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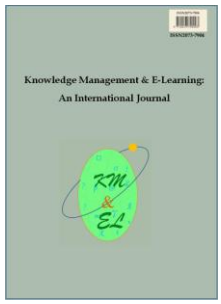

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Adding to the mix: Students use of Facebook groups and blackboard discussion forums in higher education

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Abstract: This paper reports on a case study of the use of Facebook in learning and teaching in higher education. Facebook was used as a venue for online discussion to support the existing Learning Management System (in this case Blackboard) in the unit Internet Collaboration and Organisation as part of the Internet Communications degree taught fully online through Open Universities Australia (OUA). Students' posts to both Facebook and the Blackboard discussion forum were analysed for content, length, and when throughout the study period they were posted. This is significant as much of the previous work in this area has relied on students self-reporting, rather than direct observation of student behaviour. These results were then compared to earlier instances of the same unit that ran within the previous twelve months, one fully online with OUA only using the Blackboard discussion group, and a second taught at Curtin University with both blended learning for students at the University's Bentley campus as well as fully online for external students, that utilised both Blackboard and Facebook. The results show that Facebook greatly increases the level of student activity in online discussions, both absolutely and in the level of sustained activity across the unit's study period. Facebook groups also had a different pattern of content from Blackboard. In Blackboard discussion is more focused on the set unit learning content, in Facebook students were using the groups to discuss administration and assignments and also bring in additional material from outside the units set learning materials. Facebook posts, while more sustained over the semester, were shorter in length. This study found that the addition of a Facebook discussion forum does not noticeably impact on the use of Blackboard's discussion forum, but rather adds a new dimension to the mix of online interaction. The paper concludes that there is value in using both of these forums for student interaction, but unit design needs to take into account the different affordances of each to maximise their utility.

Keywords: Facebook; Blackboard; eLearning; Student engagement

Biographical notes: Dr. Mike Kent is a Senior Lecturer and Head of Department of Internet Studies at Curtin University. His books include An Education in Facebook (2014) with Tama Leaver and Disability and New Media (2011) with Katie Ellis. Dr Kent's two main research interests focus on the use of social media and their potential in online learning and teaching as well as people with disabilities and their access to communications technology. More details can be found at www.cultware.com. Mike can also be found on twitter@cultware.

1. Background

In 2011 and 2012 Kent (2013) conducted a study looking at the role Facebook could play in learning and teaching in higher education. In this study a third-year unit in the Internet Communications degree at Curtin University, Internet Politics and Power (Net 303), was used as a case study with three instances of that unit used to compare the difference in student activity online both with and without Facebook. In an Australian higher education context, a 'unit' refers to a specific program of study taken over one semester of study as part of a broader degree structure. In this case the same unit was studied as it was run on three separate occasions. In the Australian summer of 2012/2013 this study was extended to another unit, in this case Internet Collaboration and Organisation (Net 308) run through Open Universities Australia. This instance is used as the focus of this case study and is compared to data from two previous instances of Net 308 taught both through OUA and at Curtin University's Bentley campus in 2011 and 2012. It is then also compared to results from the earlier Net 303 study. Both units have a similar student group, and the three examples used in each study dealt with similar class sizes and circumstances, thus allowing for trends to be better observed.

1.1. eLearning

eLearning is a growing area, Allen and Seaman (2011) found that in 2010 the number of enrolments in online education in the United States grew by 10% in an environment where overall enrolments were relatively static recording only 1% growth. They also found that 65% of all Chief Academic Officers surveyed said that online learning was a critical part of their online strategy. This is a number that has risen steadily and was up from 63% in 2010. Graham, Woodfield, and Harrison (2013) also note the rapid growth in blended learning, where education contains both face-to-face and online elements to learning. Some of this growth can be attributed to increasing student numbers putting stress on timetable and physical place constraints (Craig, Wozniak, Hyde, & Burn, 2009). However there are other advantages, Fichten et al. (2009) note that eLearning can promote inclusion both for students who are unable to attend class, and for students with disabilities who may be able to more easily access online digital course notes and hand outs than hard-copy versions. Open Universities Australia uses this mode of teaching to deliver higher education through the internet to a geographically dispersed student body across Australia and the world.

1.2. Facebook and online education

Facebook was founded as a student-only social space in 2004 by students at Harvard University. It has subsequently expanded beyond that foundation to have more than 1.3 billion users in June 2014 (Facebook, 2014). The network is increasingly used by higher education institutions to communicate with their students (Lenartz, 2012; Bateman & Willems, 2012). Lenartz (2012) notes this is a relatively recent phenomena and the possibilities for the use of this medium in higher education have only just begun to be realised and there is rising pressure on staff to use online social networking both inside and outside the classroom to connect with students. Bateman and Willems (2012) observe that this is met with a mixture of excitement and anxiety. Liccardi et al. (2007) warn of "the gap that is fast developing between social software and its use in education".

A number of studies have pointed to the potential for Facebook to be used as a tool for both learning and teaching in higher education (Bateman & Willems, 2012; Cheung, Chiu, & Lee, 2011; Kent & Leaver, 2014; Rivera, 2010; Tiryakioglu & Erzurum,

2011; Towner & Muñoz, 2011). As Bicen and Cavus (2013) note, "Facebook provides individuals with a way of maintaining and strengthening social ties which can be beneficial in both social and academic settings". The social network can be used to recruit students to classes and activities (Hilton & Plummer, 2012), for students to develop social capital (Cheung, Chiu, & Lee, 2011; Ellison, Steinfield, & Lampe, 2007) as well as to provide a level of trust to communities in a learning environment (Chang & Lee, 2013). Facebook has also been seen as a platform that is easier to use than many traditional learning management systems (Grey, Lucas, & Kennedy, 2010) and has the potential to act as a learning management system (LMS) in its own right (Bateman & Willems, 2012).

Wodzicki, Schwämmlein, and Moskaliuk (2012) observe that "Social media open up multiple options to add a new dimension to learning and knowledge processes. Particularly, social networking sites allow students to connect formal and informal learning settings". Allen (2012) notes this can blur the line between formal and informal education and cautions that this potentially challenges the traditional relationships in higher education between teachers and students (see also Brabazon 2007).

Baran (2010) also cautions that not all students are ready to embrace Facebook for formal learning and teaching. Students may identify it as a private social space that should not be intruded upon by teaching staff (Bateman & Willems, 2012; Best, Hajzler, Pancini, & Tout, 2011; Grey, Lucas, & Kennedy, 2010). Koonin (2013) notes the potential threat to reputation that can come from using open social networking sites. There is also the associated risk presented by cyber bullying and stalking (Bateman & Willems, 2012; Grey, Lucas, & Kennedy, 2010) and broader issues of student privacy (Palloff & Pratt, 2009). There are also issues of copyright that need to be taken into account when using Facebook (Palloff & Pratt, 2009), both in terms of what is posted in an essentially public environment, and also the place of an online discussion giving Facebook copyright over that conversation and its use as a marketing tool for Facebook's advertisers (Croeser, 2014). Students will also have different levels of literacy that they bring to the use of Facebook (McCarthy, 2010) and there are equity issues that need to be addressed for students who do not use Facebook (Grey, Lucas, & Kennedy, 2010). As Teclehaimanot and Hickman (2011) observe if Web 2.0 technologies such as Facebook are going to be used in teaching then it is important that educators know how to use them properly.

The average Facebook user spends 55 minutes a day using the social network across a variety of devices (Leonard, 2013). Given this, it is not surprising that as Grey, Lucas, and Kennedy (2010) observe, students visit Facebook more often than the more traditional LMS discussion boards. While each visit to Facebook might not result in a student viewing a specific unit's Facebook group they will be more likely to have the opportunity, and be more aware of any updates that have been made to the discussion. Darics (2014) has observed the value of this increased level of co-presence amongst participants who are geographically dispersed. Adding to this sense of co-presence is the increasing use of Facebook on mobile devices such as smartphones and tablets. As Shim, Dekleva, Guo, and Mittleman (2011) note this link between mobile devices and social networking sites "serves as a multitasking platform bridging social contexts such as professional and personal worlds, making mobile information exchange possible".

Facebook provides a variety of affordance of communications possibilities. Karl and Peluchette (2011) observed that staff find Facebook a much quicker way to communicate with students and Phillips (2011) notes the value of the 'like' function for fostering interactivity. Other functions such as the display of how many in the group have

seen a particular post, and also the ability to 'tag' a person in the group to bring their attention to a particular post can also be used particularly effectively in a learning and teaching context.

Facebook also presents a user with a single login, rather than a traditional LMS where a user will often have to navigate a number of screens and authentications to reach the discussion forum, and then a number of screen again once within the discussion area to engage with different threads. This is not just limited to Blackboard, student email account will often require a similar process, and may time users out at regular intervals. When notification of updates on content in the LMS discussion board is coming to such a university email account, any sense of co-presence is further disrupted.

In 2010 and 2011 students in a number of Internet Communications units were starting to form their own Facebook groups related to specific units where they were engaged in discussion of the unit content in a manner similarly outlined by Haverback (2009). In some cases teaching staff were invited, or asked themselves, to join these groups. However as student initiated and administered spaces this also created a tension between what was officially a space for unit discussion and what was informal. Some staff members, recognising this, were reluctant, or actively opposed to, intruding in these forums (Raynes-Goldie & Lloyd, 2014).

A study by Schroeder and Greenbowe (2009) previously explored the possibility of using Facebook as a forum for learning and teaching in higher education, finding it resulted in a nearly 400% increase in students' online activity. In order to take advantage of the potential opportunities offered by Facebook and reduce the tension between what is a formal and informal venue for class discussion a staff initiated and administered closed Facebook group was formed to be an official forum for discussion for the Net 308 instance in 2012/13. As Allen (2012) notes Facebook groups are the most practical way of utilising Facebook for educational purposes, limiting some of the privacy concerns for students and staff that might be raised if they were Facebook friends with each other, but still taking advantage of many of the communications features that Facebook offers through being members of the same group. In order to avoid excluding those students who were unwilling or unable to use Facebook, unlike the Schroeder and Greenbowe study, the discussion forum in the existing LMS was also retained as a venue for online discussions.

Junco (2013) has observed that much of the research into Facebook and its potential use in higher education involved self-reporting from students. Rather than self-reporting by students and staff this study measured the actual activity in each of these forums both in terms of the frequency of posts, and also the size and content of posts. This study was designed to explore the impact of adding a Facebook group as a formal discussion forum to complement the existing discussion board forum present in the Blackboard learning management system.

1.3. Internet collaboration and organisation: The unit

Internet Collaboration and Organisation (Net 308) is a unit that students would normally take in the third year of a degree in Internet Communications through OUA. The unit is conducted fully online. The OUA website describes the unit:

> *Virtual and networked organisations are the focus of this unit, recognising that networked computing has had a significant impact on public and private sector organisations. Increasingly, the internet is reshaping organisations and our*

> *experience of working within them. In this unit you will learn how and why organisations change as they utilise network technologies; you will consider the extent to which they have, therefore, become 'virtual'; you will see how the internet promotes collaboration. As a result you will become more effective in participating in and managing organisational change involving the internet.*
>
> *Open Universities Australia (2014)*

The unit's major assessment involves the students collaborating using the online tool Diigo to collectively gather and comment on resources on specific topics (Diigo, 2014). This collective data is then used as a resource for the students to draw on when writing their main essay assessment for the unit.

1.4. The students

The students in this instance of the unit were all studying fully online. Of the fifty five students the majority were located within Australia, although dispersed across the country. There was also a minority who were studying for some or all of the study period overseas. The data from this study period is compared below to two earlier instances of this unit. The first of these was also a cohort of OUA students studying in the summer of 2011/12. The twenty seven students in this earlier instance also studied fully online and were similarly dispersed geographically. The second group for comparison was a group of students studying the unit directly though Curtin University, in 2012, as both a fully online unit for the eleven external students and also as a blended learning unit taught both online and with a weekly classroom component for the twelve students who were enrolled internally at the University's Bentley campus. While all the OUA students were studying as undergraduates there were ten of the Curtin students studying the unit at a post-graduate level. While both the most recent OUA group and the Curtin group made use of Facebook in addition to the Blackboard learning management system's existing discussion board, the earlier group of OUA students did not use Facebook for online discussions.

1.5. Previous study: Net 303

The previous study (Kent, 2013) was focused on the unit Internet Politics and Power (Net 303). This unit, while covering different themes and content from Net 308 also involved a significant online component to its assessment. In one of the units three assessments students are expected to post a presentation online in a public forum such as YouTube or SlideShare, and to then comment and draw links between their own and other students' presentation. There was a very similar distribution in student numbers and modes of study in this earlier research and this makes a strong point for comparison. Given the timing of both studies it is likely that some overlap of students would have occurred between these two samples.

1.6. Features of the study period

The students in the primary group studied were taking part in OUA study period four of 2012/2013. This study period began in November 2012 and ran until February 2013. This period encompasses the Christmas and New Year periods that can be quite disruptive for students, particularly those with young families. The Australian summer of 2012/13 was also notable for a number of natural disasters including storms and flooding in the states of Queensland, New South Wales and Victoria and major bushfires in Tasmania. A

number of the students were impacted on by these events both as those affected by the disasters and also as volunteers with the various state emergency services and fire departments. A full breakdown on the students participating in each unit instance can be seen in Table 1.

Table 1
Comparative units and instances studied

Institution	Year	Mode of Study	Number of Students	Discussion Forum Used
Current Study: Net 308				
OUA	2012/13	Fully Online	55	Blackboard and Facebook
Curtin	2012	Fully Online and Blended Learning	23	Blackboard and Facebook
OUA	2011/12	Fully Online	27	Blackboard only
Previous Study: Net 303				
OUA	2012	Fully Online	45	Blackboard and Facebook
Curtin	2012	Fully Online and Blended Learning	25	Blackboard and Facebook
OUA	2011	Fully Online	23	Blackboard only

2. Methodology

At the end of the study period each post in both the Facebook group and the Blackboard discussion forum were analysed. Each post made by both students and teaching staff was measured for length and when during the study period it had been posted. The length of each post was categorised into 5 groups, 1-100 words, 101-200 words, 201-400 words, 401-600 words, and greater than 601 words. The time of posting for each comment was determined by which week of the period of study the post was made.

The topic or content of the post was also classified into one of six broad categories Admin, for posts relating to the unit or university administrative matters; Assignment Questions for posts related to the unit's set assignments, including both the questions and answers to those questions from both staff and students; Assignment Extensions, for posts regarding requests for extra time to submit assignments; Learning Links for posts that linked to or discussed links to material outside the units set tasks, readings and learning activities; Unit Learning Material for posts that related to the unit's set tasks, readings and learning activities; and Off Topic Posts for posts that were not related to the unit.

The range of measurements for each of these variables was chosen to mirror the earlier study and make for a more valid point of comparison. These in turn were determined before the commencement of the study in accordance with submission made to the university's Human Research Ethics Committee for approval for the study.

At the end of the study period, when students are unenrolled from the Blackboard LMS all the posts in the discussion board are automatically anonymised once the students' names are no longer on the system. However, in the Facebook group, students' names and links to their profiles remain at the end of the study period. In order to protect the privacy of the individuals involved, and to comply with the terms of reference granted to the study by the university's Human Research Ethics Committee, the information was anonymised at the point of collection. Data collection was done manually, observing the date of posting, the length of the post, and the topic, from the relevant student forums on Blackboard and Facebook.

3. Results

3.1. Activity measures

The first point of comparison measured was the level of activity on the Blackboard discussion forum. Given the different class sizes Fig. 1 shows the posts per students per week for each instance of the unit. Taking the total posts in each week, and dividing them by the number of students studying that instance of the unit. Different student numbers will not necessarily affect the level of student activity in a linear way, however mapping the activity as posts per student provides an effective way of displaying the differences between these three instances. The similarities in the pattern of activity are also more evident.

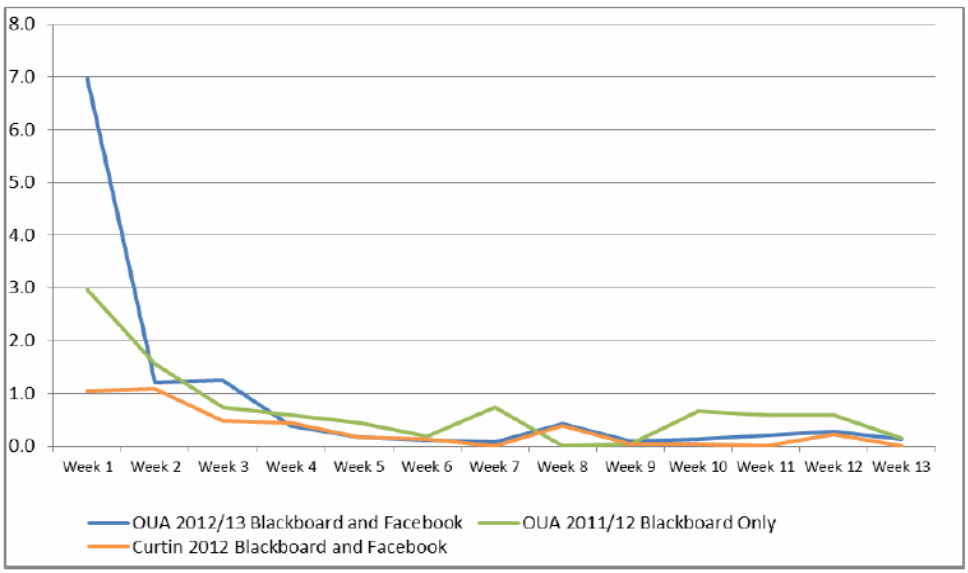

Fig. 1. Comparative posts per student in blackboard only

As can be seen from Fig. 1 activity on Blackboard for the 2012/13 instance was very high in the first week, and then dropped off after week three. This compares to the previous instance with OUA from 2011/12 where Blackboard was the only discussion forum. Again, activity dropped away quickly after week three, although the intensity of activity in the earlier part of the unit, even when the smaller enrolment is considered, is not as strong. The second point of comparison is with the Curtin student group.

Anecdotally Curtin students have been seen as less active online than their OUA counterparts and this result would seem consistent with that observation. In each of these three examples despite the different absolute levels of activity a similar pattern of activity emerges.

In the OUA class without the use of Facebook there are a total of 9.3 posts per student across the whole study period. In the Curtin University instance this dropped to a relatively modest 4.0 posts per student in the Blackboard discussion forum. In the 2012/13 OUA group the posts in Blackboard rise to 11.4 posts per student. While there was more activity across both Facebook and Blackboard for this group, there was also more activity specifically in the Blackboard forums.

The previous study of Net 303 also showed this similar pattern of activity in the Blackboard forums, with each having a similar pattern of week by week activity across the semester (although one quite different to the Net 308 pattern). There were also comparable total posts per student across the study period with the Blackboard only group having 10.3 posts per student, the Curtin group a similarly lower 5.8, and the OUA group with Facebook 7.1 posts in the Blackboard discussion forums.

When the OUA 2012/13 Facebook group is analysed the pattern of activity is quite different with student activity increasing in frequency throughout the study period. A similar although less pronounced pattern can also be seen in the Facebook group from the Curtin students.

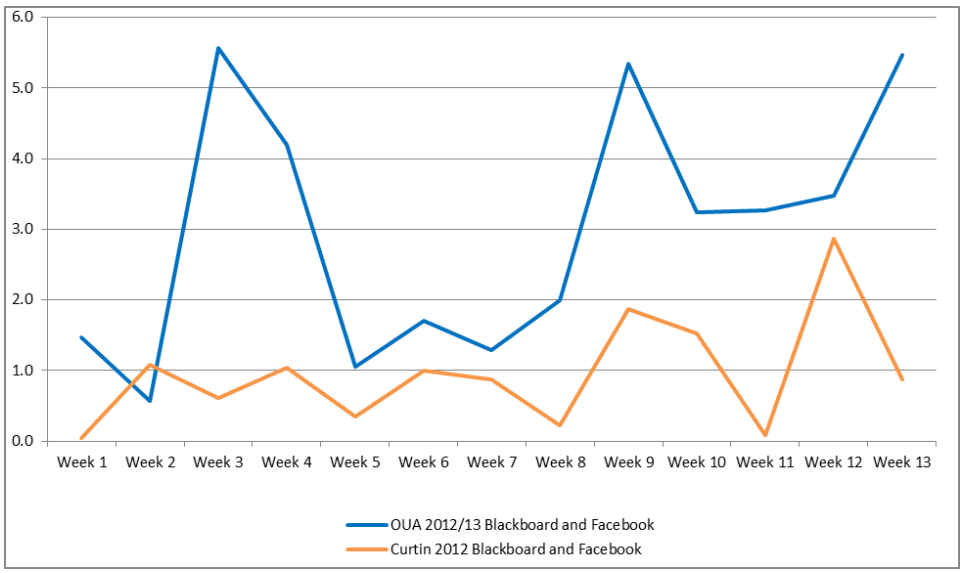

Fig. 2. Comparative posts per student in Facebook only

By comparing the combined information from both Facebook and Blackboard a more complete analysis of activity across the study period can be mapped, as shown in Fig. 2.

The addition of Facebook as a discussion forum adds not just to the total level of activity for the study period, but also how that activity is sustained across the full 13 weeks of the unit, as can be seen in Fig. 3. In the 2012/13 unit there were 50.1 total posts per student over the whole study period, this is considerably higher level than the 9.3

posts per student in the 2011/12 class that did not use Facebook. The Curtin students, many of who also met for face-to-face classes still showed a higher, if not quite so dramatic, levels of activity increase and posting with 14.8 posts per student. Again these are comparable to the earlier study as illustrated in Table 2 below that shows the number of posts as well as the changes in activity once Facebook groups are used.

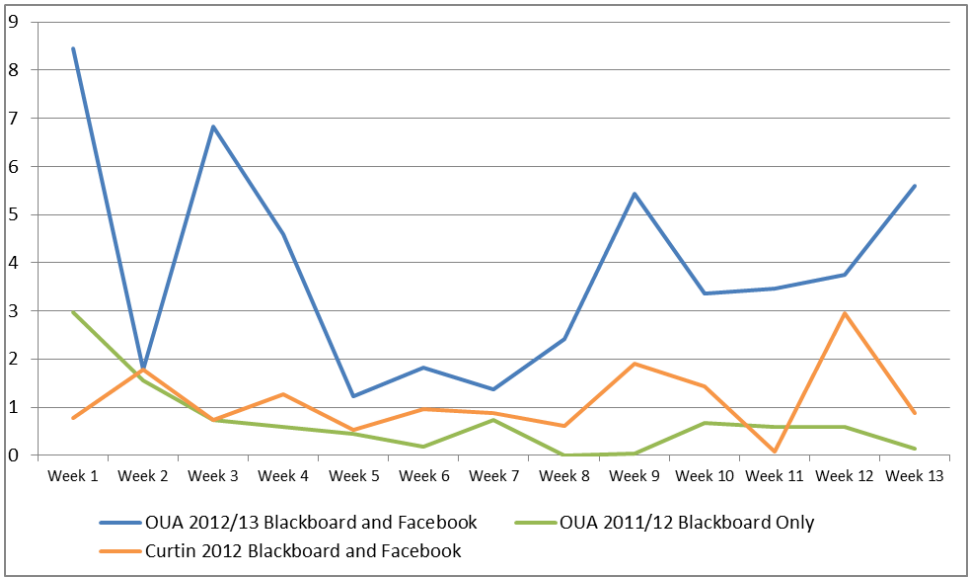

Fig. 3. Comparative posts per student in all discussion forums

Table 2
Comparative activity in units and instances studied

Institution	Year	Mode of Study	Number of Students	Discussion Forum Used	Post Per Student Blackboard	Total Posts per Student	Activity Growth
Current Study: Net 308							
OUA	2012/13	Fully Online	55	Blackboard and Facebook	11.4	50.1	439%
Curtin	2012	Fully Online and Blended Learning	23	Blackboard and Facebook	4	14.8	59%
OUA	2011/12	Fully Online	27	Blackboard only	9.3	9.3	
Previous Study: Net 303							
OUA	2012	Fully Online	45	Blackboard and Facebook	7.1	40.6	294%
Curtin	2012	Fully Online and Blended Learning	25	Blackboard and Facebook	5.8	22.2	116%
OUA	2011	Fully Online	23	Blackboard only	10.3	10.3	

3.2. Length of posts

The second measure that was made of student activity was the length of each post, the rational being that longer posts would involve a presumably deeper level of engagement. Again starting with Blackboard there is a similar distribution of posts in all three classes. Fig. 4 shows the posts per student in each size category for the whole study period for each of the three instances of the unit studied. There are fewer posts in each category for the Curtin students representing their overall lower level of online activity that is perhaps a reflection of their additional activity in each week's face to face class.

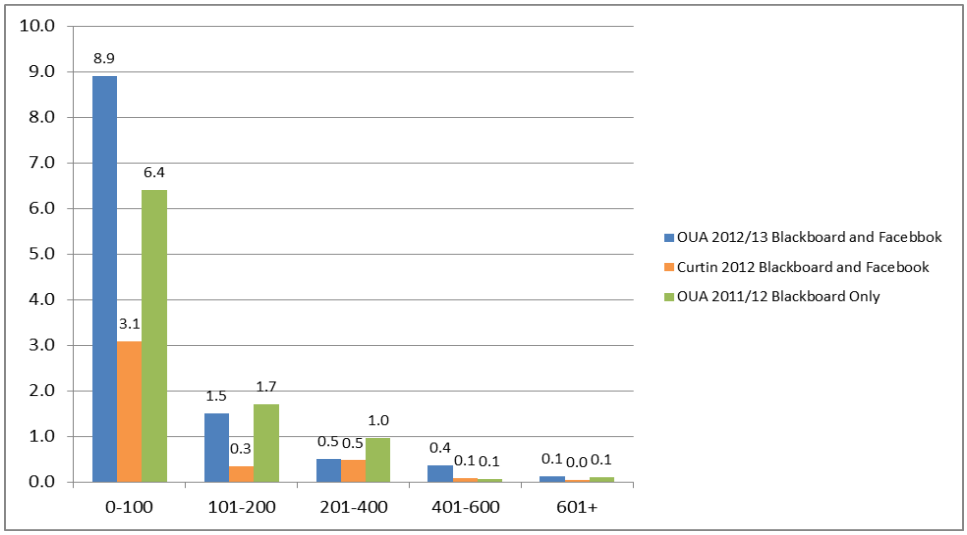

Fig. 4. Post length blackboard only

The Facebook groups had a noticably different patten, as can be seen in Fig. 5, with posts clustered far more in the 0-100 group.

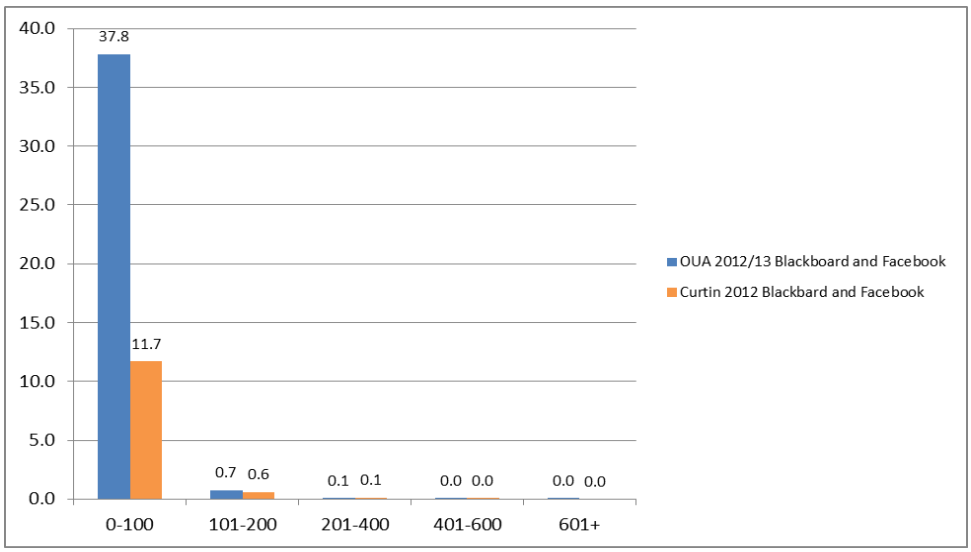

Fig. 5. Post length Facebook only

When the two forums are combined, the addition of Facebook has clearly generated a greater number of smaller posts. However as can be seen from Fig. 6 the number of longer posts has not been significantly affected, although as can be seen from the above graphs, these posts occur most often in the Blackboard discussion forum. This was a pattern that was again reflected in the earlier study of Net 303.

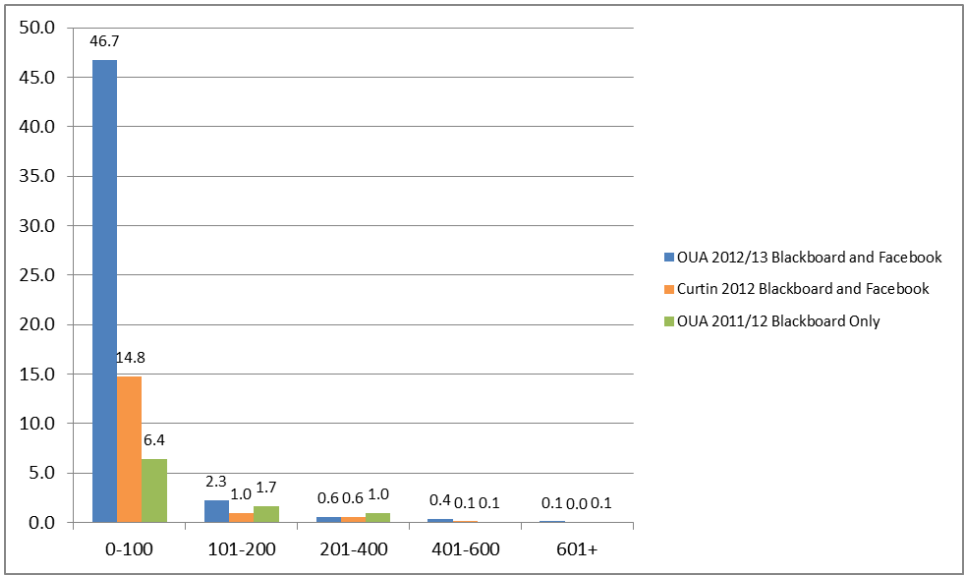

Fig. 6. Post length all forums

3.3. Content

Each post was analysed for its content and placed into one of six categories. These are shown below as the distribution of these topics as a percentage of the total posts across the entire study period for each instance of the unit. The pattern of activity in relation to each of these categories in the Blackboard discussion forum is very similar across the three classes, as shown in Fig. 7. However there are a higher proportion of off topic posts in the 2012/13 class. This is partially a reflection of the high number of posts in week one of the study period in this forum. Students' posts introducing themselves and welcoming others to the class were placed in this category, and these are clustered in week one, particularly in this instance. The Curtin students made noticeably more use of this forum to discuss assignment questions, which is a surprising result given a large percentage of this group had the potential to raise these discussions in class.

Posts on the the Facebook group, as shown in Fig. 8, produced a noticably different pattern of content, although once again, with a high level of off topic posts from the 2012/13 class. Conversely the Curtin students made little use of this forum to enage in off topic conversations. There is a high degree of symetry between the distribution of content although again somewhat distorted by this significant disparity in the level of participation in off topic conversations. The most obvious standout in the Facebook group is the rise of the precentage of the posts around learning links, growing from 0.3 percent and zero percent of posts in Blackboard to 9.3 percent and 14.3 percent respecivly. This is a significant shift from the 4 percent of posts in this category in the Blackboard only group from 2011/12 (although it does also suggest that as well as grow

as a percentage of activity overall it has clearly shifted almost all this type of post to the Facebook group).

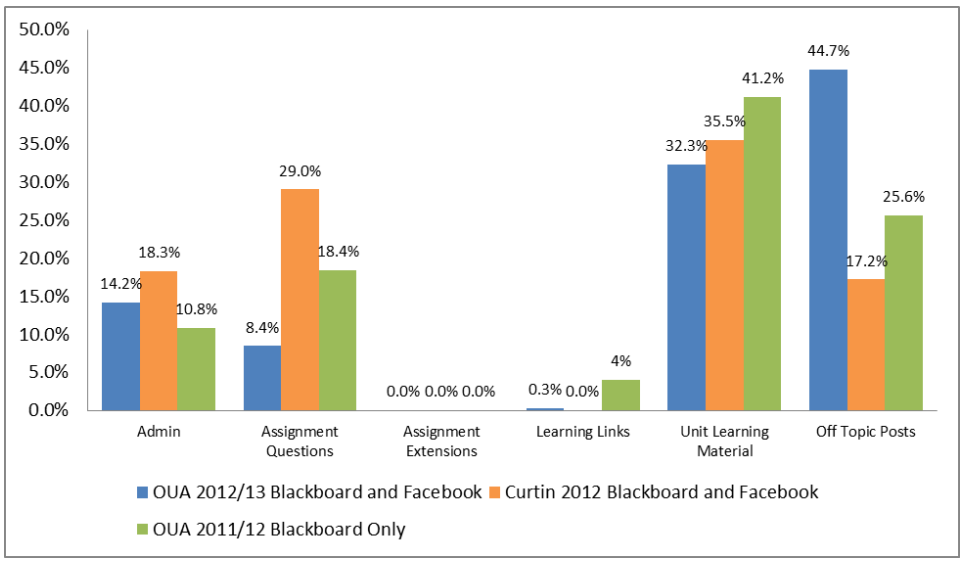

Fig. 7. Post topic blackboard only

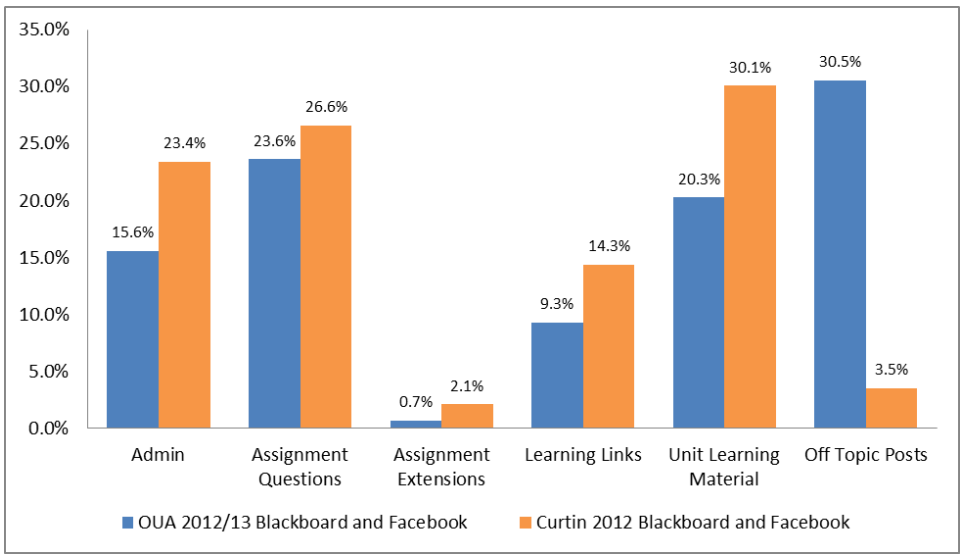

Fig. 8. Post topic Facebook only

Once all forums used for student dicussions are combined, as illustrated in Fig. 9, a number of features become noticable. The use of the Facebook group as a means of communications highlights the posts in topics such as admin questions, assignment questions, and to a lessor extent assignment extensions. The use of Facebook also facilitates the addition of learning links – other material related to the unit, but not a set part of its content – that was being brought into online discussion. This growth in

administration questions and assignment questions and the addition of learning links through a Facebook group was again reflected in the earlier study of Net 303.

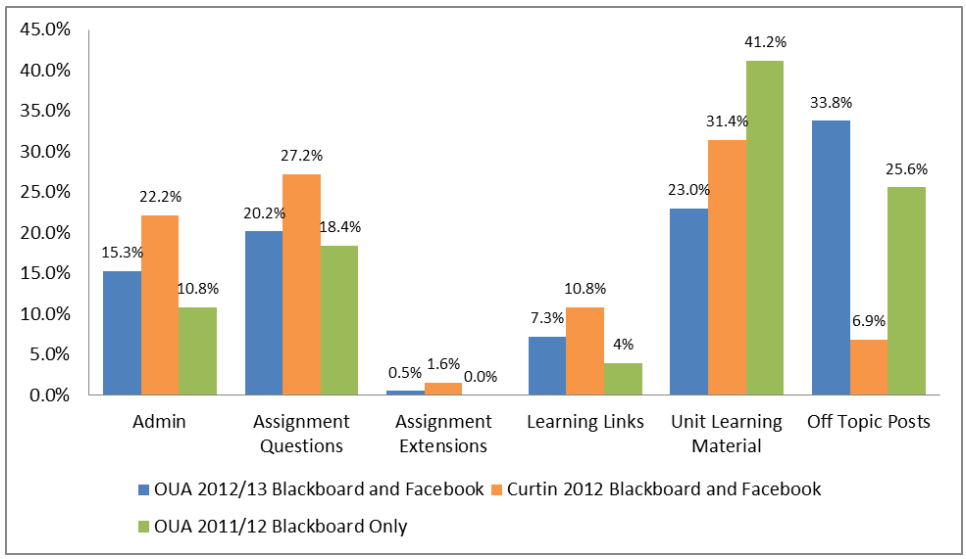

Fig. 9. Post topic all forums

The off topic conversation posts can play an important role in the development of a learning community and social capital. The relatively low number of posts by the Curtin students may be a reflection of their exisiting on campus network and opportunities for informal contact with other students. However if this category is removed from the analysis, as shown in Fig. 10, a much clearer difference can be seen in the content posted once Facebook is added as a forum for class discussion as can bee seen in Fig. 10 – with the Blackboard only group presenting a noticably different content profile to the two groups that used Facebook.

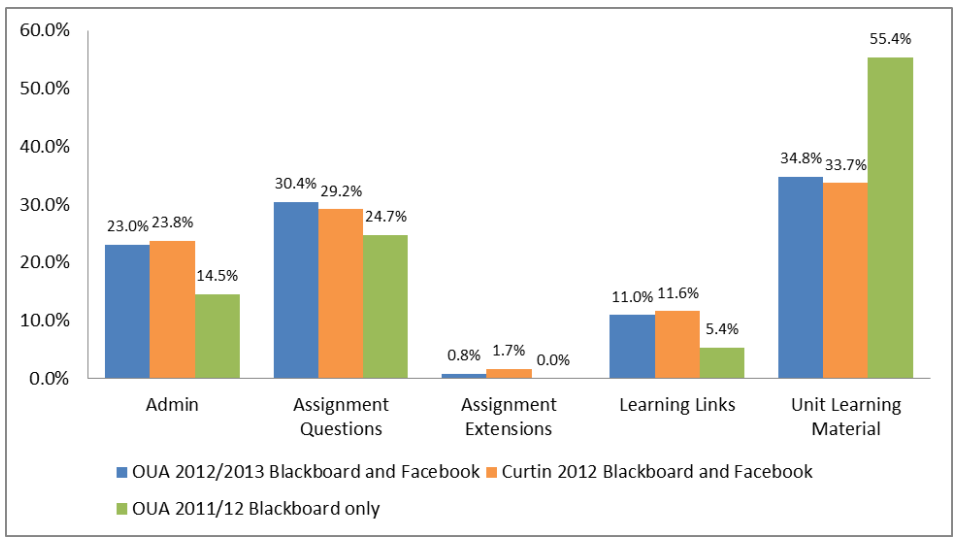

Fig. 10. Post topic all forums (off topic posts excluded)

4. Discussion

4.1. How Facebook was used by students and teaching staff

Some of the features of Facebook outlined in the background section were particularly highlighted through the study period for the 2012/13 OUA group. In this study period there were a number of severe storms across Australia, often resulting in significant flooding and power failures, conversely there were also a number of severe bushfires resulting in the destruction of homes and property and evacuations of local populations. A number of students were unfortunately involved in these events. The use of Facebook and mobile devices allowed both students and staff to remain in touch during this period. This allowed for actions such as staff to reassure students that strict deadlines would not be held for assessment for those involved, but also for students affected to share their experience and receive support through the community of the students and staff in the unit. With limited power and access to the Internet this sort of activity would have been difficult or impossible through Blackboards discussion forums, or more traditional email communications. As Dabner (2012) observes "social media can effectively support information sharing, communication and collaboration in higher education contexts, particularly in times of crisis".

Facebook also facilitates communications in relation to learning and teaching in the unit with discussions around assignments and administration well represented in the content of this forum. The affordance offered by the platform to easily link external links and content also helped to share additional information about the topic being studied, as can be seen in the greater use of learning links in this forum. By contrast the primary use of Blackboard was to engage in conversations around the unit's formal learning material, and this was less of a focus on the Facebook group. The longer posts were also more prevalent in Blackboard suggesting it is a better forum for students to engage in longer form more formal writing.

4.2. Activity

Schroeder and Greenbowe (2009) found that when they changed the discussion forum for their organic chemistry unit from the discussion forum on the WebCT LMS to Facebook the amount of student activity grew by nearly 400%. This study showed a similar increase of 439% in the number of posts to both Facebook and Blackboard from the Blackboard only class with OUA students, with the Blackboard only posts alone increasing by 22%. The Curtin students also demonstrated an increase of a more modest although still significant 59% in total posts compared to the earlier OUA group. It is unfortunate that there is not a direct like for like comparison available in this latter case. This suggests that it is wrong to think of the forums as competing, but rather that the Facebook group adds a level of student activity and engagement without impacting on the activity in the Blackboard forum adversely. Although there may more nuances to this, as the earlier Net 303 study did demonstrate a small decline in the number of posts on Blackboard once the Facebook group was added.

4.3. Length of posts

While the incidence of longer posts does not seem to have been impacted by the addition of Facebook to the unit's online discussion these longer posts were concentrated in the Blackboard forum, with fewer longer posts appearing in the Facebook groups. It is

unclear if these longer posts would have migrated to Facebook if that was the only forum available, or if the Blackboard threaded discussion lends itself better to students writing longer posts. Facebook was effective in eliciting a significantly higher number of posts under 100 words. This again suggests the value of using both forums to complement each other.

4.4. Content

With the exception of the larger number of off topic posts in the 2012/13 class there is a remarkable level of symmetry between the content distributions in each of the three Blackboard groups with different topics receiving similar levels of attention in each of the three instances studied. This is then again repeated in the two Facebook groups, although with a different type of symmetry. The higher levels of administrative and assignment question posts would seem to be a function of the value of Facebook as a tool to communicate, particularly the functionality observed by Karl and Peluchette (2011) and Phillips (2011). The increase in learning links may be a reflection of what Bateman and Willems (2012) observed that Facebook encourages peer teaching and resource sharing. Similarly Kayri and Çakir (2010) found that once Facebook was deployed as a learning platform lesson material was developed by students and learning was shaped by students. As McLaughlin and Lee (2010) note:

> *In the traditional tertiary education learning environment students are presented with resources that have been created by teachers, instructional designers or developers. They are then expected to have demonstrated that they have absorbed this material. We are now witnessing a growth in emphasis on content that is produced by the learners themselves.*

The relatively high number of off topic posts was a feature of both forums for the 2012/13 OUA class. While Selwyn (2009) notes that this type of post in Facebook is a recurring feature across a period of study, in this case it may have also been linked to the trying circumstances faced by some of the students over the study period. It could also be, as can be seen from the high number of week one posts in the Blackboard forum, that this was an unusually communicative class.

4.5. Net 303 parallels

The findings of this case study have proved largely consistent with those observed in the earlier study of Net 303. This is significant, as both are dealing with relatively small student groups, so finding that these observations can be replicated in different groups studying different units, adds to the validity of these findings. However these finding should also be approached with some cautions.

4.6. Limitations

The design of this case study was not without certain limitations. While student and staff activity was measured in the Blackboard forums and Facebook groups these were not the only points of engagement for the unit. While the on campus Curtin students had a two hour face-to-face class each week, there were also other online avenues of interaction. The students and staff communicated via email and there were recorded audio and video files that were used to communicate from staff to students, and the use of the Diigo collaborative tool was worked into the unit's assessment. Staff and students also communicated at various times through online conferencing tools such as Elluminate and

through Twitter. How much the use of these channels impacted on the Facebook and Blackboard discussion is hard to determine.

The number of posts under 100 words, particularly on Facebook, was a very high proportion of student activity. It would have been informative to break this down further. A brief three or four word post, is quite different to a ninety word paragraph, it would have been useful to have more data on this level of posting. On the other hand the assumption that longer posts show a greater level of engagement with the learning material also needs to be examined in more detail. These categories were predetermined at the start of the study as noted above as part of the Human Research Ethics Committee approval process for this study and could not be retrospectively altered.

The division of the content of each post into six categories is also problematic. Notably the Assignment Extension content is a feature by its absence. Clearly students very rarely discuss these issues in class wide discussion forums. The off topic content could also benefit from closer analysis. Including students introducing themselves to the group, updates to local bushfires, and funny internet memes all in the same category does not provide a clear enough picture of student activity in different forums. The allocation of posts to each content topic was also inexact. When a student post a supportive comment such as "very interesting" it may not be making the same meaningful contribution to the particular content category as the post to which it is responding. Again these categories were pre-determined at the start of the study, although this does provide fertile ground for future research.

As well as the data collected there are some other aspects of this case study that needs to be addressed. The student being all third year or post graduate students in an Internet Communications unit may not be a good representative sample of the way the broader university students' population might interact with both learning management systems and Facebook. Similarly the teaching staff involved in the unit had a high degree of experience in online learning and teaching and this may have influenced these results.

A final caution is that this study only observed anonymised student activity data. As Phillips (2011) observed "without any input from participants, this research project is limited to what can be seen and inferred from the written messages". By only observing student activity this study can only infer what they were doing and why they were engaged in a particular pattern of activity.

5. Conclusions

As Wang, Chung, Park, McLaughlin, and Fulk (2012) have observed "Online Communities have been around almost since the dawn of the Internet". These types of forums have been widely used as part of formal online learning and teaching since they were deployed with the development of the major learning management systems in the 1990s. However as Stern and Willits (2011) note:

> *The concept of the LMS has not evolved sufficiently to keep pace with the changing landscape of academic technology, especially with modes of interaction and collaboration fostered by popular online social networks like Facebook and Twitter*

Perhaps as a response to this students have begun informally taking to social networks such as Facebook where, as Haverback (2009) found, "The students revealed that they used the Facebook group to discuss assignments, ask and answer questions,

bounce ideas off one another, post information they found, and support one another". This study reflected Haverback's observations, with students being observed to actively ask questions about assignments, discuss the unit learning material and bounce ideas around and share new information through learning links, as well as offer mutual support through their off topic conversations. While it is encouraging to see students taking the initiative to support their own learning this study shows that these forums can also be usefully deployed as a formal part of an online or blended unit in higher education.

The primary conclusion from this study is that the addition of a Facebook group greatly increases the level of student activity, both in the number of posts per student for the semester, but also the way that this activity is maintained over the full study period, rather than just in particular periods of time. These results support the earlier (Kent, 2013) study of Net 303 and the findings of Schroeder and Greenbowe (2009). They also demonstrated that students use the Blackboard discussion forum and Facebook quite differently. Blackboard is used less frequently, and the posts are focused primarily on the unit's set learning material. It is also the venue where students write the majority of longer posts. The Facebook group contained far more frequent, although often shorter, posts. Facebook was used to communicate about assignments and administration, as a venue for discussing set unit learning materials and topics, and also a place where students bring links to other relevant material they have found.

Adding Facebook to the mix of online technologies used in learning and teaching would seem to be of significant benefit. The addition of the Facebook forum does not significantly impact on the use of the Blackboard discussion forum by students. The addition of this forum did not cause a significant drop in the use of Blackboard, or the type, number or size of posts there. Rather it added a new forum, used in quite different ways. Gao, Zhang, and Franklin (2013) observed that threaded discussion forums such as those used in Blackboard and WebCT do not foster online discussions naturally. They suggest "integrating emerging technologies to address the constraints of the current environment". This study indicates that both types of forums provide different affordance. The Blackboard discussion provides a space where students are able to post longer posts that display and engage a greater depth of learning, and Facebook provides a venue where students are able to enable a more vibrant community of learning and are able to engage in peer learning and resource sharing. Crucially by adding Facebook to the mix of online forums it helps bring additional features to the learning environment that are less developed in its absence. This raises interesting questions of how, if both forums are to be used most effectively, should learning activity and content be divided and how staff time and resources can best be deployed for the best student learning outcomes.

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