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Author(s)	Dempsey, Mary;Brennan, Attracta;O'Dea, Majella
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# RE-BOOT LEARNING: PROVIDING AN E-TIVITY SCAFFOLD FOR ENGAGEMENT FOR EARLY RESEARCH ACTIVITY THROUGH BLOG TECHNOLOGY EMBEDDED WITHIN TEACHING AND LEARNING

M. Dempsey<sup>1</sup>, A. Brennan<sup>1</sup>, M. O’Dea<sup>1</sup>

<sup>1</sup>NUI Galway (IRELAND)

## Abstract

Increasing student numbers in higher education over the last decade has challenged educational environments [1] and prompted educators to re-think learning environments and delivery methods such that a student-educator partnership approach is adopted [2]. Such a partnership approach can result in deep-learning and debate rather than the delivery of a service, thereby invalidating the viewpoint that a degree is a commodity rather than a skills-set. The Community of Inquiry framework draws upon ideas that computer-mediated teaching and learning require the existence of three interdependent presences (social, teaching and cognitive) [3]. However, the inclusion of technology in pedagogy can further complicate teaching and learning. Given that digital technologies are ever-changing, not always predictable, and can take on many forms supports the view that both developers and end-users of digital technologies do not always know nor can they always predict trends and applications of said technologies [4]. *“Efforts to guide educators and researchers in their technology integration has resulted in developed standards, frameworks, models, and theories that may be used to inform research and practice”*. As an example, the International Society for Technology in Education (ISTE) (2015) standards have been developed *“to support students/educators/leaders with guidelines for the skills, knowledge and approaches they need to succeed in the digital age”* thereby addressing how learners can benefit from the effective use of technology [5] [6]. The use of frameworks (such as Technology, Pedagogy, and Content Knowledge (TPACK)) facilitates the integration and effectiveness of technology in teaching and student engagement [7].

The authors assert that the use of an e-tivity (i.e. a framework which supports active and interactive online learning), based on the TPACK framework, which structures research based student learning activities can act as a scaffold to encourage students to spend enriched learning time in the liminal space in the mastery of the related threshold concept (how to engage in early research activity related to the module content). In this paper, the authors present this e-tivity scaffold. In order to assess its effectiveness, 93 Postgraduate and Undergraduate students are surveyed.

Keywords: Liminal space, research blog, digital technology, TPACK, threshold concept, community of inquiry, e-tivity, activity based practice, digital continuum, research-led teaching.

## 1 INTRODUCTION

Student disengagement is a reality and is defined *“as a multi-faceted, complex yet fluid state, which has a combination of behavioral, emotional and cognitive domains”* [8]. A number of factors, both intrinsic (e.g. psychological issues, low motivation, inadequate preparation for tertiary study and unmet/unrealistic expectations) and extrinsic (e.g. competing demands/financial stress, institutional structures and processes, academic staff factors and online teaching and learning) to the student, were identified by Chipchase et al. (2017) as influencing disengagement [8]. The authors contend that some of the negative influencers for disengagement can be flipped into positive engagement influencers through the use of digital learning platforms to provide impactful learner supports/scaffolds. As the accessibility and usability of Web 2.0 technology tools are more prominent than a decade ago, many of today’s students engage in learning as digital natives [9]. Based on their use of technology, they are positioned on the digital continuum of either ‘Visitors’ (i.e. infrequent users of technology) or ‘Residents’ (i.e. users who are very reliant on technology). This emerging metaphor of ‘place’ and ‘tool’ represents the use of social technologies in contemporary society [10]. A sense of ‘place’ is noted when users navigate platforms and interact with other users (similar to movement in the physical place and arrangements for travel therein). Clearly, the more time spent in ‘place’ and the more frequent use of ‘tools’ influences the shift of status from ‘visitor’ to ‘resident’. It also leverages ‘place’ to act as a

technology enabler and diverter of technology fears, by creating threshold concepts which are more comfortable and natural to achieve [10]. The end result is a simpler learning process associated with new technologies which enables users to develop a set of transferable skills across a range of platforms. To facilitate this skill development and learning, Hamilton (2016) identified the need *“to support students, educators and leaders with clear guidelines for the skills, knowledge and approaches they need to succeed in the digital age”* [4]. As digital technologies are ever-changing, not always predictable, and can take on many forms [5], the inclusion of technology in pedagogy can increase the complexity of teaching and learning [4]. *“Efforts to guide educators and researchers in their technology integration has resulted in developed standards, frameworks, models, and theories that may be used to inform research and practice”*. The Technology, Pedagogy, and Content Knowledge (TPACK) framework is one such framework which facilitates the integration and effectiveness of technology in teaching and student engagement [6]. However, the use of digital technology in the classroom can result in students falling into a passive role focussing more on the technology than the learning, thereby leaving the educators bearing the responsibility for the students’ learning [2]. Pragmatically speaking, embedded technology teaching has many challenges but these can be overcome with educators and students working in partnership with a common focus [11]. In effectively embedding appropriate technology, Garrison et al. (1999) recommends an e-tivity tool which represents *“a framework for active and interactive online learning”* [9]. This can foster greater learner engagement by creating formal and informal settings to allow more opportunities for dialog. Embedded technology in teaching has many challenges but these challenges can be overcome with educators and students working in partnership with a common focus.

In this paper, the authors assert that the use of an e-tivity scaffold which supports active and interactive online learning and which is based on the TPACK framework, can encourage students to spend enriched learning time in the liminal space. A liminal space is defined as the learning journey in the process of mastering a threshold concept (and thereby learning) [12]. Within the context of this study, the main threshold concept related to how to engage in early research activity related to the Lean Systems module.

## 2 METHODOLOGY

The e-tivity scaffold based on the TPACK framework (Fig. 1) involved:

1. Technology – A technological space (i.e. a Blog space) was created within the institutional VLE to provide an opportunity for students to collect research articles and comment on their own and their peers’ research articles. The purpose of the Blog activity was to encourage and foster engagement in both formal and informal settings in order to allow more opportunities for online dialog, thereby positively impacting learner engagement [12]. Furthermore, the Blog activity was established to engage and challenge students to actively participate in teaching and learning activities with the goal of in-depth learning.

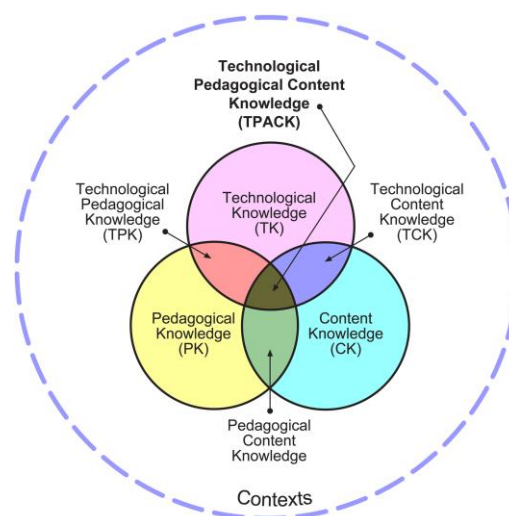


Figure 1 : The TPACK framework [3]

2. Pedagogy – The pedagogy underpinning the e-tivity scaffold was influenced by the Community of Inquiry (CoI) framework (Fig. 2) which draws upon ideas that computer-mediated teaching and learning require the existence of three interdependent presences (social, teaching and cognitive). In the e-tivity scaffold, students socially interacted on line to “collaboratively engage in purposeful critical discourse and reflection to construct personal meaning and confirm mutual understanding” [12]. With regard to the teaching and cognitive presences, the instructor facilitated and directed the students so that they had a deeper and more meaningful understanding of the learning outcomes. Because of the integration between social, teaching and cognitive presences, a greater educational experience was achieved. It is the purpose of this study to evaluate the effectiveness of this experience.

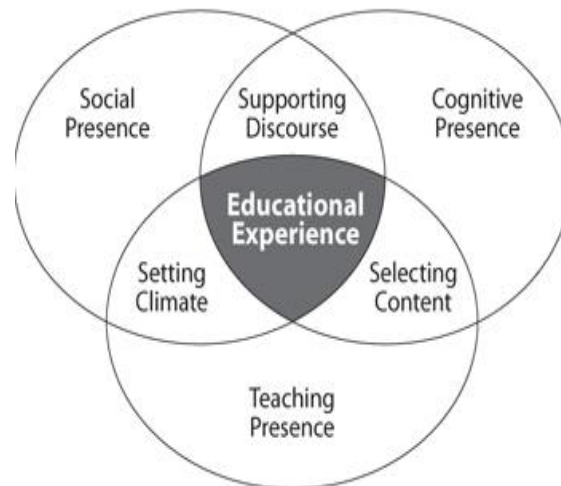


Figure 2 : The CoI Framework [12]

3. Content - In establishing the e-tivity scaffold for engagement, students were required to partake in a Lean Systems exercise where they each researched a case study of how Lean Systems failed and caused a detrimental impact on humans. After researching relevant case studies, students individually made a 60 second summary pitch to their peers to share what they had learned. In order to capture the richness of this activity, students were requested to populate the technological space with a research paper and comment on the key messages emanating from their chosen paper. The purpose of the research activity was to learn from failure and understand the possible root causes of such failures.

In order to assess the effectiveness of the e-tivity scaffold to encourage students to spend enriched learning time in the liminal space, regardless of place on the digital continuum, 93 Postgraduate and Undergraduate students were surveyed. Comprising 28 questions, the aims of this survey were to:

- a) determine the impact an informal technological space, such as a Blog, had on the students' research activity,
- b) elicit whether or not classroom based learning through discussion was supported by the online Blog and
- c) assess whether or not the Blog met the students' expectations and facilitated them in easing their transition through liminal spaces in the mastery of the related threshold concept.

Anecdotal comments from the students will also be used to relate aspects of their journey through the liminal space.

## 2.1 An e-tivity scaffold for engagement

An e-tivity represents “a framework for active and interactive online learning” [9]. The planning for the e-tivity for early research activity through blog technology is shown in Table 1. Particular attention was paid to providing students with instructions on how to interact with both the content and each other in the online learning environment.

Table 1: e-tivity planning

<b>Research Blog e-tivity</b>	
Purpose	The learning objectives for the Research Blog e-tivity are to <ul style="list-style-type: none"> <li>• Enrich learning through a research activity</li> <li>• Enhance engineering students' communication skills</li> <li>• Increase student confidence</li> <li>• Facilitate a two-way class discussion</li> </ul>
Number of participants	93
Total time (for whole activity in days)	4 hours
Topics/Tasks being addressed (e.g. threads – list titles to be used)	<ul style="list-style-type: none"> <li>• Student-driven research into the “dark” side of Lean Systems which resulted in the detriment of human life.</li> <li>• In-class oral presentation (60 seconds/student).</li> <li>• Summary via Blackboard in a short Blog (2 sentences minimum) together with the citation and/or link.</li> </ul>
E-moderator's time commitment	10 minutes/day
Participant time requirement	2 hours
E-moderator actions (strategies/interactions)	Praise loudly and criticise very softly Encourage, encourage, encourage.
Participant actions needed (expectations)	Research activity to find an interesting case study or article on how Lean Systems can have a detrimental impact on humans. <ul style="list-style-type: none"> <li>• In class 60 second short in class presentation</li> <li>• Contribution to class discussion</li> <li>• Blog summary via Blackboard</li> </ul>
Evaluation	Students do not lose marks in engaged. 10% loss of marks if students do not engage.

\*NOTE: Time commitment should be set out before the actions since the time available will limit what can practically be achieved. Adapted from Salmon (2005) [9]

### 3 RESULTS

The survey was deployed to 93 students of which 59 responded (63%). 80% of the respondents were male and 20% were female. The majority of the respondents were in the 18-22 age bracket (54%) with 39% aged between 23 and 27 and 7% aged 28 years or more. 69% of the respondents had used Blogs prior to the study. The results are presented thematically based on the research questions.

**Research question 1:** What was the impact of this technological space (i.e. the Blog) on the students' research activity?

The respondents agreed that the Blogs were rich in content (69%), the discussion based on the research activity was task orientated (82%) and the identification of research sources through class Blogs was easy (72%). They also highlighted that the Blogs of their classmates were inspiring (73%) and that the use of Blogs had given them impetus for advancing their own research (64%). 76% said that Blogs were a suitable research scaffold. The respondents also contributed reflective comments on the impact of this technological space on their research (Table 2). In summary, the ability to read and comment on their classmates' research in addition to having their peers comment on their own work, fostered a community of inquiry where the students as collaborators engaged "in purposeful critical discourse and reflection to construct personal meaning and confirm mutual understanding" [9].

Table 2: Reflective comments from the respondents on the impact of this technological space on their research

Research Blog e-tivity	
[Student 8]	'It allows everyone's research to be stored and presented so that people can learn from them throughout the semester and not just in a one off presentation environment'
[Student 23]	'Found the blogs helped with my own research'
[Student 27]	'It can be a base for research topics, not detailed summaries but general ideas'
[Student 35]	'It was an easy way to upload and read others research in your own time'
[Student 53]	'I think research blog should content more current issues' (sic)

**Research question 2:** Was classroom based learning through discussion supported by the online Blog?

While not all respondents agreed that Blogs demonstrated teamwork (52%), a high percentage agreed that Blogs could be useful in a work environment (74%). Just over half (51%) agreed that through the use of Blogs, their learning was more focused compared to teamwork sessions. However, 72% of the respondents indicated that they had learned a significant amount about Lean Systems and how these systems failed, through reading their classmates' postings. 69% assessed the use of Blogs in learning as influential. 52% of respondents agreed that Blogs were fun, while 72% asserted that communication within the class ranged from good to excellent. In-class discussions support students in developing skills for collaboration and communication whilst also encouraging them to "explore, develop, synthesize, and evaluate scientific ideas" [13]. The respondents also contributed reflective comments on how classroom based learning through discussion was supported by the online Blog (Table 3).

Table 3: Reflective comments from the respondents on how classroom based learning through discussion was supported by the online Blog

Research Blog e-tivity	
[Student 27]	'Brainstorming leads to cultivate many great ideas! Blogging offers same response'
[Student 28]	'Reading the blogs each week became a huge drain on class time which I did not like'
[Student 34]	'That is not easy to use in mobile phones, and you can't edit or delete your previous information after you submit it'
[Student 44]	'I found it hard to gain access to the blog at various times throughout the semester. I feel the blog is an excellent way to keep track of the research conducted by the class in an open form that is easy to access - but it should not be so frustrating to view the blog on blackboard'
[Student 35]	'Course was relatively interesting, lecturer was engaging with the class which was a nice change'
[Student 39]	'I don't understand the purpose of them. I feel the lecturer should have selected the best examples from the blogs to publish on blackboard. As it stands there are too many blogs and I feel it's daunting to go to every single one to select the good ones. A more organised approach to presenting the lean system failures should be implemented. I noticed people often felt annoyed that others would jump ahead of them when they were about to present. A rigid timetable would be more efficient'
[Student 55]	'Blogging should be made a part of every coursework'

**Research question 3:** Did the use of the blogging activity meet the students' expectations and facilitate them in easing their transition through liminal spaces in the mastery of the related threshold concept?

While 31% of the respondents had not used Blogs previously, 77% found the Blog easy to use. 76% of the respondents agreed that it was easy to impart knowledge using the Blog, while 78% contended that it was useful to Blog and then read other Blog postings. The generally positive interaction with their peers through easy to use blogs imparted a sense of 'place' to the students and for some, shifted their status from 'visitor' to 'resident'. 70% of respondents stated that their confidence in and understanding of the module content increased significantly as they read the Blogs of their peers. 62% were satisfied with the Blog activity and indicated that it met their expectations. 64% felt relaxed about contributing their ideas in a Blog. The majority (67%) felt that their learning through Blogs ranged from good to excellent. Prior to entering the liminal space, the instructor created a portal via the e-tivity and encouraged students to enter this liminal space. Once inside, the students accepted a transformation of their own understanding [14] as they attained the threshold concept of how to engage in early research activity related to the Lean Systems module. This is evidenced by both the survey results and the reflective commentary in Table 4.

Table 4: Reflective comments from the respondents about blogging as a research activity

Research Blog e-tivity	
[Student 23]	'Found reading other blogs extremely helpful with my understanding of lean systems and their failures'
[Student 26]	'Easy to use, quick to pick up content from others and easier to remember for exams etc. due to the content being visible online'
[Student 35]	'Blog was easy to use, and many people engaged in it well'
[Student 40]	'Useless, less communication over the blog, more interactive blog'
[Student 44]	Great class Mary - thanks for facilitating our learning in such an open and nice environment
[Student 47]	'Blogs were very useful and helped us for easy access to lean failures'
[Student 53]	'It is very good also we learn through activity'
[Student 55]	'It is extremely helpful and I rely on it from time to time'

## 4 CONCLUSIONS

An analysis of students' responses indicated that an e-tivity scaffold to support active and interactive online learning (based on the TPACK framework) can encourage students to spend enriched learning time in the liminal space, in mastering the main threshold concept of this study which is how to engage in early research activity related to the Lean Systems module.

The results show that the technological space of the e-tivity scaffold (i.e. Blog) impacted positively on students' research activity and resulted in greater engagement from the students who are highly motivated both inside the classroom and on-line. This study of 59 students showed that students built confidence in understanding the module content as they read the Blogs of their peers (70%), they were satisfied with the Blog activity (62%) and felt relaxed about contributing their ideas in a Blog (64%). The majority felt that learning through Blogs ranged from good to excellent (67%). Meanwhile, 78% of respondents found the use of Blogs for teaching and learning enhanced their learning. The results suggest that appropriate use of technology in teaching for the purpose of engagement and learning can act as scaffolds for deeper research activity and can encourage students to spend quality time in the liminal space in the mastery of threshold concepts.

In this study, respondents highlighted that their classmates Blogs were inspiring (73%), Blogs had given them impetus for advancing their own research (64%), Blogs were a suitable research scaffold (76%) and Blogs can be useful in a work environment (74%) thus enabling learners to develop a set of transferable skills across a range of platforms.

The Blogs also met students' expectations and eased their transition through the liminal space. The results also show a deeper student understanding of the module content through the research activity and its relevancy to real-life Lean Systems scenarios. Re-thinking learning environments and delivery methods can result in deep-learning and debate rather than the delivery of a service [2]. Careful integration of a e-tivity scaffold-holding technological space in teaching and learning can encourage and foster engagement in both formal and informal settings to allow more opportunities for dialog. This in turn can result in greater learner engagement and mastery of threshold concepts.

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