	❍	❍

Q6 Which of these devices do you use for teaching-related purposes?

	Daily	2-3 Times a Week	Once a Week	2-3 Times a Month	Once a Month	Less than Once a Month	Never
Desktop Computer	○	○	○	○	○	○	○
Laptop	○	○	○	○	○	○	○
Tablet, such as iPad	○	○	○	○	○	○	○
Smartphone	○	○	○	○	○	○	○
eReader	○	○	○	○	○	○	○
Other (please specify)	○	○	○	○	○	○	○

Q7 Which of the following do you use (general usage)?

	Daily	2-3 Times a Week	Once a Week	2-3 Times a Month	Once a Month	Less than Once a Month	Never
Email	○	○	○	○	○	○	○
Internet	○	○	○	○	○	○	○
Google	○	○	○	○	○	○	○
Facebook	○	○	○	○	○	○	○
Twitter	○	○	○	○	○	○	○
LinkedIn	○	○	○	○	○	○	○
Google+	○	○	○	○	○	○	○
YouTube	○	○	○	○	○	○	○
Video Conferencing (Skype etc)	○	○	○	○	○	○	○
Other (please specify)	○	○	○	○	○	○	○
Other (please specify)	○	○	○	○	○	○	○

Q8 Which of the following do you use for student interaction and teaching-related purposes?

	Daily	2-3 Times a Week	Once a Week	2-3 Times a Month	Once a Month	Less than Once a Month	Never
Email	○	○	○	○	○	○	○
Internet	○	○	○	○	○	○	○
Google	○	○	○	○	○	○	○
Facebook	○	○	○	○	○	○	○
Twitter	○	○	○	○	○	○	○
LinkedIn	○	○	○	○	○	○	○
Google+	○	○	○	○	○	○	○
YouTube	○	○	○	○	○	○	○
Blackboard	○	○	○	○	○	○	○
Moodle	○	○	○	○	○	○	○
Google Drive	○	○	○	○	○	○	○
Google Forms	○	○	○	○	○	○	○
Polling Software	○	○	○	○	○	○	○
Other (please specify)	○	○	○	○	○	○	○
Other (please specify)	○	○	○	○	○	○	○

Q9 Please select the reasons why you have been utilising educational technologies for teaching purposes (multiple answers possible)
❑ Helps me to manage the module
❑ Improves student interaction with me
❑ Provides students with exposure to social media and adds to their skill set
❑ Helps students understand the module material
❑ Students expect the use of social media these days
❑ Helps me update module content on an ongoing basis
❑ Other (please specify) _____

Q10 Indicate which of the following eLearning / learning features (if any) you are currently utilising.

	Daily	2-3 Times a Week	Once a Week	2-3 Times a Month	Once a Month	Less than Once a Month	Never
Document Sharing	❍	❍	❍	❍	❍	❍	❍
Plagiarism Tool	❍	❍	❍	❍	❍	❍	❍
Online Quizzes, such as MCQs	❍	❍	❍	❍	❍	❍	❍
Discussion boards (Blackboard)	❍	❍	❍	❍	❍	❍	❍
Collaboration using Facebook pages	❍	❍	❍	❍	❍	❍	❍
Twitter	❍	❍	❍	❍	❍	❍	❍
YouTube	❍	❍	❍	❍	❍	❍	❍
Wikis	❍	❍	❍	❍	❍	❍	❍
Self and Peer Assessment (WebPA etc)	❍	❍	❍	❍	❍	❍	❍
Learning Journals (Blackboard)	❍	❍	❍	❍	❍	❍	❍
Blackboard Groups	❍	❍	❍	❍	❍	❍	❍
ePortfolio (e.g. Mahara)	❍	❍	❍	❍	❍	❍	❍
Business Simulations	❍	❍	❍	❍	❍	❍	❍
Video Casting	❍	❍	❍	❍	❍	❍	❍
Other (please specify)	❍	❍	❍	❍	❍	❍	❍
Other (please specify)	❍	❍	❍	❍	❍	❍	❍

Q11 Which of the following tools are you currently using to develop teaching and learning resources?

	Daily	2-3 Times a Week	Once a Week	2-3 Times a Month	Once a Month	Less than Once a Month	Never
Word	○	○	○	○	○	○	○
PowerPoint	○	○	○	○	○	○	○
Keynote	○	○	○	○	○	○	○
Prezi	○	○	○	○	○	○	○
YouTube	○	○	○	○	○	○	○
Facebook	○	○	○	○	○	○	○
Twitter	○	○	○	○	○	○	○
Lecture capturing tools (Blackboard Collaborate)	○	○	○	○	○	○	○
Podcasting	○	○	○	○	○	○	○
Personal / subject area web sites	○	○	○	○	○	○	○
Other (please specify)	○	○	○	○	○	○	○
Other (please specify)	○	○	○	○	○	○	○

Q12 Which leads your development of module material where you make use of technology in your teaching?
○ The module concepts / curriculum which are mapped out in advance
○ The technology and what resources might be available to students using that technology
○ A combination of the curriculum and the technology available

Q13 Which of the following statements best describes your expected use of Blackboard by your students?
○ Participation is optional for students
○ Participation is required for students
○ I don't use Blackboard for my teaching

Q14 Indicate your opinion on the following statements regarding eLearning and the use of educational technologies in the higher education sector.

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I am confident integrating and using technology in my teaching	○	○	○	○	○
I am confident in developing and implementing eLearning and educational technologies in my teaching	○	○	○	○	○
I believe students learn more from content made available through blended learning (combination of face-to-face and eLearning)	○	○	○	○	○
I believe students will learn more from 100% face-to-face lectures	○	○	○	○	○
I believe eLearning reduces the academic's workload	○	○	○	○	○
I would consider implementing eLearning initiatives in my teaching	○	○	○	○	○
I prefer not to use eLearning in my teaching	○	○	○	○	○

Q15 Categorise the challenges preventing you from incorporating eLearning into your curriculum design. (Please drag 'items' into the relevant box).

Most Significant Challenge	No Challenge	Medium Challenge
_____ Lack of Time	_____ Lack of Time	_____ Lack of Time
_____ Lack of Resources	_____ Lack of Resources	_____ Lack of Resources
_____ Lack of Training and Support	_____ Lack of Training and Support	_____ Lack of Training and Support
_____ Lack of suitable infrastructure (applications)	_____ Lack of suitable infrastructure (applications)	_____ Lack of suitable infrastructure (applications)
_____ Unstable infrastructure (Internet connectivity)	_____ Unstable infrastructure (Internet connectivity)	_____ Unstable infrastructure (Internet connectivity)
_____ Students don't know how to use eLearning applications	_____ Students don't know how to use eLearning applications	_____ Students don't know how to use eLearning applications
_____ Not a Priority (individual)	_____ Not a Priority (individual)	_____ Not a Priority (individual)
_____ Not a Priority (university/school)	_____ Not a Priority (university/school)	_____ Not a Priority (university/school)
_____ Not appropriate to my module	_____ Not appropriate to my module	_____ Not appropriate to my module

_____ No recognition of individual efforts	_____ No recognition of individual efforts	_____ No recognition of individual efforts
_____ Lack of eLearning knowledge	_____ Lack of eLearning knowledge	_____ Lack of eLearning knowledge
_____ Other (please specify)	_____ Other (please specify)	_____ Other (please specify)
_____ Other (please specify)	_____ Other (please specify)	_____ Other (please specify)
_____ Other (please specify)	_____ Other (please specify)	_____ Other (please specify)

Q16 Categorise the opportunities presented to those utilising eLearning in their teaching. (Please drag 'items' into the relevant box).

Most Significant Opportunity	No Opportunity	Moderate Opportunity
_____ Better lecturer/student collaboration	_____ Better lecturer/student collaboration	_____ Better lecturer/student collaboration
_____ Enhanced student learning	_____ Enhanced student learning	_____ Enhanced student learning
_____ More efficient delivery of module content	_____ More efficient delivery of module content	_____ More efficient delivery of module content
_____ Enhances student engagement	_____ Enhances student engagement	_____ Enhances student engagement
_____ Other (please specify)	_____ Other (please specify)	_____ Other (please specify)
_____ Other (please specify)	_____ Other (please specify)	_____ Other (please specify)
_____ Other (please specify)	_____ Other (please specify)	_____ Other (please specify)

Q17 How interested are you in the following topics?

	Great interest	Some interest	Little or no interest
Learning how to implement eLearning strategies	❍	❍	❍
Designing blended learning	❍	❍	❍
Designing mobile learning	❍	❍	❍
Designing social learning (Facebook)	❍	❍	❍
Designing social learning (Twitter)	❍	❍	❍
Designing social learning (YouTube)	❍	❍	❍
Customizing Blackboard features	❍	❍	❍
Other (please specify)	❍	❍	❍
Other (please specify)	❍	❍	❍

Q18 Please outline any other comments you would like to make in relation to your perceptions of eLearning.