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## DIGITAL LITERACY IN HIGHER EDUCATION: A CASE STUDY OF STUDENT ENGAGEMENT WITH E-TUTORIALS USING BLENDED LEARNING

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### ABSTRACT

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Aim/Purpose	This paper reports on a case study project which had three goals; to develop a suite of original interactive digital skills e-tutorials to be embedded in undergraduate and postgraduate courses; to evaluate the students' experience and engagement with the e-tutorials over one semester; and to explore their general attitudes towards online and blended learning.
Background	Online and blended learning modes continue to grow in popularity in higher education, with the aim of streamlining and enhancing student learning, supporting collaboration and creativity, and equipping students with the skills they will require to work and live in an increasingly digitized world. This practice-based case study highlights factors which positively and negatively affect user engagement with digital learning objects and explores students' perceptions of the role of online learning within their academic programs.
Methodology	A suite of nine interactive e-tutorials, addressing essential digital literacy skills for university students, was developed through instructor and student peer collaboration using Articulate software, informed by best practice. The e-tutorials were embedded in the institutional Learning Management System for three undergraduate and postgraduate courses, in which digital literacy formed the core learning content, to complement classroom-based learning. Students in these courses were surveyed via SurveyMonkey about their specific experience of using the e-tutorials, as well as their general perceptions of digital literacy and online learning. Eighty-six students in total completed the questionnaire, which consisted of twenty-three closed- and open-ended questions.

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Contribution	Through highlighting both the positive and the challenging aspects of the students' reported experience of online learning, this case study contributes useful insights to the body of literature on user engagement with digital learning objects in higher education, as well as students' perceptions and experience of blended learning.
Findings	The e-tutorials were perceived as valuable in reinforcing classroom learning, allowing respondents to revise concepts and materials covered in face-to-face classes, at their own pace and in their own time. Survey responses showed that the accessibility, ease-of-use, design and duration of the e-tutorials were deemed effective in terms of user engagement; however, several technological challenges were identified, such as browser incompatibility, uneven sound quality and general Internet connection issues, which disrupted their learning. Overall, students expressed enjoyment of the learning facilitated by the e-tutorials; however, rather than favoring online learning alone, they expressed a preference for a blended learning environment, with a combination of complementary learning approaches; survey respondents did not generally wish to forego face-to-face classes entirely.
Recommendations for Practitioners	Instructors should seek to strategically embed interactive digital learning objects in their courses at defined points of need in a logical structure, e.g., to reinforce classroom-based learning, or to support specific skill development. Potential disruption to learning should be minimized by following best practice guidelines to ensure ease of access, a seamless user experience, and timely feedback, as well as providing adequate support for rapid resolution of technical glitches.
Recommendations for Researchers	E-tutorials offer a useful means of exploring ways in which students acquire learning in the digital environment. A wider, collaborative exploration is needed to provide comparative studies which move beyond case studies.
Impact on Society	Online learning mechanisms, such as e-tutorials, offer students different means of acquiring essential literacy skills and different ways to interact with content. E-tutorials constitute reusable learning objects, which can be accessed as just-in-time delivery modes, when students perceive they need to review particular skills or reinforce learning material.
Future Research	This research is now expanding into different types of reusable learning objects. E-tutorials may be developed in multiple ways, and comparative research around e-tutorial models will deepen our understanding of how students interact with content in formal learning contexts. As the digital educational landscape continues to expand alongside traditional face-to-face and analogue learning modes, a key research focus will be student and instructor perceptions and experience of blended learning in different contexts.
Keywords	blended learning, digital literacy, e-learning, e-tutorials, higher education, online learning, online tutorials

## INTRODUCTION

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Models of online and blended learning continue to grow in popularity in higher education, as institutions seek to support and facilitate modern, flexible educational opportunities for students, and create interactive digital learning experiences that are engaging and effective in undergraduate and post-

graduate education (Mery & Newby, 2014). In part, the challenge of providing an interactive learning experience for students in large class groups and concerns about the quality of pedagogy in this environment have been key catalysts for the reconsideration of teaching approaches in higher education (Hornsby & Osman, 2014), as well as the general desire to harness emerging Web- and cloud-based technologies to provide “greater, more diverse access to learning resources” to overcome issues of distance between learners and instructors, and to facilitate increased peer interaction and collaboration (Siemens, Gašević, & Dawson, 2015, p.60). For information and digital literacy skills development, in particular, the adoption of online modes is increasingly popular, particularly when the courses in question are embedded within academic curricula and delivered at point-of-need:

*With the focus in higher education on the importance of graduate attributes and the increasing number of teaching and learning activities being delivered via technology, online information literacy courses appear to be an effective way of delivering information literacy and information technology skills to students (Johnston, 2010, p. 208).*

Blended learning, also known as hybrid or mixed-mode learning, constitutes an evolving research field within the broader area of online learning, and refers to instructional practices which combine traditional face-to-face (F2F) approaches with online learning or technology-mediated modes. During the past decade, key themes in the research literature on blended learning have included multiple, primarily quantitative, studies on the effectiveness of blended learning; several reviews of instructional practice in blended learning design and some research into the question of institutional adoption of blended learning (Siemens, Gašević, & Dawson, 2015). However, despite the growing number of studies in this area, there is still relatively “limited evidence as to what particular methods of blending impact academic achievement” as well as a lack of theoretical development within the blended learning field itself (Siemens et al., 2015, p. 83). While research seems to show that blended learning has an overall positive effect on student learning, results are inconsistent, with some suggesting no particular difference between modes. It is also unclear as to which specific aspects of blended learning have the most impact on learning (e.g., Weightman., Farnell, Morris, Strange, & Hallam, 2017). Moreover, the focus on quantitative measurement of academic attainment (e.g., pre- and post-tests) that has dominated previous research (Siemens, Gašević, & Dawson, 2015) does not take account of the contextual and personal nuances that contribute to a high-quality student learning experience.

From a wider perspective, the critical need for digital literacy development in higher education is evident through the strategic priorities expressed by the highest levels of governance, both nationally and internationally. In 2006, “digital competence” was adopted by the European Parliament and Council as one of eight ‘Key Competences for Lifelong Learning’ (European Commission, n.d.), and was defined as “the confident, critical and creative use of ICT to achieve goals related to work, employability, learning, leisure, inclusion and/or participation in society” (Ferrari, 2012). In the UK, the extensive JISC Digital Literacies (2011-2013) and Building Digital Capability (2014-2018) projects sought to directly address the challenges faced by higher education institutions in creating both a suitable technical infrastructure, and a learning environment that is conducive to developing digital capability in staff and students, and to suggest achievable strategies for embedding core digital skills in academic curricula. More recently, the European Commission’s Digital Education Action Plan (European Commission, 2018) sets out a comprehensive strategy to support technology-use and digital competence development in education, noting that “Digital technology enriches learning in a variety of ways and offers learning opportunities, which must be accessible to all. It opens up access to a wealth of information and resources.”

In terms of the benefits afforded by digital literacy, the UK-based Higher Education Academy notes that “students who develop digital literacies as an integral part of their learning are more effective in their study and more employable on graduation,” while staff who are digitally fluent “can blend many innovative pedagogical practices such as flipped learning, digital curation, and m-learning techniques, and use open educational resources (OEDs) to their maximum benefit” (Higher Education Academy, 2017).

Therefore, for instructors in higher education there appears to be some tension between the imperative to adopt technology-enabled modes and support students' digital literacy development, and the corresponding lack of clear and consistent evidence regarding the effectiveness of these approaches for learning and student engagement. Academic teaching faculty, librarians, technicians, and other learning support specialists share the common purpose of negotiating a technology-enabled learning environment that blends effectively with established approaches and maintains high pedagogical standards, while also meeting the expectations of university students regarding the use of technology in learning and research, as well as for their future careers. The need to justify the physical resources, costs, and instructor time allocated to the development and implementation of blended learning modes further underpins the usefulness of practice-oriented research studies which explore the elements of online and blended learning, have the most positive educational impact in different contexts, and result in the highest levels of student satisfaction and engagement. This paper reports on direct student experience of blended learning through their engagement with original digital learning objects (DLOs) in undergraduate and postgraduate courses. A survey of students' experience of online learning through these reusable learning objects offers valuable insights into how they engage with digitally-enabled learning.

## LITERATURE REVIEW

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### *DIGITAL LITERACY*

The thoughtful adoption of digital learning modes in higher education supports the development of digitally literate students, who can operate comfortably and creatively in technology-enabled environments in all aspects of their lives. Digital literacy, as a concept, has been discussed and critiqued by multiple authors since the 1990s, including Gilster (1997), Bawden (2001; 2008), Lankshear and Knobel (2008), Littlejohn, Beetham and McGill (2012) and Ala-Mutka (2011). A popular definition describes digital literacy as the

*Awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process* (Martin & Grudziecki, 2006, p. 255).

The knowledge, skills and attributes associated with being digitally literate are identified in several recent models and frameworks, including the European Commission's Digital Competence Framework 2.1 (Carretero, Vuorikari & Punie, 2018), which is structured dimensionally, and includes five "components of digital competence": information and data literacy, communication and collaboration, digital content creation, safety, and problem solving. Within these categories are specific sub-competences, which can be measured across eight levels of proficiency, ranging from "foundation" to "highly specialized." Digital literacy models developed specifically for higher education, such as the seven elements representation proposed by JISC in the UK (2014) and Ireland's National Forum for the Enhancement of Teaching & Learning's "Metro Map" (National Forum for the Enhancement of Teaching & Learning, 2015), have attempted to capture the multi-faceted, yet overlapping range of capabilities and practices that have evolved in response to the emerging digitization of academic and professional life. For example, the JISC (2014) model includes capabilities, such as Digital Scholarship, Communications and Collaboration, and Career and Identity Management, while the Metro Map suggests Tools and Technologies, Create and Innovate, and Identity and Wellbeing as categories for digital skill development. While formal education is the primary context here, it is, however, important to view digital literacy for learning through a broader and more inclusive lens, envisaging a world beyond the structured environment of formal education:

*Digital literacy should be positioned as an entitlement for students that supports their full participation in a society in which social, cultural, political, and financial life are increasingly mediated by digital literacies* (Spires & Bartlett, 2012, p. 4).

## ***DIGITAL LEARNING***

Several areas comprise the concept of digital learning. Blended learning, also known as hybrid learning and mixed-mode learning, refers to a learning framework that combines both digital and face-to-face learning contexts. The nature of blended learning can vary widely. For example, learning may be positioned as face-to-face classroom instruction combined with exercises online or may take the form of podcasts or synchronous discussion online, followed by face-to-face meetings with a tutor or lab instruction. The technological possibilities continue to evolve.

E-learning refers to learning that occurs through computer-mediated opportunities, such as using computers or mobile phones, to access content made available online. Researchers have observed that e-learning transcends time and place, enabling learning and teaching to occur at any location at any time, as well as facilitating wider inclusion of learners, such as the unemployed (Islam, Kunifuji, Hayama & Miura, 2011). In addition, researchers have noted a positive student attitude toward e-learning, where systems are easy to use and relevant to course work (Ademole-Odeshi, 2014). E-learning is widely employed in higher education, as well as in the more public domain, via a range of tools supporting digital learning, such as instructional videos produced by subject experts and members of the public.

E-learning can span multiple online learning opportunities, of which the e-tutorial represents one form. An e-tutorial captures information about a particular topic visually and orally, providing instruction in a brief session online, often interactively and/or incorporating multimedia elements, such as video, screen-casted instructions, and quizzes. Software products, such as Articulate, Camtasia, and Captivate, support the development of e-tutorial content, enabling student access through institutional virtual learning environments (VLEs).

## ***PERSPECTIVES AND CHALLENGES AROUND DIGITAL LEARNING***

Digital learning opportunities, such as the e-tutorial, can offer critical learning points during the learning process, enhancing and deepening students' understanding of particular topics. Students, however, can have mixed experiences of digital learning. For instance, Loh, Wong, Quasi and Kingshott (2016) found that students identified flexibility and learning achievements as the strengths of e-learning. Flexibility offered self-paced learning and anywhere-anytime completion. On the downside, students perceived difficulties with collaborative opportunities and accessing materials online. Students also have expectations, such as the incorporation of visual information in online learning, to help them stay alert and focused (Michael, 2012).

Mestre (2012) compared students' use of a screencast library tutorial with a web-based tutorial with screenshots and found that students were better at re-creating tasks when using the screenshots in the web-based tutorial. Paechter, Maier and Macher (2010) found that students who took advantage of self-paced and collaborative learning opportunities were more likely to learn more. Students' achievement goals were related to perceived learning goals, leading the authors to suggest e-learning course design should provide self-paced learning and self-testing to measure continuous learning progress. In addition, students valued instructors' expertise with e-learning and support for learning online, suggesting that instructor training is a key component of learning in the digital environment. Carré (2017) found that an instructional designer can also effectively help faculty members convert their courses to online offerings.

Although e-learning has now been around for some time, there are still many instructors who have not adopted this form of learning (Vandenhouten, Gallagher-Lepak, Reilly, & Ralston-Berg, 2014). They identify team collaboration in the shift from face-to-face learning to e-learning as a significant challenge. Barber and King (2016) observed that digital teaching and learning pose significant pedagogical changes for higher education instructors, enabling them to become "facilitators, guides, collaborators and learners themselves," as opposed to traditional instructors (p. 235). In spite of the potential for instructor learning, Gonzáles (2012) found that university instructors held mixed per-

ceptions of e-learning opportunities; some instructors perceived a number of challenges to implementing e-learning, including a lack of training to use technologies supporting e-learning, additional time needed for teaching, computer competencies needed, and perceptions of students' abilities to take advantage of e-learning. Martins and Nunes (2016) suggested that the development of faculty trust, supported by an institutional approach, is essential to achieve the uptake of e-learning in higher education. This finding is echoed by the Organization for Economic Cooperation and Development (OECD) (2016), which reported that teaching should precede technology in importance, with digital technologies incorporated into education where they will have a positive impact on learning.

### ***BEST PRACTICE IN E-TUTORIAL DESIGN***

The design of DLOs does not occur in a vacuum but should be considered within the broader framework of the learning environment and curriculum as a whole. The intended learning outcomes, in addition to the structure, format and progression of a learning experience, and the points at which digital learning is deployed, are key considerations. As Oliver and Herrington (2001) point out that

*The learning environment needs to provide the learners with a raft of motivating and engaging tasks that cause the learner to make choices and decisions in the learning process, to reflect on what is being learned, to articulate and to share the new ideas and knowledge that is being acquired with others (p. 32).*

The principle of “constructive alignment” applies, not just to digital learning, but to general pedagogical planning (Biggs & Tang, 2007). Planning digital learning activities must begin with consideration of the overall learning outcomes that students should achieve on completion of the lessons; the appropriateness of DLOs in facilitating these outcomes is a secondary consideration. Stein and Graham (2014) argue that simply adding digital components to an existing course is not sufficient to fully realize the benefits of blended learning; rather, “teachers need to go beyond a simple ‘digital facelift’; instead, teachers should aim to create transformative blends through an intentional course redesign process” (p. 9).

Oliver and Herrington's (2001) framework for online learning design is a useful model for planning the overall blended learning experience. Their model constitutes three interlocking concepts, which are critical components of the learning environment, namely: learning tasks to provide purpose and context, e.g., role-play, tutorials, quizzes; learning resources to expose learners to different perspectives in multiple formats; and learning supports to provide learners with timely assistance and feedback. When considered together, these components offer guidance regarding how DLOs should be most effectively used to support a constructivist learning experience; rather than simply adding digital objects to the existing curriculum structure or VLE, the model encourages a more creative way of thinking about learning design, in which the deployment of technology is secondary to the learning outcomes and tasks which give shape to the learning environment.

### ***DESIGN OF E-TUTORIALS TO FACILITATE OPTIMAL LEARNING***

From the micro-perspective of e-tutorial design for information and digital literacy, years of experimentation in different contexts and settings have produced multiple accounts of best practice (Blevins, Deberg, & Childs, 2014; Blummer & Kritskaya, 2009; Bowles-Terry, Hensley, & Hinchliffe, 2010; Clark & Mayer, 2011; Hess, 2013, 2014; Mayer, 2014; Oud, 2009; Scales, Nicol, & Johnson, 2014; Weeks & Davis, 2017). From a review of best practices in online tutorial development in libraries, Blummer and Kritskaya (2009) identified numerous critical success factors, and proposed five best practices for instructors, which included clearly establishing the online tutorial's objectives and requirements through pre-testing and user needs' analysis; using relevant standards to guide the online tutorial development, where appropriate; collaborating with others to improve the online tutorial's content and design; increasing user engagement with the online tutorial through active learning strategies, clear navigational design, relevant content, and easy access to support; and including an evaluative component in the online tutorial to facilitate accurate assessment. Plumb (2010) also advo-

cated best practices which addressed both student engagement and technical concerns; for instance, creating shorter e-tutorials to facilitate the user's attention span and accommodate technological considerations, such as loading time and ease of editing; developing e-tutorials that can be transferred when technology changes; scripting e-tutorials to facilitate recording; anticipating software flaws and testing e-tutorials using different computers, browsers, and plugins, as well as back up e-tutorial files; and having the confidence to experiment with the software. Hess (2013) identified five key principles to guide the evaluation of current tutorial offerings and development of future online tutorials: the MAGIC principles proposed that tutorials should be Maintainable, Available, G geared at Users, Informative, and Customizable, in order to be as effective as possible.

Research in cognitive psychology has shown that multimedia learning places extremely high demands on an individual's short-term memory processing and that it should only be used when it is the most effective means of achieving learning objectives (Oud, 2009). This concept is based on Cognitive Load Theory (CLT), which "asserts that optimal learning happens when the demand put on the learner's 'working memory' meets his or her ability to sensually process the information presented" (Scales et al., 2014, p. 244). Instructional designers can minimize pressure on cognitive load through strategies such as simplifying content by focusing on key points, using words combined with graphics, providing an outline at the start and a summary on completion, splitting content into short segments, and ensuring that technical issues, such as navigational inconsistencies, do not detract from engagement with content. Pitching the content at the appropriate level and removing any material that does not directly contribute to the main points, especially decorative graphics or visuals, offer additional considerations. Other strategies include

*Providing interactive practice activities, allowing students to have control over the pace of a screencast, including feedback to students, encouraging critical thinking by putting concrete actions and steps into a broader conceptual framework, and designing screencast tutorials around what students already know" (Oud, 2009, p. 174).*

In addition to this list, Weeks and Putnam-Davis (2017) further identified the following essential practices: writing a clear and simple script; limiting e-tutorials to 1-2 minutes; placing or linking the e-tutorial at the point-of-need; and promoting the e-tutorial to the target audience.

## ***LITERATURE REVIEW SUMMARY***

Digital learning, which spans a range of formats, included blended learning and e-learning, has opened up extensive opportunities for instructors to vary their teaching approaches, and to create tailored learning experiences which engage their students across multiple platforms and technologies. E-tutorials, in particular, constitute a creative and flexible resource, which can be strategically embedded at critical learning points in a curriculum, combining text, images, audio, and video to offer immersive learning experiences. While students have been generally shown to respond positively to digital learning, several challenges may, however, affect the successful implementation of digital learning in higher education. For example, issues with access and navigation, along with general technical glitches, may disrupt student learning and cause frustration and disengagement. Collaboration in the online space may also prove challenging when adequate support is not provided. On a macro level, pedagogical know-how and technical expertise among teaching faculty may be inconsistent, with negative or passive institutional attitudes towards the adoption of digital modes. Research has also shown that the true impact of digital and blended modes on student learning outcomes is difficult to assess accurately; however, there is a general consensus in the literature that for effective technologically-enabled learning to take place, consideration of learning outcomes and overall pedagogical structure must take precedence over the simple addition of digital resources to existing curricula. For e-tutorials, careful design should seek to minimize pressure on the learner's cognitive load; to ensure this outcome, strategies include focusing on key points or segmenting content; limiting the duration of the e-tutorial; minimizing the use of decorative graphics; providing clear navigation controls; and including interactive elements to encourage engagement and reinforce learning.

## RESEARCH OBJECTIVES

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This project had the following objectives:

- To create and implement a suite of reusable interactive digital learning objects to facilitate the learning of basic information and digital literacy skills in undergraduate and postgraduate curricula
- To evaluate our students' perceptions and experience of the online learning facilitated by their engagement with the e-tutorials in their courses
- To explore our students' general attitudes to online and blended learning.

Understanding the students' experiences with the e-tutorials was important for improving student learning and engagement on relevant courses, as well as contributing to the wider body of existing research into student engagement with e-learning.

Key areas of exploration included the following:

- How did students engage with e-tutorials in the learning process?
- What features of the e-tutorials enhanced or disrupted their learning?
- To what extent did students perceive that the e-tutorials contribute to their overall learning?
- How did students view online learning in general?
- How could e-tutorial development offer a new approach to blended learning in our school?

Although a short description of the creation and development of the e-tutorials is included, this paper reports primarily on findings related to the second and third research objectives stated above.

## METHOD

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### *RESEARCH DESIGN*

The overall design of this study constituted a practice-based Case Study approach, defined as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context” (Yin, 2008, p. 23). The study focused on direct student experience of online learning in a real-life context, i.e., while the learning experience was ongoing.

### *E-TUTORIAL CREATION AND IMPLEMENTATION*

For the purposes of this study, a suite of basic information and digital literacy e-tutorials were developed in-house, building on previous work in the school. In line with the best practices reported in the literature, the e-tutorials combined text, image, audio, video, and interactive quiz components to present a dynamic, interactive experience for the students. An effort was made to keep the lessons under 10 minutes in length, and to use minimal text focusing on key points. E-tutorials addressed essential information and digital literacy skills for both undergraduate and postgraduate audiences, focusing on the following skills areas: *Advanced Searching Techniques*; *APA Referencing*; *Boolean Logic & Basic Search Strategies*; *Evaluating Digital Information*; *How to Create a Wiki in Blackboard*; *How to find an Article*; *How to find a Book using Catalogues*; *How to find Factual Information*; and *Teamwork: How to Collaborate Effectively*. To ensure a blended learning experience that was constructively aligned with course learning outcomes and based on Oliver and Herrington's (2001) framework, the e-tutorials were woven strategically into course curricula to support the attainment of specific learning outcomes and to reinforce content covered in face-to-face sessions and independent study. Importantly, the e-tutorials were included as part of overall course assessment, to ensure that students completed them. A decision was made to allow the students as many attempts at the quizzes as was necessary to achieve 100%, rather than allowing them just a single attempt; this fitted with the overall aim of the e-tutorials, which was to reinforce and enhance learning, rather than assess and highlight skill deficits. E-tutorials were embedded in three of the school's courses (two undergraduate and one postgradu-



ate) in the university's VLE, Blackboard, which supports SCORM standards for e-learning interoperability. Integrating the e-tutorials with the VLE's Assignments function enabled the researchers to track the number of attempts made by each student to complete the quizzes at the end of each e-tutorial, which are automatically recorded in chronological order; only the attempt that led to 100% was included in the overall course grade, and students were not penalized for multiple attempts. Figure 1 shows a sample screenshot from the e-tutorial, *Evaluating Digital Information*.



Figure 1. Screenshot from e-tutorial, *Evaluating Digital Information*

The courses in which the e-tutorials were embedded were selected specifically for their pedagogical focus on information and digital literacy skills and competencies:

- **IS10050 Digital Judgement** is a foundational digital skills course, taken by students in the first year of their undergraduate degree programs. In this course, students learn to act as intelligent digital judges, exploring the world of digital information and social media, to empower them to identify, access, evaluate, use, create and share trustworthy digital information in personal, professional, and academic contexts.
- **IS20010 Advanced Information Skills** is a second-year undergraduate course that challenges students to develop information and digital literacy competencies that will make them skillful users and creators of information; during the course, students develop essential skills to find, evaluate, use, and manage information effectively in their studies, daily lives, and future careers in public and private enterprise
- **IS40530 Information & Reference Services** is a postgraduate course on the professional MLIS degree program, that introduces the information professional to information provision and information services in various contexts, focusing on both the theory and practice behind locating, evaluating, and using resources and developing and delivering information services.

In each course, the e-tutorials were made available on Blackboard at strategic points, aligned with material covered in class in specific weeks. In some cases, (e.g., IS10050) a face-to-face class was fol-

lowed by a free session, in which students were required to complete the related e-tutorial, for immediate reinforcement of the concepts discussed in class (e.g., evaluating digital information).

### ***E-TUTORIAL EVALUATION SURVEY***

To explore students' experience of the e-tutorials, the researchers adopted a descriptive survey approach, which aims to "describe a situation and/or look for trends and patterns with the sample group" (Pickard, 2013, p. 112). Students taking the three courses which included e-tutorials were invited to evaluate their experience of the e-tutorials, and to offer their perspectives on online learning via an online survey. The researchers created a twenty-three-item questionnaire, containing both closed and open-ended questions (see the Appendix). The survey questionnaire underwent multiple iterations and revisions, before being distributed through the SurveyMonkey website. Several descriptive questions were included to establish the demographics of the population (i.e., gender, age range, stage in studies, choice of courses as electives or program options, self-rating of digital literacy, previous experience of e-learning). Questions were developed to evaluate the students' experiences in relation to specific physical and technical attributes of the e-tutorials, as well as their perceptions of the relevance of the e-tutorials to the course content, and their general attitudes towards online learning. To evaluate the students' overall experience of the e-tutorials they had engaged with, a series of statements were developed by the researchers, from which four-point Likert-scale questions were created. The Likert statements were informed by literature review, which identified the key elements that influence how students learn from e-tutorials (e.g., amount of information included; layout and navigation controls; audiovisual quality). The respondents were asked to indicate their agreement with each statement for every e-tutorial they completed. For each Likert-scale question, respondents were also invited to explain their ratings by submitting comments in an optional text-box. Finally, two open-ended questions were included to allow respondents to offer more in-depth personal insights:

- Overall, how do you believe that online learning compares to learning in the classroom?
- Please add any further comments that you would like to make about the e-tutorials.

### ***ETHICS***

The university's Research Ethics Committee assigned the following ethics research number to the project: HS-E-13-94-Fulton. While all students were required to complete the e-tutorials as part of their coursework, participation in the evaluative survey was voluntary. The email inviting students to participate in the survey contained the following statement: "Participation is voluntary. Data collected will be anonymous and you will not be identified in our final report." This was also reiterated in a statement at the beginning of the online questionnaire. No personally identifying information was collected from respondents.

### ***SURVEY POPULATION***

The total survey population consisted of 274 students across three courses. Respondents included undergraduate students in their first, second and final years, as well as postgraduate students in the School of Information & Communication Studies (then called the School of Information & Library Studies). A total of 86 (31%) students spread across the courses completed the survey, which approximated anticipated online survey outcomes in research (Nulty, 2008). Proportionally, a greater percentage of postgraduates (n=19 out of 35 surveyed, 54%) participated than undergraduates (n=64 out of 239, 27%).

### ***DATA ANALYSIS***

Data collected were aggregated for analysis; descriptive statistics highlighted the key preferences of the respondents. This study was not concerned with the effect of gender or age - rather, an overview

of the respondents' experience was sought, with open-ended answers identifying key issues and themes that enhanced or impacted on the learner experience.

Answers to the open-ended questions were hand-coded individually by each researcher at first, following a line-by-line, constant comparative approach, to extrapolate key themes. Following this process, themes identified by each researcher were compared and discussed, and a final list of themes was agreed. Quantitative and qualitative responses were also considered together to capture an overall view of student experiences of e-tutorials, with depth added by qualitative data.

Because this was an exploratory case study, findings are not generalizable, and relate specifically to this case. Data captured initial findings for the project, which may be used not only to inform pedagogical decision making around how we use the e-tutorials in blended learning, but also, importantly, to understand students' perceptions of e-tutorials and ways to tailor this mode of learning to address their viewpoints for future course offerings.

## FINDINGS

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### *POPULATION DEMOGRAPHICS*

All survey respondents were students enrolled in the courses taught in the school outlined above. The majority were female (women, n=49, 59%; men, n=34, 41%). Most students were aged between seventeen to twenty years (n=43, 51.81%) or in their twenties (21-29 years, n=28, 33.73%). A minority were aged thirty or more years (30-39 years, n=9, 10.84%; 40-49 years, n=2, 2.40%; 50-59 years, n=1, 1.20%). Respondents were at different points in their university careers, including postgraduates (n=19, 22.89%) and undergraduates (n=64, 77.11%), with undergraduates participating from first (n=37, 44.58%), second (n=11, 13.25%), and final (n=16, 19.28%) years of their programs. Two of the three courses containing e-tutorials were core program courses, rather than electives.

### *PERCEPTIONS OF DIGITAL LITERACY AND EXPERIENCE OF ONLINE LEARNING*

The students were asked to self-rate their digital literacy, to provide some context regarding perceived self-efficacy in technology use. Most students evaluated their digital literacy levels positively. Out of 85 responses, a small number considered their digital literacy to be excellent (n=6, 7.06%), while the majority believed their digital literacy to be very good (n=32, 37.65%) or good (n=33, 38.82%). A smaller number rated their digital literacy as adequate (n=14, 16.47%). For those students who felt that they could improve their digital literacy, they explained that the volume and constantly changing nature of what they felt they needed to learn contributed to their current self-ratings:

*Not excellent, because there is still a lot to learn that wasn't on the course. Always more learning.*

*Everything is developing so fast [sic] that I find it very hard to keep up with it. So that means that I might not have the knowledge of the newest technologies and trends.*

Students were also asked if the e-tutorials constituted their first experience of online learning. This was the case for most (n=51, 61%), while around a third stated that they had previously participated in online learning (n=30, 35.29%). Four respondents (4.71%) were unsure. Those with online learning experience reported previous engagement with a wide variety of tools and platforms, including e-tutorials, VLEs like Moodle and Blackboard, web tutorials and webinars, YouTube videos, computer coding, information retrieval systems, the ICDL/ECDL (International Computer Driving License certification) in secondary school, and websites.

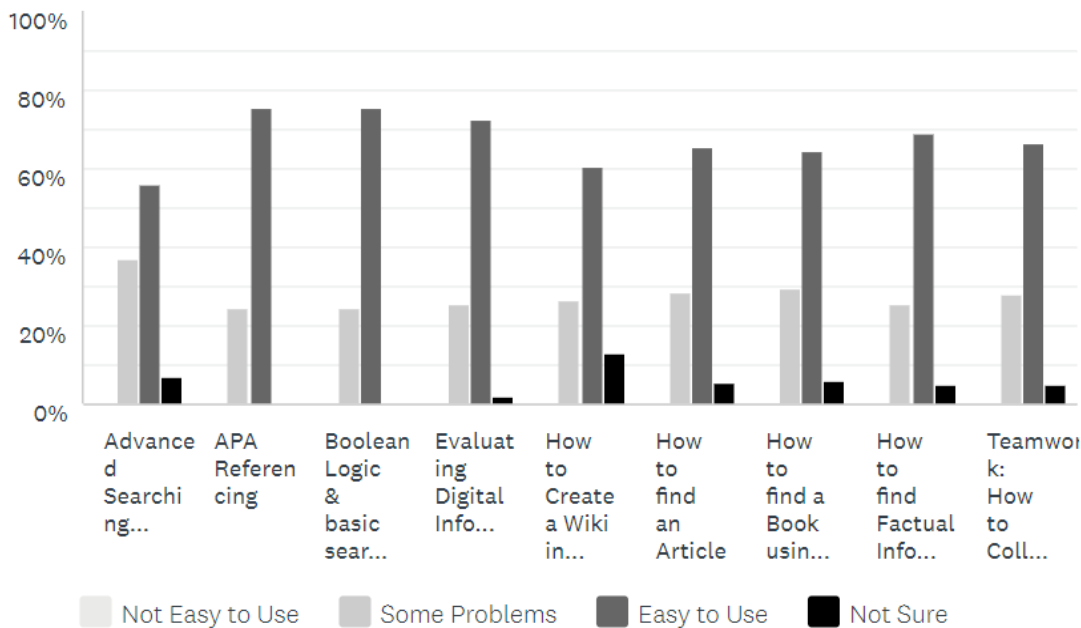
### *PERCEPTIONS OF E-TUTORIAL DESIGN AND USABILITY*

Students were asked to respond to several questions relating to e-tutorial design, content and usability, in order to assess whether any physical design or access issues had affected their engagement and

ability to complete each e-tutorial fully. For each e-tutorial completed, they were asked to rate a specific element pertaining to design and ease of use, using four-item Likert Scales to indicate their rating:

- The e-tutorials were easy to find and access in Blackboard (the VLE)
- How would you rate the amount of information included in the e-tutorials?
- How would you rate the clarity and layout of information on slides in the e-tutorials?
- How would you rate the ease-of-use and navigation of the slides in the e-tutorials?
- How would you rate the quality of the videos included in the e-tutorials?

With some minor variations between e-tutorials, overall results suggested that the respondents' experiences were positive in terms of access and ease-of-use. In designing the e-tutorials, a key aim was to establish the optimal amount of content for effectively learning about a particular concept. The reaction of students to this question suggested that the adopted format of ten content slides or videos, followed by a ten-question quiz worked well. Of those who answered the question, most assessed the e-tutorials as easy-to-use and navigate. Figure 2 shows the respondents' ratings for this question.



**Figure 2. How would you rate the ease-of-use and navigation of the slides in the e-tutorials? (n=57)**

The open-ended comments revealed more in-depth details about the students' engagement with the e-tutorials. Students were forthcoming about the technological aspects; favored features included the audio, which *“made the information easy to follow.”* However, some respondents found the navigation between pop-out videos and the e-tutorials difficult, highlighting problems when technological issues arose. When asked specifically about the video content in the e-tutorials, some respondents added comments noting technical issues around audio volume and video function. Regarding the content of the videos, one respondent added a comment emphasizing how much they liked the stepwise nature of the content:

*Especially liked the step-by-step videos of how to find and locate certain information, such as locating the LIS A database through the UCD information library website.*

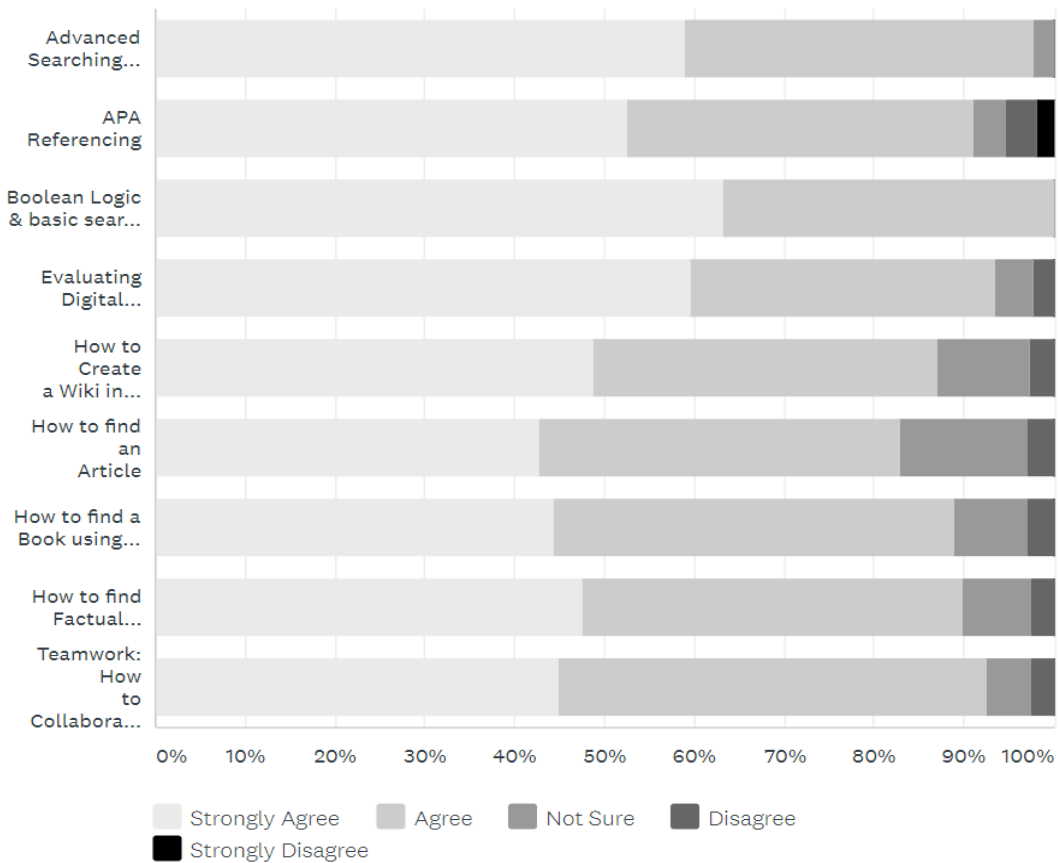
The ability to navigate back and forth was deemed useful for those in the midst of the e-tutorials; however, one student also wanted the option for backward navigation to be available during the quiz,

while another student disliked having to move forward through the entire quiz to completion, rather than being able to exit early.

The length of time students needed to fully complete the e-tutorials was also important in assessing quality of engagement. Each e-tutorial was designed to take approximately ten to fifteen minutes to complete, and e-tutorials were only considered fully completed when all quiz questions had been answered correctly. Students were allowed unlimited quiz attempts to achieve completion. Student responses about length of time to complete e-tutorials, however, ranged widely from a few minutes to three hours; the most commonly reported length of time spent on completing e-tutorials was thirty minutes. One of the advantages of the e-tutorials was that students could take as long as they needed to complete and review the content. It appeared that students varied individually in the time they dedicated to e-tutorials, for several possible reasons; for example, familiarity with content, technological issues, and learning patterns.

***PERCEPTIONS OF LEARNING SUPPORTED BY E-TUTORIALS***

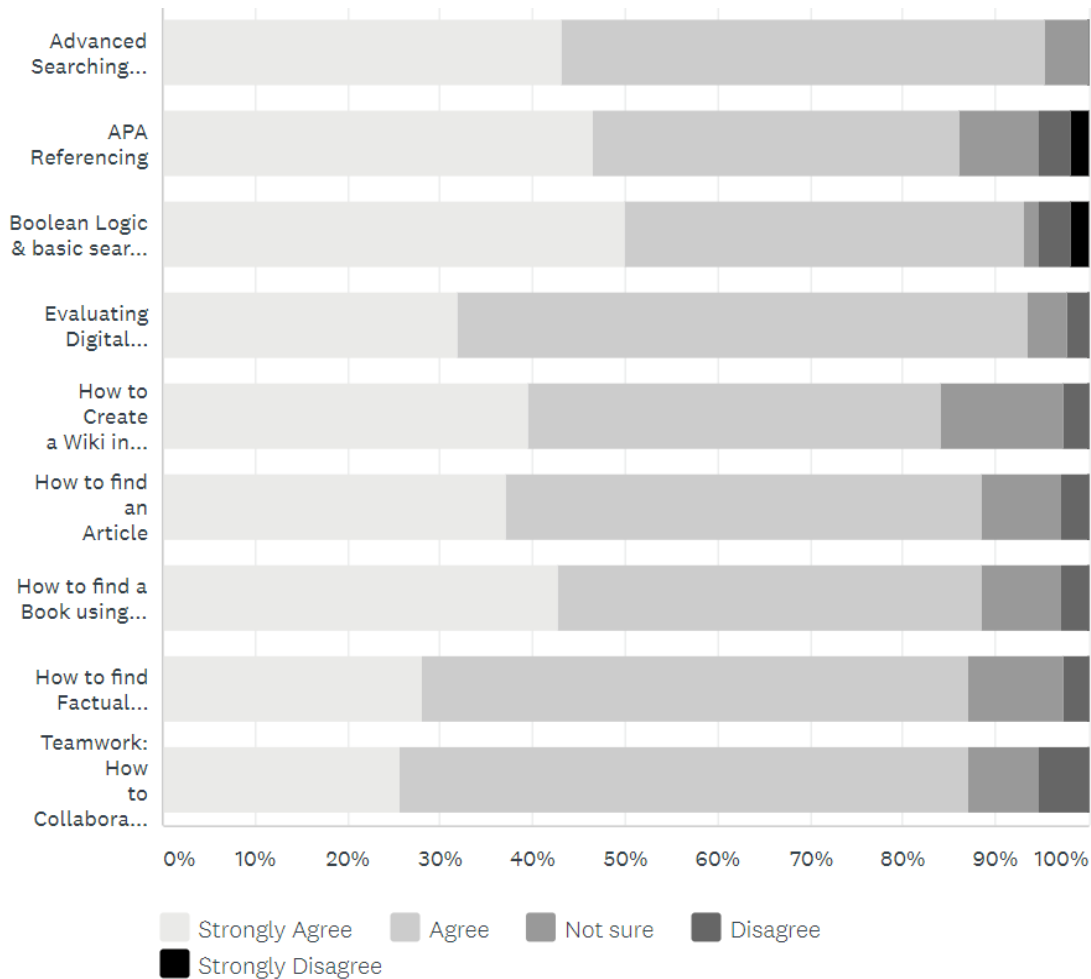
The e-tutorials were designed to form part of a structured blended learning environment, which was conducive to the attainment of course learning outcomes; the e-tutorials were therefore embedded in specific courses with the aim of supplementing and enhancing classroom-based learning, rather than as standalone learning activities. To evaluate the success of this approach, students were asked a series of questions relating specifically to the perceived effect of the e-tutorials on their overall learning experience on a given course. Using Likert Scales, survey respondents rated their agreement with specific statements, adding comments where desired.



**Figure 3. The e-tutorials were relevant to the content of the module**

One question in the survey sought the students' perceptions of the relevance of the e-tutorials to the courses in which they were embedded. As Figure 3 shows, respondents almost unanimously agreed or strongly agreed with the statement: *The e-tutorials were relevant to the content of the module.*

A related question sought to determine whether students felt that completing the e-tutorials resulted in an improved understanding of the topics they addressed. As Figure 4 shows, students responded positively overall, with the majority either agreeing or strongly agreeing with the statement, *“The e-tutorials helped me to better understand the subjects they were about”*.



**Figure 4. The e-tutorials helped me to better understand the subjects they were about (N=57)**

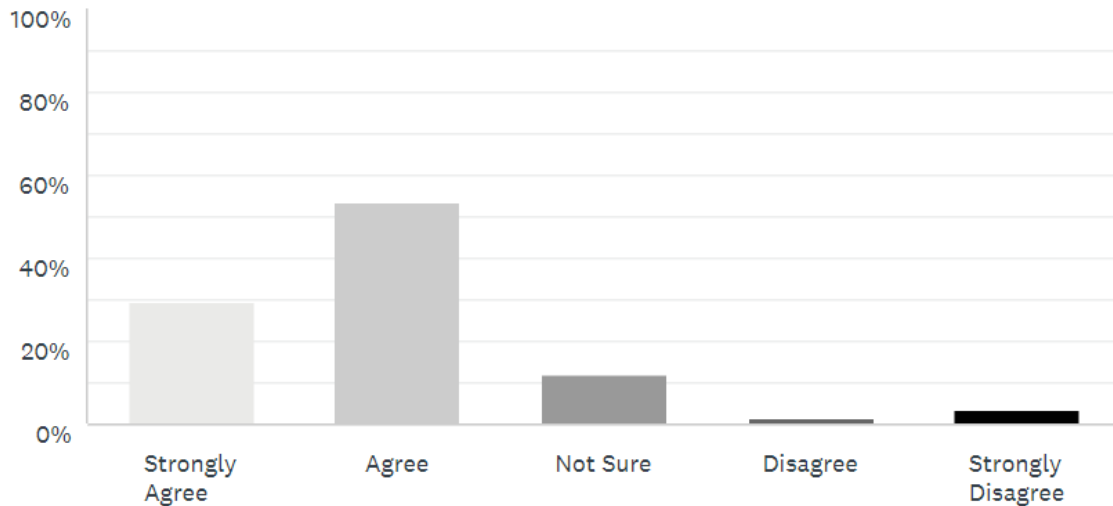
In the open-ended comments, one student summed up the usefulness of the e-tutorials as reference tools to reinforce acquired skills:

*I found some of the e-tutorials very useful as references. Even if I knew how to do the activity, it was handy to refer back to the e-tutorial, esp. the APA referencing tutorial.*

A couple of respondents commented that they found certain content more challenging, while others stated that the content seemed easy to them because it was a review of material they had been exposed to elsewhere in their programs, which gave us food for thought about the level of the materials in the e-tutorials; however, these same respondents deemed the content appropriate for new learners:

*A lot of the information was not new for me. But I think the level was okay for new-learners.*

The respondents were also asked if they believed that the e-tutorials had enhanced their learning. As Figure 5 shows, most respondents either strongly agreed or agreed that this was the case.

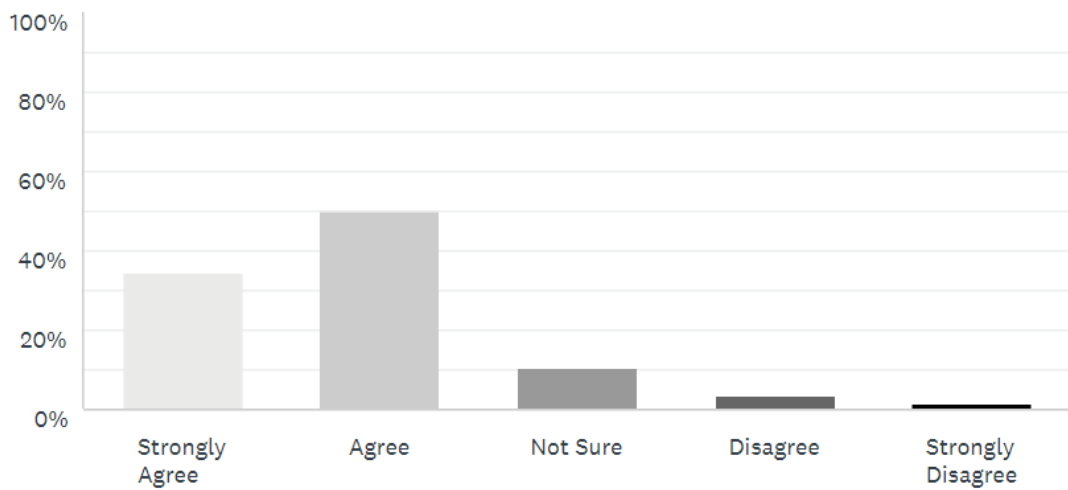


**Figure 5. The e-tutorials enhanced my learning in my program of study**

Comments indicated that the respondents perceived the e-tutorials as connected to learning in lectures, as reinforcing classroom learning, and as assisting students with assessment. As one student suggested:

*It was a good reference tool to refer back to. As they had to be done before class, and you had to listen and physically do a quiz, you were able to remember the information before the lecture, so it made the lecture more understandable when attending it.*

Students were asked if they had enjoyed working on the e-tutorials from an overall perspective. As Figure 6 shows, the majority either agreed or strongly agreed that they had enjoyed them.



**Figure 6. I enjoyed working on the e-tutorials**

Students noted that the e-tutorials served as a “*good break in the normal teaching*”; that they represented “*easy participation marks*”; and that they were useful for “*reinforcing learning of materials covered in class.*” One student stated that they felt that there “*needs to be a good mix*” and that the e-tutorials were good for “*revising and practicing.*”

A further indicator of student satisfaction concerned students’ stated preferences for similar e-tutorials in their other courses. Respondents mostly agreed or strongly agreed that they would like to see e-tutorials rolled out to other courses (Figure 7). This level of agreement suggested a generally positive outlook, regarding e-tutorials as part of academic study.

To follow up, respondents were asked what topics they would like additional e-tutorials to cover. Answers included the following:

- APA Referencing (an additional, more in-depth e-tutorial)
- Databases & Online Searching
- Essay writing
- Google, Search Engines
- Reference interview / client communication
- Social Networking

Respondents’ proposals for new e-tutorials suggested a high level of enthusiasm for this mode of learning and indicated that they can see how and where e-tutorials can integrate with and support their learning.

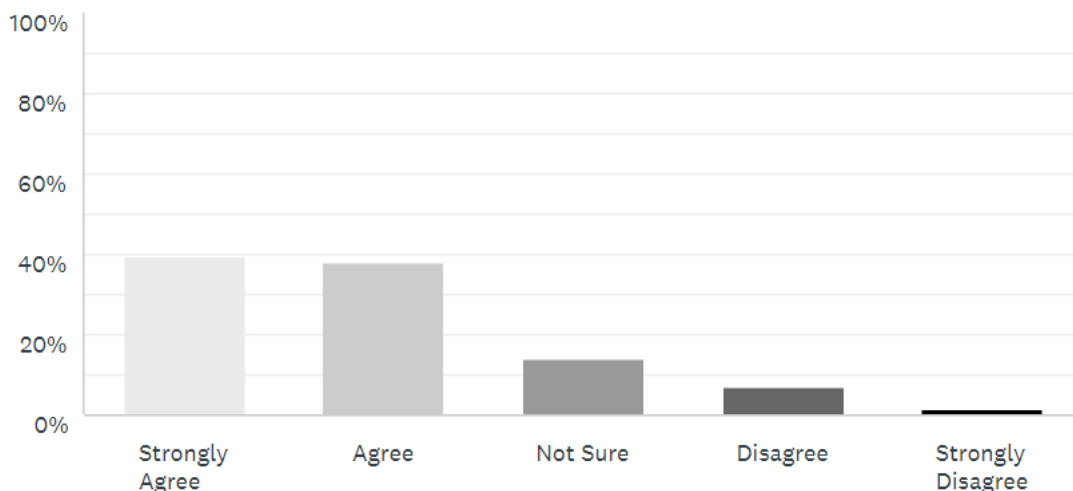


Figure 7. I would like other SILS modules to include e-tutorials

### ***PERCEIVED CHALLENGES***

One concern around the project was the potential for technological issues to disrupt student learning and detract from the overall blended learning experience. Students were asked if they had experienced any problems in completing the e-tutorials, as well as to outline the nature of these issues, if applicable. The majority of those who responded to this question (n=41, 72%) reported no problems. Of the remaining minority of respondents (n=16, 28%) who reported difficulties, these problems arose primarily from technical glitches; for example, videos failing to launch, browser incompatibility, sound quality, internet connection problems, and navigation issues:

*The quiz at the end is finicky and the videos did not open.*



*Sometimes, the slides got stuck when the videos ended and I had to start all over again to get to the next slide.*

*I had a really hard time opening and watching the videos.*

*On Safari [browser], I couldn't access the e-tutorial – I had to install Firefox. As mentioned before, the sound quality could be improved on.*

The potentially negative and frustrating effect of technical problems on student experience, despite a general satisfaction with the content and format of the e-tutorials, is a cause for concern; several of the issues appeared specific to individual students, and related to their own devices, the browsers they were using to access the e-tutorials, and the version of Flash on their computers, thus rendering a universal solution more challenging.

### ***PERCEPTIONS OF ONLINE LEARNING***

Students were asked a summary question about their preference for online learning versus face-to-face classroom learning. Three positions emerged. First, most respondents commented on the favorable aspects of online learning, including the benefits of working independently at one's own pace, the ability to repeat the e-tutorials multiple times if desired, as well as the highly interactive nature of the e-tutorial format:

*I personally prefer [the e-tutorial] as it is more interactive for the student.*

*Was beneficial, because you could go over it as many times as you wish. The quiz at the end made me learn more, because it had to be 100%.*

*I believe it compels the students to become more engage[d] and independent in their studies.*

Another set of comments emphasized the need for a blend of learning approaches. Respondents expressed a preference for retaining both formats in their courses (online and face-to-face), rather than one or the other:

*I feel that online learning is a chance to revise and deepen your understanding of what has been talked about in the lectures. It is great when combined with face-to-face lectures but would not work without face-to-face classes.*

*I enjoy online learning when used in conjunction with actual classroom learning. However, I would not like it to replace learning in the classroom completely.*

These respondents expressed an appreciation for active learning, as well as for complementary learning between online and in class learning, both of which seemed to work well for them.

Only one respondent chose classroom learning over online learning, explaining:

*I prefer learning in the classroom, because it is more personal, and I think I learn more from examples given in class.*

Students were asked for any final comments at the end of the survey. Respondents were enthusiastic, noting, for instance, that the e-tutorials offered a “*fun way to learn.*” Another respondent observed that the e-tutorials were a...

*Good idea that could be developed and good with some different ways of learning.*

Another respondent connected the e-tutorials with weekly lecture content:

*I found them easy to use and a great way to focus on the topic of each lecture on a weekly basis.*

Because living in Dublin is extremely expensive, students often live elsewhere in Ireland and commute significant distances to attend the university. E-tutorials were observed to ameliorate the commute:

*Being able to do an e-tutorial, instead of having to travel into college on a Friday morning for the lecture was a great bonus!*

Finally, one respondent observed the desirability of the e-tutorials in the university context today:

*Can we have more of them please? As part of the Google generation, I expect UCD to provide multimedia learning resources.*

## DISCUSSION

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### *ENGAGEMENT WITH E-TUTORIALS*

While students are often assumed to be digitally literate on entering higher education, exploring their engagement with the specific technologies supporting e-tutorial content provided useful insight to the issue of digital literacies. For instance, in this study, the majority of respondents rated their level of digital literacy highly as *good* to *excellent*, and they further identified a need for keeping up with technological change. However, despite the relatively high self-ratings for digital literacy, the majority of respondents stated that the e-tutorials were a new mode of learning for them. Those who did cite previous experience with online learning often noted that they had encountered other forms of e-lessons, e-tutorials, and e-learning in their academic and personal lives.

Survey respondents were positive about their experience of the e-tutorials, reflecting the positive student attitude toward e-learning observed by Ademole-Odeshi (2014). Most students found the content clear and relevant to their courses and could navigate the content with relative ease. Challenges reported appeared to relate almost entirely to technological glitches that prevented the e-tutorials from launching or running properly, rather than difficulty with the content or navigation. Given the respondents' views, students in this study seemed to have engaged successfully with the e-tutorials.

### *E-TUTORIALS AND BLENDED LEARNING*

The e-tutorials proved a successful addition to blended learning in the school, and they continue to be rolled out annually in the same courses where they are matched to and embedded with course content. Transferability of content has also been an important aspect of this project; where teaching staff have identified a need for particular skill development that is covered by an existing e-tutorial, it has been integrated into their courses, in keeping with Oliver and Herrington's (2001) framework for online learning design, and Biggs and Tang's (2007) concept of constructive alignment, to support student acquisition of the desired skills. The adoption of a uniform style in design and presentation, along the proposed guidelines of Blummer and Kritskaya (2009) and Plumb (2010), for example, has assisted in the general perception of the suite of e-tutorials as a unified package of learning content in the school, from which individual or multiple units of learning can be selected for targeted learning support. This strategy contributes significantly to increased adoption of blended learning across the school's program offerings.

Importantly, the survey revealed that several students felt that e-tutorials should not be used to replace face-to-face teaching. Rather, they viewed the e-tutorials to be best suited as supplementary or complementary units of learning to classroom instruction. This is similar to Johnston's study on the effectiveness of an online module for information literacy skill development; while her student participants generally enjoyed "the self-paced, flexible nature of online delivery," some of them "still felt that face-to-face instruction was beneficial as well" (2010, p. 217). Strategic placement of the e-tutorials within course content was effective in helping students to connect learning and course activities in this project. Students' perceptions of how to utilize e-tutorials in their learning is reflective of their recognition of their personal cognitive loads. In keeping with Oud (2009), the positioning of e-tutorial content is critical for maintaining appropriate cognitive load for students. In addition, Oud (2009) observed that control over activities has an impact on cognitive load. By giving students control over their completion of e-tutorials, students also had increased control over their cognitive loads. The positioning of e-tutorials at point-of-need learning, as promoted by Weeks and Putnam-Davis (2017) further facilitated student control over cognitive load.

### ***PERCEPTIONS OF LEARNING THROUGH E-TUTORIALS***

In this study, survey respondents perceived that the e-tutorials enhanced their learning and were relevant to course content. The e-tutorials proved useful for reinforcing classroom learning in the courses identified for blended learning, with the respondents identifying the relevance of the e-tutorials to material that had been covered in class. E-tutorials provided an inclusive learning environment, as described by Islam, Kunifuji, Hayama, and Miura (2011), enabling all students to acquire learners through flexible take up and completion, as well as repetition.

Respondents were satisfied with the amount of content in the e-tutorials. Importantly, they clearly related the e-tutorials to their courses. The development of e-tutorials in this project has shown the importance of pairing content with learning outcomes. As Oliver and Herrington (2001) have suggested, use of technology to create the online experience is secondary to the learning outcomes and tasks which form the online learning experience. It is essential that students understand the role of e-tutorials in their learning at course and program levels, so that they connect their learning through e-tutorials with their wider academic experience.

### ***E-TUTORIALS AS A DIGITAL MODE OF LEARNING***

There existed some overlap in terminologies used in education for students in this study. For instance, survey respondents sometimes used terms, such as online learning and e-tutorials, interchangeably. The use of different terms for various technologies suggests that the students may have sometimes seen a seamless continuum of digital opportunities and contexts. This perception of the digital learning context requires attention at the development stage of future e-tutorials.

### **LIMITATIONS AND EXPANDING THIS RESEARCH**

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While the researchers benefitted from the support of their school for the inclusion of e-tutorials in courses at undergraduate and postgraduate levels, technological issues might have been resolved more quickly with access to an educational technologist. Making sure the technology behind the e-tutorial works is a critical point; student confidence in a product, such as an e-tutorial, can easily be lost when there is a technological glitch. The school has now hired an educational technologist, and this has proven very helpful to instructors and students working with e-tutorials moving forward.

This project was exploratory in nature, with the aim of considering the utility of e-tutorials in blended learning environments from the student perspective. E-tutorials in our institution are currently developed on an *ad hoc* basis, that is, where an instructor has an interest in rolling out content in different ways and has access to tools, such as Articulate, to support e-tutorial development. Furthermore, training to use software tools has also been *ad hoc*, with individuals learning on their own and applying for short course training in the university when it is available. Increased institutional support for e-learning development is needed.

There is also a need for school and university level policies around e-tutorials as part of teaching and learning. An umbrella policy in the university is needed to support staff and to manage student expectations for their learning. In addition, coordination among colleges and schools would help develop uniform policy and implementation throughout the university.

This project has offered an initial exploration of the use of e-tutorials in blended learning. Additional research in this area is needed, that focuses on e-tutorial development across programs. Currently, the researchers are exploring the development of a new suite of e-tutorials for undergraduate students on topics related to digital research skills. The content will be reusable in other learning contexts, including other universities. The project is evolving, and the outcomes will develop over an extended period.

## CONCLUSIONS

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The aims of this project were threefold: to create and implement a suite of reusable interactive e-tutorials in undergraduate and postgraduate curricula; to evaluate our students' perceptions and experience of the e-tutorials; and to explore our students' general attitudes to online and blended learning. The e-tutorials were developed in line with best practice derived from a review of the relevant literature, with the aim of reducing pressure on cognitive load to support optimal engagement and learning (Oud, 2009; Scale et al, 2014). Based on Oliver & Herrington's framework for learning design (2001), they were embedded in the institutional VLE, and linked to face-to-face course content in a structured way at key points in the curriculum for each individual course.

Students' perceptions of the e-tutorials and online/blended learning were explored through the administration of a survey which incorporated quantitative and qualitative elements, with the aim of eliciting authentic insights into their experience. While much previous work in this area has focused on the impact of digital learning through examining direct academic attainment (Siemens, Gašević, & Dawson, 2015), this case study sought to incorporate the student voice and explore contextual factors which positively or negatively affected their engagement.

Supporting previous findings by Ademole-Odeshi (2014), this exploratory case study showed that the e-tutorials proved to be a positive addition to the students' learning experience overall, providing them with a novel learning opportunity in a different format to the traditional modes that are used in higher education. The e-tutorials had the effect of reinforcing face-to-face learning, by providing reusable learning objects that could be revisited at any time and completed at their own pace. Some technical issues proved disruptive; however, the overall student experience was positive, suggesting that the blended learning structure adopted for these courses was effective. This was in line with Johnston's (2010) research, where students also expressed a preference for blended learning, rather than online learning alone, suggesting that classroom or face-to-face learning is perceived by them as valuable in terms of their overall educational experience.

The development of e-tutorials in this project reinforced concepts of best practice around creating a positive online experience. Importantly, critical success factors identified by various researchers, e.g., Plumb, 2010, Blummer & Kritskaya, 2009) were incorporated into e-tutorials, including clear learning outcomes, collaboration on content and design, clear navigational design, length of e-tutorials, evaluation of learning, and consultation with students engaging with the e-tutorials. It is hoped that the findings of this study will contribute to the body of evidence on the effectiveness of digital learning modes for student engagement and learning and offer some useful insights into blended learning and e-tutorial development for educators in higher education.

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## APPENDIX

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### *SURVEY OF STUDENTS' EXPERIENCE OF E-TUTORIALS*

#### Section A - Personal Details

1. Please indicate your gender:

- a) Female
- b) Male

2. Which category below includes your age?

- a) 17-20
- b) 21-29
- c) 30-39
- d) 40-49
- e) 50-59
- f) 60 or older

3. What stage in your studies are you currently at?

- a) Stage One
- b) Stage Two - 2nd Year
- c) Stage Two - 3rd Year
- d) Postgraduate
- e) Other (please specify)

4. For each SILS module that you took this semester, please indicate if you chose this module as an elective, or as part of your degree program. Leave blank the module(s) that you did not take

1. Programme    2. Elective

- a) IS10050 Digital Judgement
- b) IS20010 Advanced Information Skills
- c) IS40530 Information & Reference Services
- d) Other (please specify)

5. How would you rate your own Digital Literacy?

- a) Excellent
- b) Very good
- c) Good
- d) Adequate
- e) Limited
- f) Poor
- g) Not sure

If you wish, please use the space below to expand on your answer:

6. Was this your first experience of online learning?

- a) Yes
- b) No
- c) Not sure

If you wish, please use the space below to expand on your answer:

7. If you answered "No" to Q. 6, can you briefly describe the types of online learning that you have experienced before?

### Section B - e-tutorials

8. "The e-tutorials were easy to find and access in Blackboard" (Please tick the appropriate option for each e-tutorial, leaving blank the e-tutorials that you did not complete)

Strongly Agree    Agree    Not Sure    Disagree    Strongly Disagree

- a) Advanced Searching Techniques
- b) APA Referencing
- c) Boolean Logic & basic search strategies
- d) Evaluating Digital Information
- e) How to Create a Wiki in Blackboard
- f) How to find an Article
- g) How to find a Book
- h) Using Catalogues
- i) How to find Factual Information
- j) Teamwork: How to Collaborate Effectively

If you wish, please use the space below to expand on your answer:

9. Please indicate, in terms of hours spent, approximately how long it took you to complete each of the e-tutorials, including viewing the videos, and completing any quizzes that were included

- a) Advanced Searching Techniques
- b) APA Referencing
- c) Boolean Logic & basic search strategies
- d) Evaluating Digital Information
- e) How to Create a Wiki in Blackboard
- f) How to find an Article
- g) How to find a Book
- h) Using Catalogues



- i) How to find Factual Information
- j) Teamwork: How to Collaborate Effectively

10. "The e-tutorials helped me to better understand the subjects they were about." Please indicate whether you agree with this statement

Strongly Agree    Agree    Not Sure    Disagree    Strongly Disagree

- a) Advanced Searching Techniques
- b) APA Referencing
- c) Boolean Logic & basic search strategies
- d) Evaluating Digital Information
- e) How to Create a Wiki in Blackboard
- f) How to find an Article
- g) How to find a Book
- h) Using Catalogues
- i) How to find Factual Information
- j) Teamwork: How to Collaborate Effectively

If you wish, please use the space below to expand on your answer:

11. "The e-tutorials were relevant to the content of the module." Please indicate whether you agree with this statement

Strongly Agree    Agree    Not Sure    Disagree    Strongly Disagree

- a) Advanced Searching Techniques
- b) APA Referencing
- c) Boolean Logic & basic search strategies
- d) Evaluating Digital Information
- e) How to Create a Wiki in Blackboard
- f) How to find an Article
- g) How to find a Book
- h) Using Catalogues
- i) How to find Factual Information
- j) Teamwork: How to Collaborate Effectively

If you wish, please use the space below to expand on your answer:

12. How would you rate the amount of information included in the e-tutorials?

Too Little    About Right    Too Much    Not Sure

- a) Advanced Searching Techniques
- b) APA Referencing
- c) Boolean Logic & basic search strategies
- d) Evaluating Digital Information
- e) How to Create a Wiki in Blackboard
- f) How to find an Article
- g) How to find a Book
- h) Using Catalogues
- i) How to find Factual Information
- j) Teamwork: How to Collaborate Effectively

If you wish, please use the space below to expand on your answer:

13. How would you rate the clarity and layout of information on the slides in the e-tutorials?

Not Clear      Mostly Clear      Very Clear      Not Sure

- a) Advanced Searching Techniques
- b) APA Referencing
- c) Boolean Logic & basic search strategies
- d) Evaluating Digital Information
- e) How to Create a Wiki in Blackboard
- f) How to find an Article
- g) How to find a Book
- h) Using Catalogues
- i) How to find Factual Information
- j) Teamwork: How to Collaborate Effectively

If you wish, please use the space below to expand on your answer:

14. How would you rate the ease-of-use and navigation of the slides in the e-tutorials?

Not Easy to Use      Some Problems      Easy to Use      Not Sure

- a) Advanced Searching Techniques
- b) APA Referencing
- c) Boolean Logic & basic search strategies
- d) Evaluating Digital Information
- e) How to Create a Wiki in Blackboard
- f) How to find an Article
- g) How to find a Book
- h) Using Catalogues
- i) How to find Factual Information
- j) Teamwork: How to Collaborate Effectively

If you wish, please use the space below to expand on your answer:

15. How would you rate the quality of the videos included in the e-tutorials?

Excellent quality      Good quality      Below average quality      Poor quality

- a) Advanced Searching Techniques
- b) APA Referencing
- c) Boolean Logic & basic search strategies
- d) Evaluating Digital Information
- e) How to Create a Wiki in Blackboard
- f) How to find an Article
- g) How to find a Book
- h) Using Catalogues
- i) How to find Factual Information
- j) Teamwork: How to Collaborate Effectively

If you wish, please use the space below to expand on your answer:

16. How would you rate the level of difficulty of the e-tutorials?

Too Difficult      About Right      Too Easy      Not Sure

- a) Advanced Searching Techniques
- b) APA Referencing
- c) Boolean Logic & basic search strategies

- d) Evaluating Digital Information
- e) How to Create a Wiki in Blackboard
- f) How to find an Article
- g) How to find a Book
- h) Using Catalogues
- i) How to find Factual Information
- j) Teamwork: How to Collaborate Effectively

If you wish, please use the space below to expand on your answer:

17. "I would like other School of Information & Library Studies modules to include e-tutorials."  
Please indicate whether you agree with this statement:

- a) Strongly Agree
- b) Agree
- c) Not Sure
- d) Disagree
- e) Strongly Disagree

18. If you could choose a new e-tutorial to add to our current list, what topic would you most like to see covered?

19. "I enjoyed working on the e-tutorials." Please indicate whether you agree with this statement

- a) Strongly Agree
- b) Agree
- c) Not Sure
- d) Disagree
- e) Strongly Disagree

If you wish, please use the space below to expand on your answer:

20. "The e-tutorials enhanced my learning within my program of study" Please indicate whether you agree with this statement

- a) Strongly Agree
- b) Agree
- c) Not Sure
- d) Disagree
- e) Strongly Disagree

If you agree with the statement, please use the space below to describe how you feel your learning was enhanced

21. Did you experience any problems with the e-tutorials?

- a) Yes
- b) No

If yes, please explain.

22. Overall, how do you believe online learning compares to learning in the classroom?

23. Please add any further comments that you would like to make about the e-tutorials

## BIOGRAPHIES

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**Dr Claire McGuinness** is Assistant Professor, Deputy Head of School and Director of Undergraduate Programmes in the School of Information and Communication Studies, UCD, Ireland, where she received her PhD in Library & Information Studies in 2005. A specialist in information and digital literacy, information work, and instructional theory and practice, Claire has published widely on information and digital literacy, information professionals as teachers, professional identity, and academic-librarian collaboration; her first book, *Becoming Confident Teachers: A Guide for Academic Librarians*, was published in 2011, and her most recent book from Chandos Publishing, which was written in collaboration with Dr. Crystal Fulton, *Digital Detectives: Solving Information Dilemmas in an Online World*, was published in March 2016. Claire has extensive experience in working with undergraduate and postgraduate students and has designed

and taught multiple information & digital literacy modules over the past two decades, using a range of face-to-face, online and blended learning modes.



**Dr Crystal Fulton** is an Associate Professor at University College Dublin, Ireland, where she studies the social interactions among people, information, and communication in daily life settings. Her research into the information worlds of people engaged in serious leisure (e.g., genealogists, urban explorers, gamblers) examines leisure participation and the connections among hobbies, behaviors around information supporting hobby activities, and impact on individuals, groups, and communities. In particular, her work extends beyond issues of information acquisition to investigate how information is used, shared or hidden, and created in both digital and non-digital environments. She recently co-authored *Digital Detectives* (Chandos, 2016) with Dr Claire McGuinness, a monograph which explores digital competencies around information acquisition, evaluation, and use. Dr Fulton is currently a Teaching Fellow at UCD,

for which she is examining potential uses of the university's new learning management system, Brightspace, for both students and teaching staff.