

# ***Moodle and Social Constructivism: Is Moodle Being Used as Constructed? A Case Study Analysis of Moodle Use in Teaching and Learning in an Irish Higher Educational Institute***

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## **Abstract**

Moodle was originally developed by Dougiamas in 2002 to help educators create an online teaching and learning platform that embodies a social constructivist pedagogical framework. Galway Mayo Institute of Technology (GMIT), an Irish higher educational institute, began using Moodle in 2006 but very little research has been carried out on whether Moodle facilitates social constructivism in practice in GMIT. The main research question for this study is to explore if engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree. The paper begins with a literature review which considers theoretical perspectives on social constructivism. It abstracts four principles from the overall theoretical framework to support a methodological basis to gauge what is occurring in Moodle in this GMIT business degree from a social constructivist perspective. These key principles include scaffolding, knowledge construction, active learning and social interaction and shows that Moodle can facilitate such principles in theory. The research strategy was a case study using a mixed methods approach. The data collection instruments include surveys and focus groups with final year business students and lecturers. The main finding that emerged from the study is that Moodle does not facilitate social constructivism principles in this group to any great extent. However, the study found that Moodle does facilitate limited scaffolding and in particular, conceptual scaffolding. In addition, a number of barriers were identified to using Moodle to facilitate social constructivism principles. These include a lack of training and time, availability of alternative technologies, more effective face to face social interaction and student inhibitions. The study concludes by offering some recommendations on how GMIT's School of Business might move closer to a position that harnesses Moodle's potential to facilitate the social constructivism

principles which underpin it. These recommendations are categorised under cultural, technical and policy enablers.

**Keywords:** active learning, knowledge construction, Moodle, social constructivism, virtual learning environments.

# 1. Introduction.

Moodle (Modular Object Orientated Dynamic Learning Environment) was originally developed by Martin Dougiamas to help educators create an online teaching and learning platform which is underpinned by a social constructivist pedagogical framework (Helling & Petter, 2012). Moodle was first released to the public in August of 2002. Galway Mayo Institute of Technology (GMIT), an Irish higher educational institute, began using Moodle in 2006 but very little research has been carried out on whether it facilitates social constructivism in practice in GMIT. The main research question for this study is to explore if engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree.

## 1.1. Literature analysis.

The aim of this section is to consider the key principles from the overall social constructivist theoretical framework and to identify if Moodle can theoretically facilitate these principles. Constructivism is a learning theory which posits that learning is a process of constructing meaning from our own experiences (Amineh & Asl, 2015). The main theorist associated with constructivism are Bruner (1915–2016) and Piaget (1896-1980) (Alanazi, 2016, p.1). Social constructivism augments constructivism by emphasising the importance of culture and context in understanding what occurs in society and constructing knowledge based on this understanding (Kim, 2001). Vygotsky (1896–1934) is the main theorist among social constructivists (Amineh & Asl, 2015, p. 13) and he considered that “*all higher functions originate as actual relations between human individuals*” (Vygotsky, 1978, p.57). While there may be a lack of consensus about the term social constructivism as well as its theoretical bases and assumptions (Bozkurt, 2017), this section seeks to present the theory by dividing it into four key principles, knowledge construction, active learning, social interaction and scaffolding and considers whether Moodle can pedagogically facilitate these principles.

### 1.1.1 Knowledge construction

Pedagogically, Cole (2009, p. 142) suggests that “*people learn best by actively constructing their own learning: students are presented with opportunities to build on prior knowledge and understanding in order to construct new knowledge and understanding*”. Amineh and Asl, (2015) suggest that teachers should consider what students know and allow their students to put their knowledge into practice. Dougiamas (1998) interprets knowledge construction as students coming to class with an established world-view, formed by years of prior experience and learning and that even as it evolves, a student’s world-view filters all experiences and affects their interpretation of observations. Table 1 (overleaf) shows some functions in Moodle that can facilitate knowledge construction, for example, wikis can be used for student projects to collaborate on ideas or blogs can be used to develop peer networks to develop learner knowledge (Grosseck, 2009).

### 1.1.2 Active learning

A key tenet of social constructivism is that people learn best by actively constructing their own learning (Cole, 2009; Harkness, 2009). For example, Dewey (1938, p.192) believed that learning was an active process and believed that the “pupil have a genuine situation of experience” and that “he has opportunity and occasion to test his ideas by application”. Piaget’s paradigm also argued that active learning was the best way to facilitate learning (Kafai & Resnick, 1996; Kivunja, 2014; McLeod, 2015). Bruner (1978) rejected the notion that students are passive rote learners of knowledge but that learners should be active constructive learners. Pedagogically, Cole (2009, p. 142) asserts that for social constructivism as a model of learning to be successful, it requires learner-centred instruction: “*educational materials need to be provided that helps the student to discover things for themselves rather than via passive tuition*”. Table 1 shows some functions in Moodle that can facilitate active learning, for example, the roles implementation allows teachers to create new roles where students can be allowed to facilitate forums, create quiz questions or even control the course layout (Dougiamas, 2013).

### 1.1.3 Social interaction

Social constructivists argue that meaningful learning occurs when individuals are engaged in social activities such as interaction and collaboration (Ally, 2008; McKinley, 2015). For example,

Dewey believed that “*education is essentially a social process*” (Dewey, 1938, p.25).

Table 1: Moodle functions facilitating social constructivism principles (adapted from Dougiamas (2013)).

| Social constructivism principle | Lecturers used function facilitating social constructivism principle very often or often in fourth year of GMIT business degree  |
|---------------------------------|--|
| Knowledge construction:         | Passive unfaciltated forum<br>Active and guided forum<br>Provide feedback on uploaded assignments<br>Wikis   |
| Active learning:                | Active and guided forum<br>Quizzes<br>Feedback on uploaded assignments<br>Wikis<br>Databases<br>Glossaries<br>Roles implementation   |
| Social interaction:             | Message students<br>Upload notes and readings<br>Wikis<br>Glossaries<br>Databases<br>Workshop (peer-review function)<br>Active and guided forum  |
| Scaffolding:                    | Communicate course structure and administration<br>Communicate module learning outcomes<br>Communicate important module topics<br>Download class material<br>Badges<br>Conditionality<br>Rubrics<br>Active and guided forum<br>Provide feedback on uploaded assignments<br>Workshop (peer review function) |

Vygotsky (1978) elevated social interaction in learning over individual cognitive learning and considered that much important learning by the student occurs through social interaction with

their teacher and with their peers (Wertsch, 2009, Trif, 2015). Pedagogically, Dougiamas (2013) proposes that we learn particularly well from the act of creating something for others to see and that we learn much by just observing the activity of our peers. Table 1 shows some functions in Moodle that can facilitate social interaction, for example, forums provide spaces for discussion and sharing of media and documents (Grosseck, 2009).

#### 1.1.4 Scaffolding

Scaffolding is a concept that is closely aligned with social interaction in the theory of social constructivism. The concept is most often associated with Bruner (1978) who stressed the '*inherently social nature*' of learning and considered the role of scaffolding in the context of a mother teaching a child language.

*'Scaffolding...reduces the degrees of freedom with which the child has to cope, concentrates his attention into a manageable domain, and provides models of the expected dialogue from which he can extract selectively what he needs for fulfilling his role in discourse.'* (Bruner, 1978, p.244).

Pedagogically, scaffolding occurs when the lecturer provides student assistance to the extent that the scaffolded individual can do the task in hand by himself (Amerian et al, 2014, p. 757). Jumaat and Tasir (2014, p. 75-76) extract this concept of scaffolding to an online environment and identify four progressive levels of scaffolding that can be used. These are outlined in Table 2.

Table 1 shows some Moodle functions that scaffold learning. For example, the lecturer can use the course structure page to outline the module journey or use conditionality whereby students are only exposed to further information once a task has been completed. Moodle can, therefore, facilitate social constructivism principles in theory. This paper explores how engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree in practice. The next section describes the research methods and procedures used to try to answer this research question.

Table 2: Levels of scaffolding (adapted from Jumaat &amp; Tasir (2014))

|                            |   |
|----------------------------|---|
| Conceptual scaffolding:    | Helps students decide what to consider in learning and guide them to key concepts   |
| Procedural scaffolding:    | Helps students use appropriate tools and resources effectively  |
| Strategic scaffolding:     | Helps students find alternative strategies and methods to solve complex problems  |
| Metacognitive scaffolding: | Prompts students to think about what they are learning throughout the process and assists students reflecting on what they have learnt (self-assessment). |

## 2. Research Methods and Procedures.

The research strategy chosen for this study was a case study using a mixed methods approach. While this mixed methods case study approach seeks to address the research question, it is not purported to be generalisable to other VLEs or outside of final year business students in GMIT. The case study approach does, however, offer useful conceptual insights and in depth understanding (Patton, 2002; Freeman, 2006) and provides analytical rather than statistical generalisation (Cohen, Mannion & Morrison, 2011, p. 294).

### 2.1 Site and participants.

The site chosen was the final year of a business degree in GMIT as GMIT adopted Moodle in 2006 and all final year modules are delivered using Moodle. The participants include students and lecturers in the final year of a GMIT business degree. The final year of the programme was chosen as social constructivism generally facilitates higher order thinking such as knowledge construction (Amineh & Asl, 2015, p.14) which is more likely to be evident in the later stages of a programme.

The sampling procedure for both quantitative and qualitative data collection was purposeful stratified sampling. It is purposeful in that it selects participants with knowledge and experience with Moodle. It is stratified in that both lecturers and students were surveyed to see how engagement with Moodle facilitates social constructivism principles from both perspectives. The data was collected on a cross-sectional basis.

## 2.2 Instrument design

Student and lecturer surveys were used to collect quantitative data and focus groups were used to collect qualitative data.

### 2.2.1 Quantitative data: surveys

The questions used a Likert scale where participants were asked to agree or disagree with a statement which varies from 'strongly agree' to 'strongly disagree' or to rate how often they used a particular Moodle function with choices varying from 'often' to 'never'. Ordinal responses were scored using the scale (0= Strongly Disagree) to (5= Strongly Agree) and (Never = 0 to Often=5). Appendix 1 (available in Supplementary Material) shows the student survey and appendix 2 shows the lecturer survey.

The survey was carried out online and students and lecturers were emailed the information leaflet and the survey link in December 2017. Table 3 shows the numbers of students and lecturers who were invited and who participated. In summary, 63% of final year students (n=84) and 75% of lecturers (n=15) volunteered to participate in the survey. Overall, there was a good gender balance in both cohorts, with approximately 50% of respondents being male and 50% being female.

Table 3: Number of student and lecturer participants in the survey

| GMIT Site           | Invited | Participants | Percentage taking part |
|---------------------|---------|--------------|------------------------|
| Final year students | 134     | 84           | 63%                    |
| Lecturers           | 20      | 15           | 75%                    |

### 2.2.2 Qualitative data: focus groups.

In general, the focus groups were based around the four themes of knowledge construction, active learning, social interaction and scaffolding discussed earlier. In particular, the focus groups sought to explain and explore the survey results around these themes. The quantitative results highlighted a number of areas that needed further explanation and these questions informed the themes for the student and lecturer focus groups. The focus groups for both students and lecturers took place in January 2018. About 20% of the student and lecturer group were invited to take part in focus groups (students n=27 and lecturers, n=5) and 7 students and 5 lecturers agreed to participate.

## 3. Findings.

This section gives a summary of some of the results from the quantitative and qualitative findings.

### 3.1 Quantitative results based on surveys.

The results show that Moodle does facilitate conceptual scaffolding. For example, Figure 1 and 2 show conceptual scaffolding is present from a student and lecturer perspective respectively. However, procedural, strategic or metacognitive scaffolding were less evident.

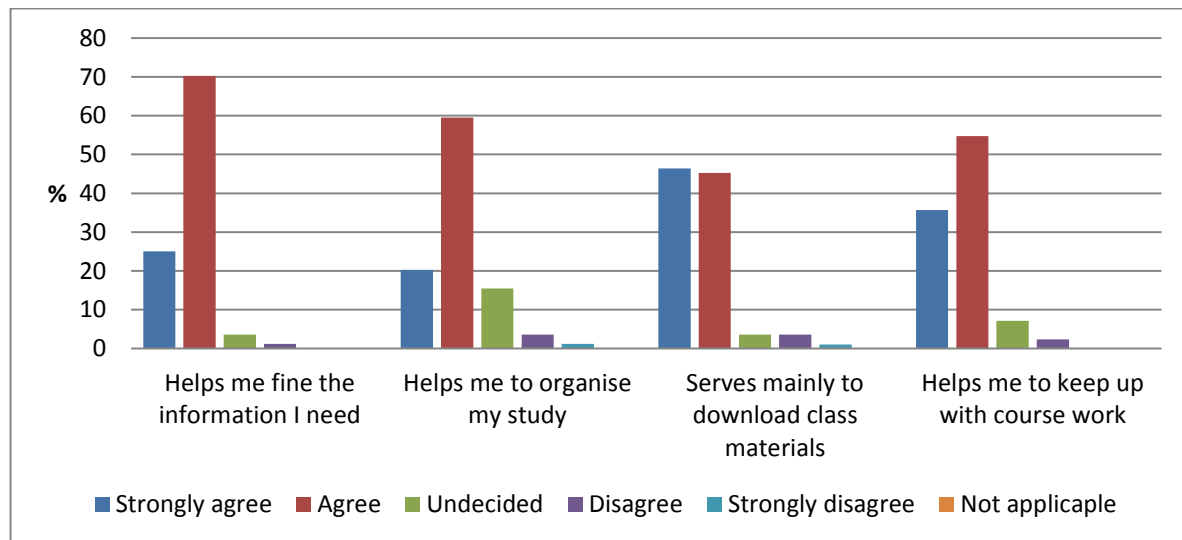


Figure 1: Conceptual scaffolding: Student perspective

However, the results also suggest that engagement with Moodle does not facilitate the other social constructivism principles of knowledge construction, active learning and social interaction. For example, Figure 3 and Figure 4 show social interaction is not present to any great extent from a student and lecturer perspective respectively.



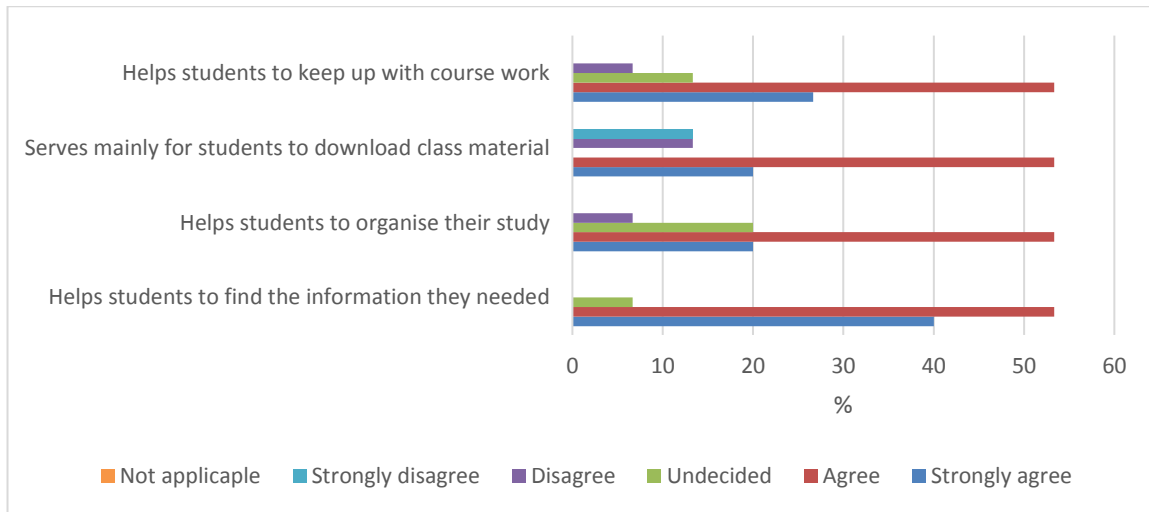


Figure 2: Conceptual scaffolding: Lecturer perspective

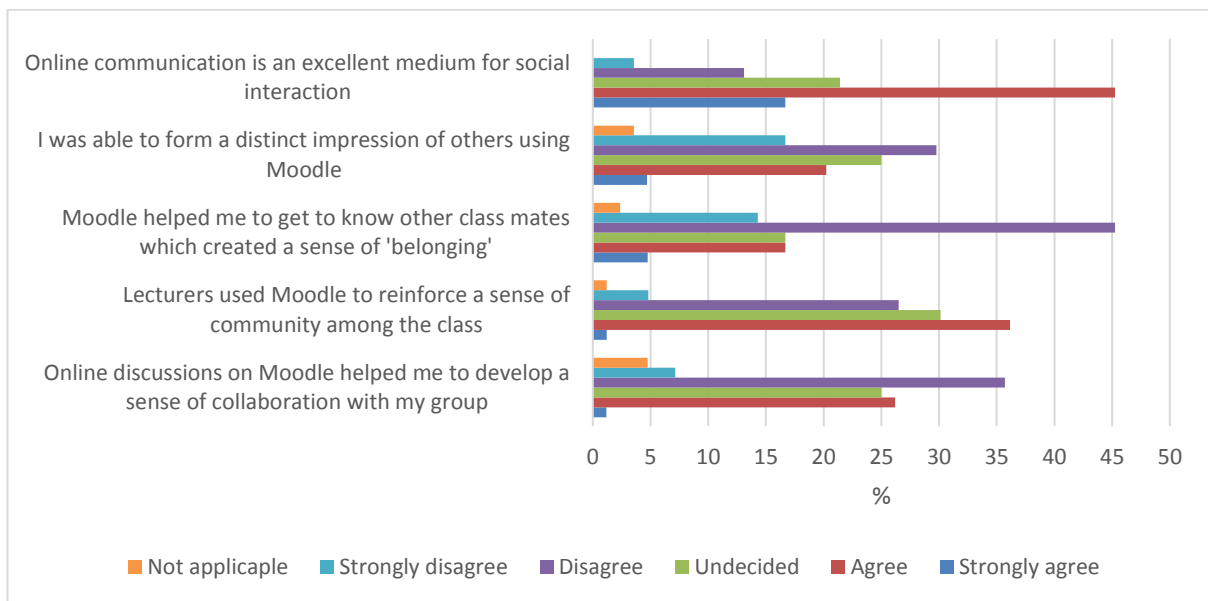


Figure 3: Social interaction: Student perspective

In addition, Table 4 presents a summary of quantitative findings and shows that Moodle facilitates social constructivism principles to a limited extent when social constructivism principles are mapped against lecturer usage of Moodle functionality, as adapted from Dougiamas (2013).

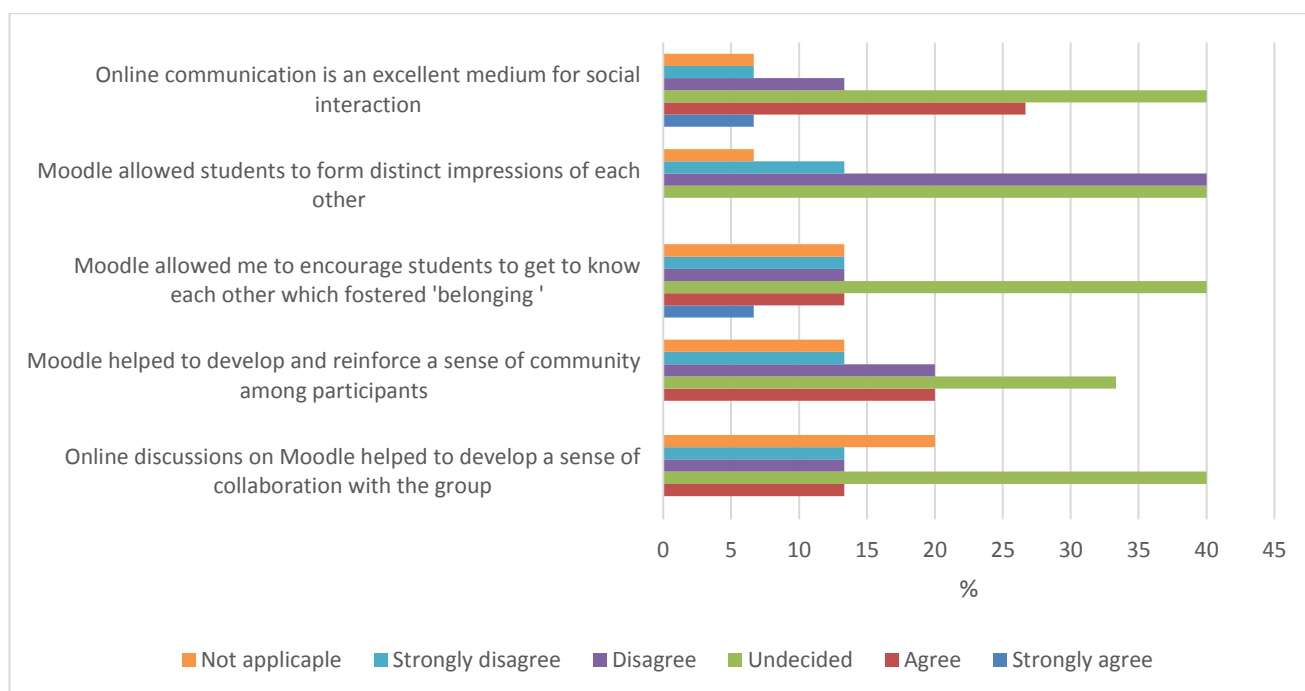


Figure 4: Social interaction: Lecturer perspective

### 3.2 Qualitative results from focus groups.

The focus groups corroborated the survey findings regarding Moodle facilitating conceptual scaffolding, which emerged as a significant theme. For example:

*'When they put the rubric up, it's good to refer back to, especially if you're doing essays.'*  
(*'Jim'*<sup>1</sup>, Student, 1: 14-16.)

*'Keeping them on task, I think just the way I lay it out and I reveal it section by section so that when they go on to Moodle, they know where they are on the syllabus.'*(*'Debbie'*, Lecturer, 1: 23-24)

The focus groups corroborated the survey findings regarding active learning and knowledge construction, which did not emerge as significant themes from student or lecturer perspectives. In addition, social interaction did not emerge as a significant theme from the student focus group and in fact, the opposite perspective came through. For example:

*'It's just not very interactive, you go on and you download the slides and sometimes I wouldn't go on it again, I check my emails every day but I wouldn't go back and check*

<sup>1</sup> All names are pseudonyms.

*the course.*' ('Gail', Student, 3: 127-129.)

Table 4: Summary of quantitative data

|                                 |   |    |
|---------------------------------|---|----|
| Social constructivism principle | Lecturers used function facilitating social constructivism principle very often or often in fourth year of GMIT business degree | %  |
| Knowledge construction:         | Passive unfaciltated forum  | 40 |
|                                 | Active and guided forum   | 20 |
|                                 | Provide feedback on uploaded assignments  | 67 |
| Active learning:                | Active and guided forum   | 20 |
|                                 | Quizzes   | 50 |
|                                 | Feedback on uploaded assignments  | 67 |
|                                 | Wikis   | 7  |
|                                 | Databases   | 20 |
|                                 | Glossaries  | 13 |
|                                 | Roles implementation  | 14 |
| Social interaction:             | Message students  | 87 |
|                                 | Upload notes and readings   | 93 |
|                                 | Wikis   | 7  |
|                                 | Glossaries  | 13 |
|                                 | Databases   | 20 |
|                                 | Workshop (peer-review function)   | 0  |
|                                 | Active and guided forum   | 20 |
| Conceptual scaffolding:         | Communicate course structure and administration   | 87 |
|                                 | Communicate module learning outcomes  | 87 |
|                                 | Communicate important module topics   | 84 |
|                                 | Download class material   | 93 |
| Procedural scaffolding:         | Badges  | 14 |
|                                 | Conditionality  | 13 |
|                                 | Rubrics   | 33 |
| Strategic scaffolding:          | Active and guided forum   | 20 |
|                                 | Provide feedback on uploaded assignments  | 67 |
| Metacognitive scaffolding:      | Active and guided forum   | 20 |
|                                 | Rubrics   | 33 |
|                                 | Workshop (peer review function)   | 0  |

However, social interaction did emerge as a theme from the lecturer focus group, although this was skewed towards two lecturers. For example:

*'I use databases so I might give them an exercise in a tutorial and then ask them to input their output from that, into a data base, at some point over the next week or two and then everybody can see that.'* ('Debbie', Lecturer, 1-2: 44-48).

*'When they see people putting stuff up [using workshop], they sort of change their behaviour because just the very fact that it is happening, they don't have to have looked at another student's work, but they know other students work is going up and being shared. Brackets added.'* ('Andrew', Lecturer, 2: 76-82.)

### **3.3 Qualitative data explaining quantitative results.**

The quantitative analysis showed that Moodle was not used to facilitate social constructivism principles in the final year of a GMIT business degree to any great extent. The qualitative analysis helps explain this observation. Barriers, defined here, as factors that create a barrier to using Moodle to facilitate social constructivism principles in the final year of a GMIT business degree, emerged as a frequent theme in both the student and lecturer focus groups. Barriers reported included technical issues, lack of time and training, availability of alternative technologies, social interaction being more effective face to face and inhibitions. Below are a few selected quotes to illustrate these barriers:

#### **3.3.1 Technical issues**

Lecturers displayed a willingness and an appetite to use Moodle but cited (n=3) technical issues as a barrier to using Moodle. For example:

*'I used databases all the time, and I just switched last year because Moodle...there was another step added to it, and I thought this is just going to take me forever with 160 in the class.'* ('Susan', Lecturer, 5: 226-231).

### 3.3.2 Lack of training and time.

Lecturers showed a willingness to embrace new functions in Moodle that would facilitate social constructivism principles. However, they often cited (n=5) a lack of training and time as a barrier to using Moodle. For example:

*'The difficulty is in knowing how to use all these things. When I used the Wiki; I probably spent a full week, 40 hours, at least, trying to figure it out because nobody knew how it worked.'* ('Debbie', Lecturer, 7: 295-299).

### 3.3.3 Alternative technologies

The availability of other technologies with similar functionalities was a recurring theme in both the student (n=6) and staff (n=5) focus groups. This may be because students prefer the familiarity of platforms they are already using socially or because alternative technologies are more user friendly. For example:

*'They might be more likely to ask somebody one on one, like in a Facebook message rather than put it public [on a Moodle forum] where everybody can see it.'* ('Gail', Student, 4, 152-154).

### 3.3.4 Social interaction more effective face to face.

Lecturers and students reported frequently (n=5) that the most effective forum for social interaction to support learning was face to face in a full-time programme such as this one and that this displaced the need for social interaction on the Moodle platform. For example:

*'Maybe they feel that they've had that discussion in class and there's no need to have it online.'* ('Jim', Student, 4, 149-150).

### 3.3.5 Inhibitions

Both students (n=2) and lecturers (n=3) alluded to inhibitions as a barrier to using Moodle for social interaction. For example:

*'Maybe the lecturer seeing what you're putting up or discussing...they might feel they are asking the wrong questions.'* ('Frank', Student, 4, 148, 151).

*'I did a feedback thing to see how they felt about [forums], and most of them said they didn't want to look like a fool asking questions, so it was that they feel stupid.'* ('Susan', Lecturer, 8: 344-346).

## 4. Discussion.

### 4.1 Limited degree to which Moodle facilitates social constructivism.

Despite the fact that Moodle is rooted in social constructivism principles, and that Moodle can, in theory, facilitate these principles, there is little evidence that engagement with Moodle facilitates social constructivism principles in practice in this group. Students and lecturers largely agreed that Moodle did not facilitate active learning. Furthermore, students criticised the lack of active engagement within Moodle. In addition, functions, which support these principles, were used to a very limited degree.

Students and lecturers did not believe that Moodle facilitated social interaction. The evidence did show that while some pioneering lecturers piloted Moodle functions promoting social interaction such as wikis or workshop, they were often abandoned due to the substantial time investment. Student surveys did show that Moodle supported knowledge construction, but this was not corroborated in the student focus groups. Staff disagreed that Moodle facilitated knowledge construction to any degree.

In fact, the evidence suggests that the delivery of module content and module administration continues to be the most common way in which Moodle is used with most teaching and learning occurring in the classroom. This corresponds to what Francis and Raftery (2005, p. 2) categorise as Mode 1 usage which is labelled '*baseline course administration and learner support*'. The literature suggests that baseline use of Moodle is not unique to GMIT's School of Business. For example, Blass and Davis (2003), Carvalho, Areal and Silva (2011) and Jenkins, Browne, Walker and Hewitt (2010) consider that VLEs provide very limited active learner participation and are mainly used to put teaching materials online. Donnelly and O'Rourke (2007,) suggest that eLearning products are often lauded on the basis of their constructivist approach to learning, but in reality sustained inter-student contact and discussion can be difficult to maintain.

Costa, Alvelos and Teixeira (2012) found similarly that Moodle functions that enable interaction and collaboration between students were not used on a Moodle platform in a university in Portugal.

#### **4.2 Moodle facilitates scaffolding.**

There was evidence to suggest that engagement with Moodle does facilitate scaffolding in the final year of a GMIT business degree at a superficial level. For example, both students and lecturers strongly agreed that Moodle facilitates conceptual scaffolding, which helps students decide what to consider in learning and guides them to key concepts (Jumaat & Tasir, 2014). This came through in both the surveys and focus groups. Students reported that Moodle is used to outline learning outcomes and this '*keeps you on track during the semester*'. Another student reported that the rubric was useful to refer back to when doing assignments. Lecturers also reported Moodle allows them to reveal the syllabus section by section, so students know where they are on the syllabus. There is limited evidence from surveys or focus groups to suggest that Moodle is used to facilitate deeper forms of scaffolding such as strategic or procedural scaffolding.

#### **4.3 Barriers to Moodle facilitating social constructivism principles.**

The focus group findings helped to explain why the survey findings suggested that Moodle was not used to facilitate social constructivism principles. The main barriers reported to using Moodle to facilitate social constructivism principles are lack of training and time, availability of alternative technologies, more effective face-to-face social interaction and inhibitions.

First, it is well documented that good technical support is a motivating factor for teachers to use VLEs (Donnelly & O'Rourke 2007). Lecturers in this study reported a desire to use other functions in Moodle but cited a lack of training and support as a barrier to Moodle use. For example, one lecturer reported using Wikis, which would foster social interaction and knowledge construction but abandoned it due to lack of IT support and them being '*clunky and awkward*'. Another lecturer cited that workshop was '*awkward*' and '*very non-transparent the way it works*'. In line with this study, a lack of support has been identified as a barrier to VLE use by Browne, Jenkins and Walker (2006) and Lyng (2011).

Second, lecturers reported time as a constraint in setting up new functions in Moodle, a theme

reflected in the literature. For example, Donnelly and O'Rourke (2007) suggest that a primary limiting factor for teachers is their ability to commit time to innovation in VLEs. For example, one lecturer reported using forums where students posted comments and critically assessed each other's comments, which does promote social constructivism principles such as knowledge construction and social interaction but abandoned it after one iteration due to the unreasonable time investment. While Fox and Mackeogh (2010) do consider VLE functions that promote higher order learning that do not make excessive demands on tutor time, they acknowledge that further work is required to demonstrate conclusively that eLearning can enhance higher-order learning with reasonable levels of lecturer input.

Third, lecturers reported it was more effective to promote social constructivism principles in the classroom given that they were physically meeting students three times a week in this full-time programme. This correlates with the literature where social constructivists see learning as essentially a social process, which cannot effectively be replaced by technology, although technology may facilitate it (Bates, 2015). In addition, Donnelly and O'Rourke (2007) suggest lecturers may revert to using VLEs as a method for distributing lecture notes when VLEs fail to reproduce or simulate an equivalent face-to-face experience. Similarly, De Leng, Dolmans, Muijtjens and van der Vleuten (2006) suggest that when there is regular face-to-face contact, forum use is rarely successful. In this context, it would be interesting to evaluate to what extent engagement with Moodle in a fully online programme would facilitate social constructivism.

Fourth, lecturers and students reported bypassing Moodle and using other technologies to facilitate learning. Lecturers reported that some Moodle functions had technical difficulties and that alternative technologies were more student friendly. This is somewhat reflected in the literature. For example, (Allen, 2015) found a clear preference for social media rather than an institutional VLE as a forum for discussing content related questions. Hollyhead, Edwards and Holt (2012, p. 369) suggest that students' voluntary use of social network sites as a complement to formal learning is culturally embedded in HEIs and constitutes a widely accepted 'integral' part of the learning experience. This may represent difficulties around control of content and ensuring that the platform is exclusively accessible by students and used only for academic purposes (Hatzipanagos & John, 2017). However, it is worth noting that students exercising choice regarding the platform used is central to social constructivism concepts such as knowledge construction and active learning.

Fifth, students and lecturers reported that student displayed inhibitions when using online



forums and that they were more likely to communicate privately. This is also echoed in the literature, for example, Lyndon and Hale (2015) and Rowett (2016) consider social and cultural factors, such as feelings of '*doing something wrong*' in an exposed environment.

## 5. Conclusion

This paper set out to investigate how engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree. This study used a case study research strategy, which explored student and lecturer engagement with Moodle in this group using a mixed methods approach. The data collection instruments included surveys and focus groups with final year business students and lecturers. The main conclusions are that: Moodle does not facilitate social constructivism principles in the final year of a GMIT business degree. However, Moodle does facilitate limited scaffolding and in particular, conceptual scaffolding. Finally, there are many barriers to using Moodle to facilitate social constructivism principles in this group.

In light of these findings, a number of enablers are suggested that might help to harness the full potential of Moodle to facilitate the social constructivism principles. These recommendations are categorised under technical, policy and cultural enablers.

### 5.1 Technical enablers.

It is important to ensure sufficient technical training and on-going support for Moodle use. Online support for GMIT is available through a passive Moodle forum facilitated by an educational technologist. However, education technologists could also work with lecturers to assist them to innovate, review, develop, populate and maintain modules in the online environment. In addition, if the institutionally controlled Moodle could be aligned with the user friendliness of other social media, lecturers and students might be less likely to use other technologies in place of Moodle.

### 5.2 Cultural enablers.

As long as the traditional classroom exists, it is unlikely that lecturers will use Moodle to its full

potential as they consider traditional face-to-face interaction more effective. Perhaps the School of Business could develop some programmes that are Moodle dependent and do not rely on the traditional classroom. While a fully online synchronous programme might need to employ other technologies that have functions that mimic a real classroom (such as breakout rooms or hands- up flags), such an approach would at least build up expertise in the Moodle space. This would help to exploit Moodle's potential to facilitate social constructivism principles in fully online (synchronous and asynchronous), blended and traditional forms of delivery.

In addition, Moodle could be promoted based on solving teaching challenges that lecturers face rather than lecturers taking time to learn a new Moodle function. There has to be a clear rationale and payback for time-constrained lecturers to exploit Moodle's potential. Perhaps a professional development module could be built which addresses teaching challenges by using Moodle functions.

### **5.3 Policy enablers.**

In terms of encouraging Moodle use, a professional development module on Moodle could be accredited as part of a teaching award. This could then be used as an explicit barometer for promotion which is an important motivator for lecturers to embrace VLEs (Donnelly & O'Rourke, 2007). In terms of encouraging Moodle use from the top down, evidence of Moodle use to facilitate the achievement of learning outcomes could be included at the programme approval process. For example, a learning outcome at level 8 for an honours degree is to act effectively under guidance in a peer relationship with qualified practitioners; lead multiple, complex and heterogeneous groups (QQI, 2014, p.5). This learning outcome mirrors social constructivism principles such as scaffolding, knowledge construction and social interaction. Lecturers could show during the programme approval process how learning outcomes are achieved using Moodle functions.

This case study only considers Moodle use in the final year of a GMIT business degree. Future research work could consider a replicated study across all levels of a business degree in GMIT or in the final year of a business programme in other higher educational institutes. The evaluation of Moodle usage to facilitate social constructivism principles would help inform what is occurring in Moodle from a social constructivism perspective and advance Moodle use from a policy and practice perspective to a position where it might be used as constructed, that is, to

support learning and teaching from a social constructivism perspective

## 6. References

- Alanazi, (2016). A critical review of constructivist theory and the emergence of constructionism. *American Research Journal of Humanities and Social Sciences* (ARJHSS). 2, 1-8.
- Allen, C. (2015). Social media as an alternative to Moodle in EFL teaching practice forums. In F. Helm, L. Bradley, M. Guarda, & S. Thouèsny (Eds.), *Critical Call*. Proceedings of the 2015 EUROCALL Conference (pp. 9-15). Padova, Italy. Available <https://files.eric.ed.gov/fulltext/ED564165.pdf>. Accessed 15 April 2018.
- Ally, M. (2008). Foundations of educational theory for online learning. In T Anderson (Ed) *The theory and practice of online learning*. (2<sup>nd</sup> ed. pp.15-44). Edmonton: AU Press, Athabasca University.
- Amerian, M. & Mehrib, E. (2014). Scaffolding in Sociocultural Theory: Definition, Steps, Features, Conditions, Tools, and Effective Considerations. *Scientific Journal of Review*, 3(7), 756-765
- Amineh, R. & Asl, H. (2015). Review of constructivism and social constructivism. *Journal of Social Sciences, Literature and Languages*, 1(1), 9-16
- Bates, A. (2015). *Teaching in a digital age: Guidelines for designing teaching and learning*. Tony Bates Associates Ltd.
- Blass, E. & Davis, A. (2003). Building on solid foundations establishing criteria for e-learning development. *Journal of Further and Higher Education*, 27 (3), pp. 227–245.
- Bozkurt, G. (2017). Social constructivism: Does it succeed in reconciling individual cognition with social teaching and learning practices in mathematics? *Journal of Education and Practice*, 8 (3), 210- 218.
- Browne, T., Jenkins, M. and Walker, R. (2006). A longitudinal perspective regarding the use of VLEs by higher education institutions in the United Kingdom. *Interactive learning Environments*. 14(2), pp. 177-192.
- Bruner, J. (1978). The role of dialogue in language acquisition. In A. Sinclair, R., J. Jarvelle, and W. Levelt (eds.) *The child's concept of language* (pp. 241-.256). New York: Springer-Verlag.
- Carvalho, A., Areal, N. & Silva, J. (2011). Students' perceptions of Blackboard and Moodle in a Portuguese university. *British Journal of Educational Technology*, 42(5), 824-841.
- Cohen, L. Manion, L. & Morrison, K. (2011). *Research methods in education*. (7<sup>th</sup> Ed.). London: Routledge.
- Cole, M. (2009). Using Wiki technology to support student engagement: Lessons from the trenches. *Computers & Education*, 52(1), pp.141-146.
- Costa, C., Alvelos, H. & Teixeira, L. (2012). The use of Moodle e-learning platform: a study in a Portuguese university. *Procedia Technology*, 5, 224-243.
- De Leng, B., Dolmans, D., Muijtjens, A. & van der Vleuten, C. (2006). Student perceptions of a virtual learning environment for a problem based undergraduate medical curriculum. *Medical Education*. 40 (2), 568-75.
- Dewey, J. (1938). *Experience and education*. New York, N.Y: Touchstone. Available at <https://archive.org/details/ExperienceAndEducation>. Accessed 25 September 2018.
- Donnelly, R. & O'Rourke, K. (2007). What now? Evaluating eLearning CPD practice in

Irish third-level education. *Journal of Further and Higher Education*, 31(1), 31–40.

Dougiamas, M. (1998). *A Journey into constructivism*. Available at <https://dougiamas.com/archives/a-journey-into-constructivism/>. Accessed 15 May 2017.

Dougiamas, M. (2013). *Pedagogy*. Available at <https://docs.moodle.org/23/en/Pedagogy>. Accessed 17 May 2017.

Fox, S. & Mackeogh, K. (2010). Can eLearning promote higher-order learning without tutor overload? *Open Learning: The Journal of Open, Distance and e-Learning*, 18:2, 121-134.

Francis, R. & Raftery, J. (2005). Blended learning landscapes. *Brookes eJournal of Learning and Teaching*, 1(3), 1–5.

Freeman, T. (2006). 'Best practice' in focus group research: making sense of different views. *Journal of Advanced Nursing*, 56(5), 491–497.

Grosbeck, G. (2009). To use or not use web 2.0 in higher education? *Procedia – Social and Behavioural Sciences*, 1, 478–482.

Harkness, S. (2009). Social constructivism and the believing game: a mathematics teacher's practice and its implications. *Educational Studies in Mathematics*, 70, 243-258.

Hatzipanagos, S. & John, B. (2017). Do Institutional social networks work? Fostering a sense of community and enhancing learning. *Technology, Knowledge and Learning*. (22)2, 151-159.

Helling, K. & Petter, C. (2012). Collaborative knowledge construction in virtual learning environments: A good practice example of designing online courses in Moodle. In Ertl, B (2012) (ed.) *Technologies and Practices for Constructing Knowledge in Online Environments: Advancements in Learning*. Information Science Research, Chapter 5.10, pp 1329-1059. Hershey: New York.

Hollyhead, A., Edwards, D., & Holt, G. (2012). The use of virtual learning environments (VLE) and social network site (SNS) hosted forums in higher education: A preliminary examination. *Industry and Higher Education*, 26 (5), 369-379.

Jenkins, M., Browne, T., Walker, R. & Hewitt, R. (2010). The development of technology enhanced learning: findings from a 2008 survey of UK higher education institutions, *Interactive Learning Environments*, 19(5), 447-465.

Jumaat, N. & Tasir, Z. (2014). *Instructional scaffolding in online learning environment: A meta-analysis*. 2014 International Conference on Teaching and Learning in Computing and Engineering (pp. 74-77). Kuching, Sarawak, Malaysia. Available at <https://ieeexplore.ieee.org/document/6821832/> Accessed 19 October 2017.

Kafai, Y. & Resnick, M. (1996). *Constructionism in practice: designing, thinking and learning in a digital world*. Lawrence Erlbaum Associates.

Kivunja, C. (2014). Do you want your students to be job-ready with 21<sup>st</sup> century skills? Change Pedagogies: A Pedagogical Paradigm Shift from Vygotskyian Social Constructivism to Critical Thinking, Problem Solving and Siemens' Digital Connectivism. *International Journal of Higher Education*, 3(3), 81-91.

Lyndon, S. & Hale, B. (2015). Evaluation of how the blended use of a virtual learning environment (VLE) can impact on learning and teaching in a specific module, *Enhancing Learning in the Social Sciences*, 6(1), 56-65.

Lyng, R. (2011). An investigation into the existence of barriers to Moodle adoption in an Irish third level educational institute. *Flexible Learning*. Proceedings of the Fourth Annual conference of the National Academy for the Integration of Research, Teaching and Learning. p.77. Available at <http://www.nairtl.ie/documents/LyngRichie.pdf>. Accessed 12 February 2018.

McKinley, J. (2015). Critical argument and writer identity: Social constructivism as a theoretical framework for EFL academic writing. *Critical inquiry in language studies*, 12(3), 184-2017.

McLeod, S. (2015). *Jean Piaget*. Available at

<https://www.simplypsychology.org/piaget.html>. Accessed 17 September 2017.

Patton, M. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, CA: Sage.

QQI. (2014). *Awards standards – generic higher education and training*. Dublin: QQI. Available at <https://www.qqi.ie/Publications/Publications/Generic%20Major%20Awards%20-%20QQI%20Awards%20Standards.pdf> Accessed 19 April 2018.

Rowett, S (2016). A next generation digital learning environment for UCL. Available at <https://blogs.ucl.ac.uk/digital-education/2016/11/07/a-next-generation-digital-learning-environment-for-ucl/>. Accessed 9 March 2018.

Trif, L. (2015). Training models of social constructivism. Teaching based on developing a scaffold. *Social and Behavioural Sciences*, 180, 978-201.

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cole, M., John-Steiner, V., Scribner, S. & Souberman, E. (eds). Cambridge, MA: Harvard University Press.

Wertsch, J. (2009). *Vygotsky and the social formation of mind*. Cambridge, MA: Harvard University Press.