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Online chat and chatbots to enhance mature student engagement in higher education

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ABSTRACT

Mature students transitioning into their first year of higher education face many difficulties that affect their motivation, participation and success. Their feelings of being disconnected from their peers and from their institutions are among the key barriers to the successful completion of their courses. Encouraging online student engagement among mature students to establish social connection with their instructors and peers can reduce their isolation and enhance their 'sense of belonging'. During the academic year 2020/2021, the Lifelong Learning Centre (LLC) at the University of Leeds in the UK, decided to pilot an online chat platform 'Differ' including a chatbot 'Bo' after it had seen a decline in the use of programme Facebook groups. To promote student engagement and monitor the Differ online communities, sixteen digital student mentors were recruited and trained. During the pilot, feedback was collected from students and student mentors. A mixed-methods approach was adopted to boost robustness through triangulation. Several forms of data collection methods were used: a mentimeter, an online survey, three focus group sessions and a semi-structured interview. This study sheds light on the different aspects of creating student-led online communities and provides recommendations on how to improve the uptake of students in the future.

KEYWORDS

Mature students; online chat; chatbots; peer engagement; sense of belonging; student-led online communities

Introduction

Focussing on lifelong learning and widening participation in higher education (HE) institutions to meet the growth of mature adults returning to education has reshaped the structure and culture of these institutions (Hubble & Bolton, 2020). In the UK, 'mature students' are those aged 21 or over at the start of their undergraduate degree course (UCAS Report, 2021 or over 25 years of age at the beginning of their postgraduate studies (Hubble & Bolton, 2020). Scholars have described them as adult learners (Clegg et al., 2006), students returning to study (Chesters & Watson, 2014) and independent students (Thomas & Quinn, 2003). In 2018/2019, mature entrants at UK universities represented 36% of all undergraduate students and 53% of all postgraduate students (Hubble & Bolton, 2020).

Mature students transitioning into their first year of HE face many difficulties that affect their motivation, participation and success (Carayannopoulos, 2018; Heagney & Benson, 2017). They are more likely to study part-time at all levels, to work in skilled employment and to drop out of their course after their first year (Hubble & Bolton, 2020). Their feelings of being disconnected from their peers and from their institutions, in addition to the challenges they face while managing their

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finances and family responsibilities, are among the key barriers to the successful completion of their courses (Heagney & Benson, 2017). This feeling of detachment can reduce their 'sense of belonging' and has been shown to lower retention at HE institutions (Mallman & Lee, 2017; O'Keeffe, 2013; Sun et al., 2016).

Encouraging online student engagement among mature students to establish social connection with their instructors and peers can significantly reduce their isolation (Heagney & Benson, 2017). The quality of relationships with instructors fosters the successful transition of students into their university study. This relationship, to be effective, must go beyond the formal elements of assessment guidance and lecture organisation to include informal elements of approachability, interest and enthusiasm (Peel, 2000). In addition, online peer interaction, especially for those who are studying remotely or do not have time to attend face-to-face events, is an opportunity to overcome social isolation and to offer each other course-related and personal support (Heagney & Benson, 2017). Therefore, student engagement in HE plays a prominent role in creating effective learners (Collaço, 2017; Troisi, 2014). Scholars have identified clear links between student engagement and other variables such as academic performance (Webber et al., 2013) and student retention (Kuh et al., 2008). Student engagement is defined by Trowler (2010, p. 3) as the 'interaction between the time, effort and other relevant resources invested by both students and their institutions intended to optimise the student experience and enhance the learning outcomes and development of students and the performance, and reputation of the institution'. Hence, it is a multidimensional phenomenon (Collaço, 2017) that measures the quality of the students' learning experience as a whole (Robinson & Hullinger, 2008).

The use of technology as a tool to promote student engagement has been shown to be successful in accelerating the achievement of students' learning outcomes (Chen et al., 2010; Robinson & Hullinger, 2008) and in creating online learning communities that can foster students' collaborative efforts (Benbunan-Fich et al., 2005; Robinson & Hullinger, 2008). Student collaboration or peer tutoring is identified as an important element that can contribute to enhancing student engagement and motivation in The National Survey of Student Engagement (NSSE) which is based on the widely cited Seven Principles of Good Practice in Undergraduate Education by ; G. D. Kuh, 2003). It has been proven to be an effective learning technique by Benbunan-Fich et al. (2005) and Robinson and Hullinger (2008). In addition, online learning communities can facilitate providing prompt feedback to students which can mitigate feelings of isolation and detachment (Schwartz & White, 2000) and increase their sense of belonging which is vital for their success (Pearson, 2012).

A chatbot is 'a conversational agent that interacts with users using natural language' (AbuShawar & Atwell, 2015. Chatbots have many uses for natural human-computer interaction (Abu Shawar & Atwell, 2007; Atwell, 2005). In most western countries, online chat platforms and chatbots are increasingly being used in HE to boost student engagement (Studente et al., 2020) and academic performance (Pérez et al., 2020). This paper reports on a small-scale study, exploring the impact of using an online chat platform 'Differ' (Differ, 2021) that has a built-in chatbot 'Bo'; Differ and Bo were examined in relation to enhancing mature students' engagement and sense of belonging in the Lifelong Learning Centre (LLC) at the University of Leeds in the UK. The LLC is a multidisciplinary centre, running courses in social sciences aimed at part time and mature students, as well as Foundation Years in Science, Business and Arts and Humanities. The decision to pilot Differ was made after the LLC had seen a decline in the use of programme Facebook groups. Some students had set up WhatsApp groups but this sometimes left other students feeling more isolated and excluded. There was a need for an online platform for all students to connect during their transition into the university. In addition to these specific trends in online interaction within the LLC, the Covid-19 pandemic caused a rapid shift to online teaching and learning in Higher Education institutions across the world (Karakose, 2020; UNESCO, 2021). This placed an additional pressure on students who were starting courses which had originally been designed for face-to-face teaching. As well as negotiating transitions into Higher Education study, new students had to quickly develop knowledge of university IT systems and teaching platforms and to engage with online learning contexts, without the opportunities to meet with other students in social spaces. The

local and global contexts made the introduction of a platform to facilitate peer interaction online particularly timely and emphasised the importance of prioritising accessibility when choosing which platform to use. It was felt that Differ was an inclusive option designed with university students in mind that all students could access. The use of Differ has boosted students' sense of belonging and has facilitated student engagement with peers.

Considering the paucity of research on the impact of using chatbots and creating student-led online communities in HE, this paper contributes to the literature of mature students in HE by drawing attention to the role that online communities can play in boosting students' sense of belonging and reducing feelings of detachment. Determinants and barriers to students' successful interactions in these communities are discussed. Furthermore, this study highlights the significance of the recruitment, screening and training of digital student mentors to support and safeguard these online communities. Finally, recommendations on how to enhance student engagement with their peers in their online communities are presented.

The use of chat or mobile instant messaging (MIM) tools in HE

Students' familiarity with texting in their personal lives has enabled the use of many MIM tools like WhatsApp to be widely used in HE to enhance social presence (Tang & Hew, 2017), peer support (Timmis, 2012) and to promote communication and collaboration (Nitza & Roman, 2016). WhatsApp is the most popular MIM platform used to foster learning in HE (Panah & Babar, 2020). The authors argue that the most dominant function of WhatsApp is its capability to facilitate student engagement with their peers anytime anywhere. In addition, the integration of text, video and audio into a user-friendly interface makes it fairly simple to send messages with no cost (Tang & Hew, 2017). Generally, studies examining the use of WhatsApp in education have focussed on studying three ways of communication: instructor-learners, learners-content and learner-learner dialogue. Panah and Babar (2020) conducted a survey of the studies that used WhatsApp in education. The authors recommend that instructors should use MIM tools such as WhatsApp for learning as they can expand students' knowledge through interaction, sharing and developing interpersonal skills.

Gronseth and Hebert (2019) have conducted an exploratory case study which examined students' interactions in online student groups created on GroupMe (an MIM tool) in a public university in the US. This study reported on the productive course-related conversations among students and its positive correlation with the depth of discussions. Peer support cannot be separated from learning as it plays a vital role in understanding of learning as a social activity (Timmis, 2012). Peers provide not only affective support but, as Vygotskiĭ and Cole (1978) argue, can facilitate learning. Vygotskiĭ and Cole propose the 'Zone of Proximal Development': as the cognitive 'space' between what a learner knows or can do as an individual and what can be accomplished with the support of more able peers. In the current study, there was no subject input from tutors and so any learning support was provided through dialogue with peers via the MIM application Differ.

The use of chatbots in HE

Within HE, there is growing interest in using chatbots to provide efficient and timely services to students (Pérez et al., 2020) and to enhance student engagement (Studente et al., 2020). In some cases chatbots may be introduced as a way to reduce costs related to student administration. Chatbots can be categorised into either teaching oriented or service oriented (Pérez et al., 2020). Teacher oriented chatbots aim to relieve the workload of teachers by acting as teaching assistants, reinforcing learning of students through generating knowledge like a human tutor (Pérez et al., 2020). An example of teaching oriented chatbots is Coding Tutor (Hobert, 2019) which supports university students in writing software code and getting an automatic assessment of this code during their study of introductory programming courses. Other teacher-oriented chatbots developed to promote language learning, e.g. Bookbuddy (Ruan et al., 2019), Clive Chatbot (Zakos & Capper, 2008) and Mobile Chatbot (Pham

et al., 2018). Furthermore, Sjöström et al. (2018) proposed a conceptual architecture for teaching-oriented chatbots in higher education. The study outlined several chatbots design considerations, among them, the authors emphasised the importance of developing chatbots in platforms that students and educators are familiar with and can easily access (i.e. Facebook Messenger) In addition, the use of the chatbot Hubert.ai (Edubots Project, 2019) in collecting course feedback from students in HE has been shown to have a positive impact on students' response quality and on boosting their enjoyment levels (Abbas, Pickard, Atwell and Walker, 2021). Winkler and Söllner (2018) shed light on the importance of conducting further research on the long-term effects of using educational chatbots on both the learning processes and the learning outcomes.

Examples of service oriented chatbots are those that answer students' questions about timetables, grades, tutors, societies, clubs and so on, such as Ask L.U. (Lancaster University, 2019) and Ada (Bolton College, 2019). Other service oriented chatbots can assist students in the various services offered by universities that promote student engagement in the learning process and introduce new students to their peers; Differ was designed to be used for these purposes (Differ, 2021).

Furthermore, a recent research study by Studente et al. (2020), reported on the use of Differ (the platform adopted in this study) to enhance student engagement in a small (around 3,500 students), private, not for profit university in London during the Autumn term of 2019. Peel (2000) and Studente et al. (2020) have identified several causes of low engagement in university life, which often leads to higher dropout rates. Although there is a twenty years gap between the two studies, they both confirm that feelings of loneliness and isolation are among them. 90% of Studente et al.'s study are international standard age students. With these students, feelings of isolation tend to be intensified due to challenges of cultural adaptation (Ellis, 2019). Hence, the use of Differ in their study boosted student engagement and has eased their transition into their first year of university study (Studente et al., 2020). Using Differ, four online learning communities were created to facilitate student discussions with their peers and with their programme leaders (Studente et al., 2020). Previous research such as Goggins and Xing (2016) suggests that the number of posts students write in their online discussions correlates positively with their learning performance. Studente et al. (2020) report positive correlation between engagement with peers and study engagement. Moreover, students found the chatbot or the chat platform to be helpful in connecting with their programme leaders and generally in getting the support they needed.

The study

The Lifelong Learning Centre (LLC) at the University of Leeds has a diverse student body and a variety of programmes from foundation years to part-time degrees. As mentioned above, there was a need for a safe online community for all mature students to connect with their peers and the Covid-19 pandemic exacerbated this need. To use Differ, students do not have to share any personal details or telephone numbers with their peers; this was seen as an advantage over general social media platforms like WhatsApp and Facebook. In addition, it facilitated the creation of staff-free student-led online communities with the potential to create a sense of belonging and provide peers support for learning. All new LLC students, all returning LLC students and undergraduate mature students in faculties across the University were invited to use Differ. The following steps were undertaken to set up the new online communities and to promote student engagement:

1. Recruitment of Digital Student Mentors (DSMs)

In July 2020, the LLC advertised the HEAR[1] (The Higher Education Achievement Report) accredited role of DSM by email. Sixteen DSMs were recruited, representing each programme and both standard age and mature students. A DSM community on the Differ application was set up and all DSMs were asked to join. This community was used by all the DSMs to communicate with each other and to ask questions of the staff. Two online training sessions were delivered to the DSMs at different times to ensure that all DSMs could attend.

These sessions were recorded and shared in the DSM community for reference along with a handbook with useful resources to help them perform their role. The handbook listed all the transferable skills that the DSMs would develop during their roles: general guidelines on how to professionally handle spamming, fake news and trolling in their communities; a list of Dos and Don'ts; potential challenges and how to overcome them; contact details for LLC staff and information about the available support for students at the university.

2. Holding weekly planning meetings with the DSMs

Weekly planning meetings were held with the DSMs to help move the project forward and to get their perspectives on the progress of the project. Furthermore, these meetings gave the DSMs the opportunity to generate ideas and to exchange experiences with each other about the different communities. Hence, DSMs felt they were supported and were able to give direction to those that felt they needed it. Google Jamboards were used to share ideas in these online meetings which were held on Microsoft Teams. Figure 1 shows an example of a Jamboard from the first planning meeting which was used to brainstorm ideas about how to get conversations started in communities.

3. Creating and inviting students to the communities

Unless students were on a foundation year, they would generally be invited to join a minimum of three Differ communities: a community for all LLC students, one for each year group (multi-disciplinary) across programmes and one community for all years on each programme (discipline specific). These spaces did not have tutor presence in order to separate the chat space from formal academic spaces. This aimed to create safer spaces where students would feel comfortable talking to their classmates and to learn from other year groups and students from other programmes.

In September 2020, links to communities were emailed to students to invite them to join Differ. All new LLC students who had successfully completed Kickstart (the pre-entry academic skills programme) were invited to join Differ three weeks before the start of the academic year. We hoped this would give new students enough chance to become familiar with the platform and have plenty of time to ask questions prior to starting on their programme. LLC students going onto level 2 & 3 of their degrees were invited to join Differ two weeks before

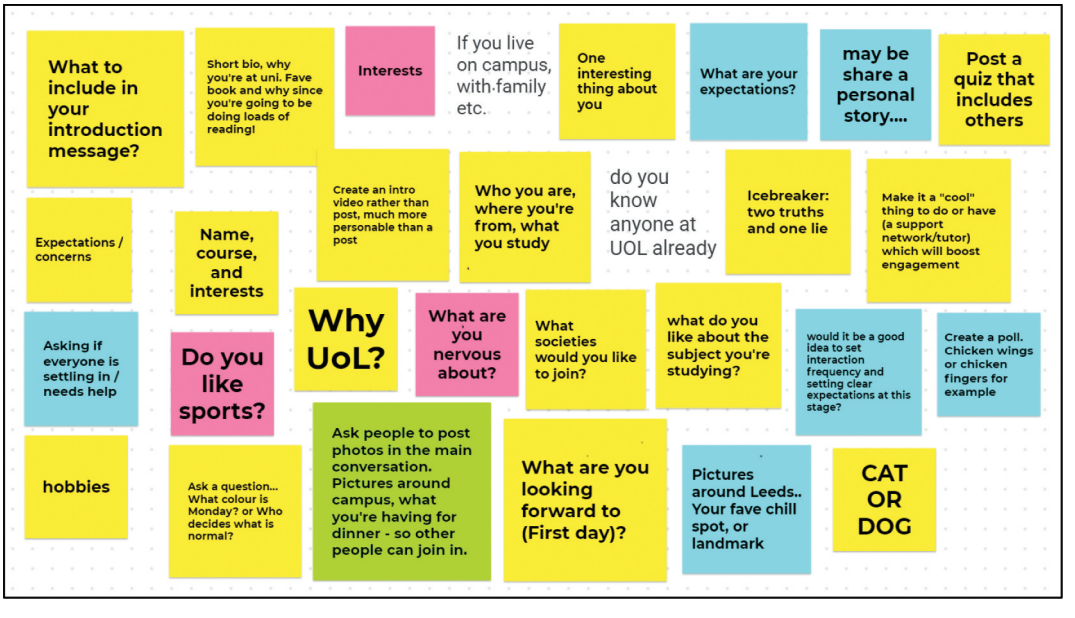


Figure 1. A Jamboard from the first planning meeting.

the start of the academic year because many of these groups already had established ways of connecting online. Mature students outside of the LLC in faculties across the institution were invited in induction week once their contact details were obtained.

4. Speed friending

To promote student engagement with their peers, the built-in chatbot 'Bo' which is part of the Differ application was used as a hybrid ice breaker. 'Bo' introduces students to each other and offers to answer their questions. The DSMs used this feature to run some icebreaking events in their communities to help members meet each other. These seemed to get quite a good response rate, but some students stated that they did not get paired with anyone or if they did, the other person did not respond to the icebreaker. This feature was also used to run a couple of 'Speed friending' events. Students had to join either the 'Speed friending' or 'Speed friending for foundation year' community then, on a Friday at 8pm, go onto Differ and ask to be introduced to another student. 'Bo' would then pair students and start the conversation.

Methodology

This pilot study adopts an exploratory mixed-methods approach to examine the impact of using chatbots in HE and creating student-led online communities. Considering the paucity of studies in this field, early exploratory studies are essential to enrich the concatenated exploration over the course of several exploratory studies (Stebbins, 2001). Nevertheless, early exploratory studies can suffer from weaknesses in generalisability, validity and sampling as argued by Stebbins (2001) but their cumulative knowledge can advance research from the exploration stage to the confirmation (Stebbins, 2001). Although this pilot is a small-scale study with a small sample size, it is sufficient to draw exploratory results that can guide further research in this field. In addition, the use of mixed-methods approach in this study aimed to achieve 'initiation' (Greene et al., 1989) where different data collection methods are used to understand the patterns of interaction in online student-led communities.

The study took place from July 2020 to December 2020. Several forms of data collection methods were used: a mentimeter, an online survey, three focus group sessions (two with mature students and one session with the DSMs) and a semi-structured interview with the LLC staff leader who monitored the online communities on Differ.

Following induction week in September 2020, (nearly three weeks after students started to use Differ), a mentimeter link was posted to the different online communities. It asked students to complete the sentence: 'The Differ Chat app is . . . .'. Twelve students sent their responses as shown in Figure 2 in the results section. By mid-October, a newly developed 15-item survey was distributed to students at the LLC to ascertain their opinions on having used Differ over the autumn semester. The survey response rate was 21% (27 responses). The survey responses were analysed using MS Excel filters and pivot tables. Table 1 and 2 show respondent's areas of studies at the university.

The online survey consisted of four sections; collecting information about the degrees that students are enrolled in, their opinions about HE before joining the university, their feedback after using Differ and their suggestions on how to use Differ in the future. The survey questions were a combination of open and closed questions.

In the online survey, students were asked to provide their email addresses if they were willing to take part in the focus group sessions. In addition, an email was circulated to all users of Differ inviting them to take part in the focus groups. A £15 voucher was offered to participating students. Seven students participated in two sessions. Each session lasted for an hour and a half. Another focus group session was held with the DSMs, 'meta-level experts whose service the chatbot will be replacing or augmenting' (Atwell et al., 2000). This session was attended by five mentors and lasted for an hour and a half. All three sessions were hosted on Microsoft Teams and were video recorded. Thematic analysis was undertaken to analyse the collected feedback. All themes are presented in the

Figure 2. A mentimeter of students' choices for ending the sentence.

Table 1. Survey Responses.

Responses	
Foundation Years	4
Part-time	18
Full-time	4
Total	**27**

Table 2. Survey responses participants grouped by their year of study and course.

Course	No. of Students
1st Year	24
Arts & Humanities Foundation Year	1
Child and Family Studies	4
Preparation for Higher Education (PHE)	13
Professional Studies	2
Science Foundation Year	4
2nd Year	1
Professional Studies	1
3rd Year	2
Child and Family Studies	1
Professional Studies	1
Total	27

results section. In addition, a semi-structured interview was conducted with the LLC leader who monitored the online communities. This interview was an hour long and was held on Microsoft Teams, video recorded and transcribed. Thematic analysis was used to identify key characteristics and patterns of students' interactions in online communities.

Results

Quantitative data analysis results

The data presented in Table 3 reveal that Differ has been used by many students to connect with their peers. Goggins and Xing (2016) argue that the number of posts students write in their online discussions is often correlated with their learning performance. Results collected from the online survey reveal that 63% of the respondents found Differ useful and 59% would recommend Differ to their friends. In addition, 96% of students have reported being committed to completing their studies at the university and 70% of them have been anxious about starting university life. Chart 1

shows how students felt before using Differ, chart 2 shows their responses to Differ and chart 3 shows how Differ has affected their feelings about starting university.

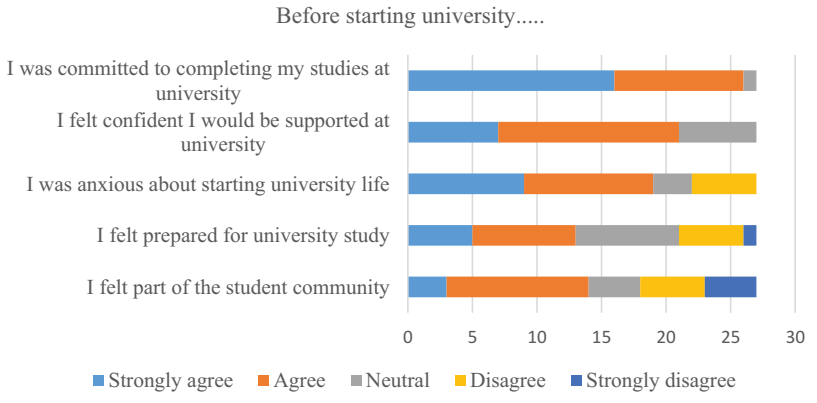


Chart 1 Students' views before starting university.

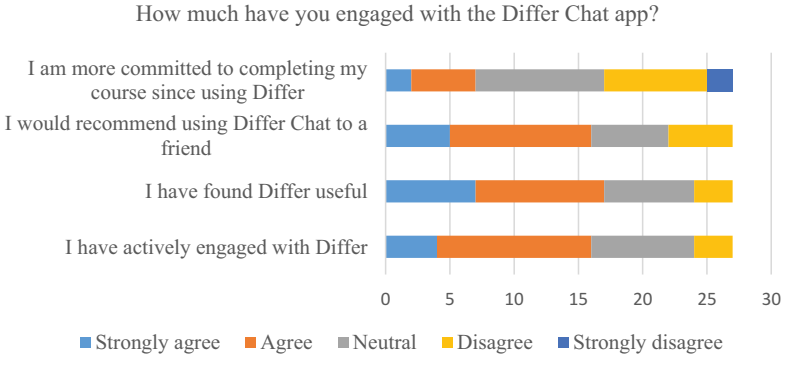


Chart 2 Students' responses on their use of Differ.

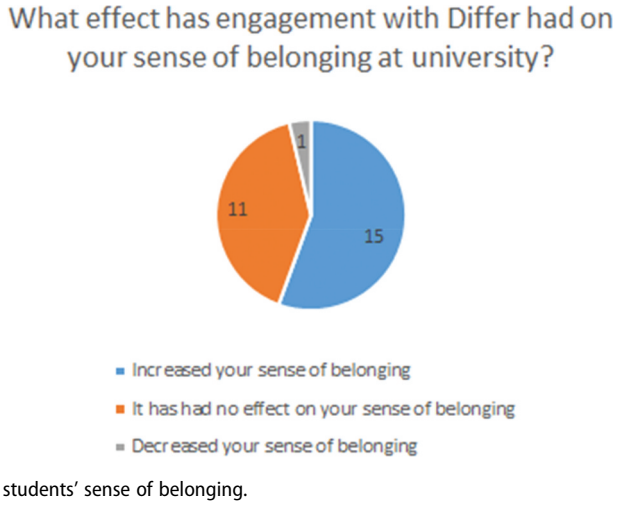


Chart 3 Effect of Differ on students' sense of belonging.

Table 3. Differ Use Statistics.

LLC students invited	650+
Undergraduate mature students invited	3000+
Total Students joined	280+
Mature students joined	127
Differ accessed/opened	24,600
Total number of Messages	8,860
Users who started an icebreaker	55%

Qualitative data analysis results

A mentimeter link was posted to the various online communities on Differ to collect students' feedback after three weeks of Differ's introduction. These responses were generally positive as shown in Figure 2.

'The Differ Chat App is . . . '

Digital Student Mentors' (DSMs) Feedback Themes

The DSMs enjoyed using their experience to help others and could see how their role was relieving students' anxieties about starting university. One DSM stated that:

> *'Loved the concept, like the mentor element gives it some kind of framework for engagement that WhatsApp doesn't have. I did have a few positive interactions with people that felt a bit wobbly, it was nice to be able to help,'*

(Digital Student Mentor)

The online communities were monitored by the LLC staff leader and the DSMs. By the end of November, the chat activity on Differ reduced and the DSMs reported that students had found new ways to communicate. It had been expected that this would happen once students had been introduced and teaching had begun. The LLC responded to the decline in activity by posting a message informing students that the communities would no longer be used, but the direct messaging service would still be available. The Preparation for Higher Education (PHE) community was still very active and following feedback from students, it was decided to keep this community open even after the completion of this study.

In addition, DSMs stated that sometimes interactions felt forced and were not as organic as they thought. There was a general feeling that it was sometimes hard to get the conversation started. They also felt that they may have been trying to be too supportive at times and that this got in the way of having fun.

Generally, the DSMs in communities involving new mature students felt that the platform was a great way of making those initial connections before moving onto another platform such as WhatsApp. Some mentioned that WhatsApp felt 'crazy at times' and that it was nice to have something separate for university life. One student stated that Differ allows interaction and that the functionality that other platforms do not have, helped with existing mental health conditions. It appeared that the standard age foundation year students moved quickly from Differ onto more familiar platforms such as WhatsApp but did use Differ to connect initially. The platform also worked better for incoming students rather than current students who commonly had other ways of communicating already in place.

> *'It helps with connecting with each other especially in the initial stages. It helps you get information concerning your course or social activities on-line. l would have wished to use it more but we are so occupied with studies, so once in while is still needed,' (First year, PHE student)*

The DSMs felt that they knew what was expected following the online training sessions and that the Differ community for DSMs helped them feel supported. They also messaged each other privately for advice and help. All DSMs agreed it was useful to have the handbook and to know it was there, but no one used it once the role started. Moreover, all DSMs agreed that Differ should continue to be used but there was room for improvement. Some thought that the application looked dated and that there

were glitches when it came to notifications and announcements. Nevertheless, this problem was reported by few students. This impacted on how responsive the DSMs could be in their role. Mixed feelings were reported about the chatbot 'Bo', some mature students found it patronising and childlike.

Foundation years students' feedback

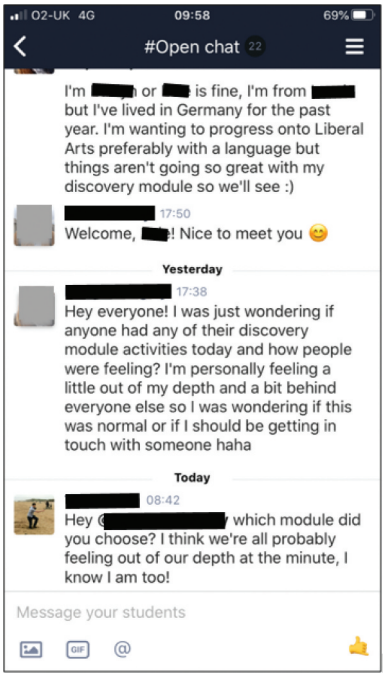
Some students missed the Differ application joining information because they were receiving so many emails from the university. Once they joined Differ, via either a recommendation from a friend or seeing the email, they felt they were a bit late and the community had quietened down.

Many foundation year students joined Differ but after an introduction they quickly created WhatsApp groups. All these students could see the benefit in having Differ for making those initial connections. Foundation year students preferred WhatsApp for its familiarity.

One of the features that was found useful by many students is Differ's separate tab for files and links which are saved from the community chat. Students found this really helpful when it came to looking back for resources rather than having to search the chat thread.

New mature students' feedback themes

Many mature students said they felt more comfortable asking questions online than they would have done in a face to face setting. Preparation for Higher Education (PHE) students really benefited from the supportive space on Differ and felt reassured by how easy it was to ask questions without feeling they are being judged. In addition, they liked how they could ask questions at any time of day or night and they would be answered by someone. They felt connected to each other and could be themselves. Screenshot 1 shows how students used Differ to ask questions and make connections.



Screenshot 1 A Conversation Screenshot from the Arts and Humanities Foundation Year Community.

One student had issues waiting for their unconditional offer to be processed and said that Differ really helped them get answers to questions whilst waiting for the university account to be activated. It made a positive difference to the first few weeks and put the student at ease.

One mature student had met their peers using Differ and had to go onto campus to collect their ID card. This student felt reassured knowing there were other mature students on Differ when only seeing standard aged student on campus. The student described how they felt part of 'a community online'.

Some students found the chatbot 'Bo' annoying and confusing. Quite a few students had an issue with the chatbot repeatedly on-boarding when joining Differ rather than going straight to the home screen. Some were unsure about the icebreakers and the questions the chatbot asked. One student said that once they got used to it, they could see its purpose.

Some students were unaware that there were DSMs in the space. The PHE group, in particular, found their DSM useful and felt they could ask questions and get a quick response. Students generally said that DSMs felt part of the community and there was no feeling of 'us' and 'them'.

Students could see the benefit of Differ for certain groups but often they would use other platforms for different purposes. Generally, WhatsApp was preferred for communicating once peers had been located on Differ. For group work, students used either WhatsApp or Microsoft Teams because of the video feature. Students used email or Teams to communicate with tutors. They also mentioned that they like to use Differ to keep their personal and university life separate and that sometimes WhatsApp has too many notifications and can be overwhelming. They also recognised that Differ was probably preferred by mature students.

'I tried to use Differ but can become overwhelmed by the amount of activity on there, as well as WhatsApp groups and email communications,'

(First year, Child and Family Studies student)

Many students were unaware of the option to create their own communities and topics. Some were not aware of the 'ask a question' feature. Generally, the feeling was that they did not know they were allowed to use any of the additional features and some lacked confidence in exploring new technology.

On the other hand, some students who were more IT-confident set up seven more communities. This included a mature students' community, a well-being community and a music club. The Science Foundation Year students chose to add a Physics and Biology community and the Preparation for Higher Education (PHE) created a community for each of their modules in the Data Handling and Information Literacy degree.

Some students suggested that if Differ had been part of the University's systems it would have encouraged them to use it more.

'Differ should always be the platform for discussions,'
(First year, PHE student)

'Include more events to get people talking. Making the first step was the hardest so something to make that easier,'

(First year, Science Foundation Year student)

Current students' feedback themes

Generally, current students liked the different features of Differ but could see it having more benefit for the new students. Current students already had ways of communicating with their peers. Some current students did join the Speed Friending activity for a chance to meet new peers. They also felt that Differ was an additional piece of IT to get their head around and those who struggled with technology were reluctant to use it.

Discussion

This study sheds light on the positive impact of creating student-led online communities to enhance mature students' peer engagement and boost their sense of belonging. The commitment and motivation of mature students to the completion of their studies have been shown to be remarkable compared to standard age students by Seager (2017). This also confirms Knowles (1984) andragogy

assumption that intrinsic motivational factors inspire adult learners to learn as they mature. Nevertheless, scholars have argued that mature students' feelings of anxiety can be attributed to their feelings of being isolated and socially out of place which can lead to their feelings of being dislocated from their institutions (Mallman & Lee, 2017). A student body can be seen as a 'Community of Practice' (CoP) with behaviours, language and norms that newcomers have to learn. As Lave and Wenger (1991) demonstrate, new members learn the ways of a CoP through 'peripheral participation' – observing established members and gradually moving into the centre of the community as they become more experienced. This process can be particularly difficult for mature students who often have perceived feelings of being 'isolated learners' which can ultimately affect their engagement, motivation and persistence (G.D. Kuh, 2009). The challenge of facing competing roles and demands often hinder them from participating in university culture and experiencing social integration (Mallman & Lee, 2017). It could be argued that the way students used Differ challenges the notion of 'peripheral participation' but the MIM provided a peripheral space in that it is not a central part of university life and was used to support incoming students. This peripheral space enabled new students to learn from established members of the student body and shows that creating safe online communities on MIM applications such as Differ can mitigate feelings of anxiety and enhance community integration.

In particular, part-time mature students are less likely to engage with their peers and to participate in university events and socials as they might have family responsibilities and/or work long hours in paid employment (O'Keeffe, 2013). These reduced levels of engagement can negatively influence their sense of belonging which is a key component for their success (Pearson, 2012). In the LLC, mature students doing the Preparation for Higher Education (PHE) part-time foundation year found the use of Differ useful in connecting with their peers and have continued to use their online community in their second semester; following the completion of the pilot in December 2020. In addition, the survey responses reveal that students who reported engaging with their peers using Differ have claimed to experience an increased sense of belonging. These findings are in line with previous research which argues that social and peer integration/support correlate positively with higher retention in HE (O'Boyle, 2014; Tinto, 1997; Wilcox et al., 2005) and that they are critical to the development of students' sense of belonging especially those transitioning into their first year of study (Erb & Drysdale, 2017).

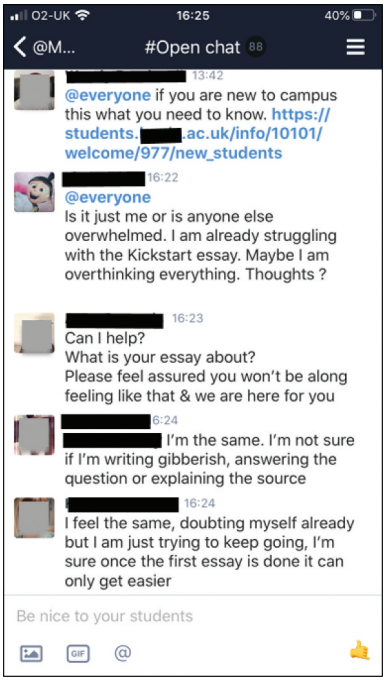
Determinants of successful uptake of differ at the LLC

The key findings of the study indicate that standard age students and mature students have appreciated the benefits of using Differ for making the initial connections with their peers. Foundation year students have found the weekly speed friending events which are run on Fridays at 8pm, via the chatbot 'Bo', helpful in getting matched to their peers. However, shortly after making these initial connections on Differ standard age students have moved to WhatsApp for its familiarity and for the video call feature.

Many mature students stated that they found the online communities on Differ to be safe places for them to ask questions anytime anywhere without being judged. Online safety and data sovereignty are significant issues with regard to digital social media. Concerns include 'fake news' (Tandoc et al., 2018) and 'filter bubbles' (Bozdag & Van den Hoven, 2015; Flaxman et al., 2016). As Reviglio and Agosti (2020) point out, users of social media 'pay' with their data to use the digital spaces. In order to maximise user engagement, social media companies use algorithms to personalise the experience which leads to the 'filter bubble' in which people are fed content that fits with material that they have previously consumed. This includes political content that may be distorted or even untrue ('fake news') which is amplified by the filtering process whereby a user who watches, for example, a political video, will be fed more of the same. Van Dijk (2020) argues that older and more highly educated users may be more skilled and managing and interpreting content. One of the

ways in which this may happen is that these users may be more wary of social media platforms, especially those such as WhatsApp which are owned by mega corporations. Using a small-scale MIM such as Differ can help to allay these concerns.

In addition, instant messaging conversations are characterised by their continuity over long periods of time allowing participants to drop in and out as they need (Timmis, 2012). This has helped students to feel connected to each other and to be themselves. Many of them favoured having separate MIM applications like Differ for university chats only. Students found that connecting with their peers on Differ has made a positive difference to the first few weeks and has put them at ease. Screenshot 2 reveals that 'grounding', by which students can develop mutual trust, shared understanding and goals that facilitate collaboration (Clark & Brennan, 1991) took place among PHE students through the acknowledgement of understanding, sharing of anxieties, feedback on ideas and feelings. Indeed, during the focus group sessions, many students stated that after using Differ, some students went to face-to-face study groups where they realised that they have met somebody on Differ and they started to form face-to-face conversations more comfortably.



Screenshot 2 Conversation example from the PHE community.

The recruitment and training of sixteen Digital Student Mentors (DSMs) was regarded as vital to promoting interactions on the online communities by both mature students and the DSMs. The purpose of the DSM training is twofold: to facilitate the screening and selection of the best mentors, ensuring that the ones recruited can provide appropriate support and to equip them with the necessary skills and knowledge for their roles. As the university did not pay these mentors for the time and efforts they have spent in mentoring, the accreditation of this role by HEAR has meant that their commitment and hard work is recognised in their degree transcripts. In addition, as DSMs are students in the programme that they are mentoring, they felt they were able to make a difference and to use their experiences in answering their communities' questions and to relieve students' anxieties when starting university. Mature students have reported finding their DSMs supportive and have felt part of the community. This confirms previous studies that have highlighted the benefits of mentoring for the mentors as being able to support other students and developing connection and friendships (Colvin & Ashman, 2010).

Moreover, the DSMs felt supported in their roles as they attended weekly planning meetings with LLC leaders which gave them the opportunity to generate ideas and exchange experiences with other DSMs about the different communities. These meetings have facilitated collecting feedback about the progress of the project and responding promptly to the issues that are reported by the DSMs. Furthermore, the DSMs have had a discrete online community on Differ to connect with each other. This community had links to recordings of the online training sessions and a link to the handbook with detailed information about their roles, how to professionally mentor their communities and overcome any challenges. Despite minimal use of these resources, the DSMs have emphasised the importance of knowing that these resources are available if needed. Providing mutual benefits for mentors and mentees is vital for the success of the programme (Chuang et al., 2003).

Barriers to differ uptake at the LLC

One of the challenges of using MIM tools such as WhatsApp and Differ chat is the application notifications which can become disruptive to other activities as reported by Gronseth and Hebert (2019). In this study, many students reported finding Differ notifications and announcements sometimes overwhelming. As some students were unable/unaware of how to mute the notifications, they ended up uninstalling the application.

This is in line with previous research conducted by Tang and Hew (2017) and Gronseth and Hebert (2019) who recommended that instructions on how to mute notifications should be provided to students to avoid student resistance to using the application. Applications that are easily accessible and mobile friendly can foster student engagement and offer a safe place for students to form other groups with their peers who share the same interests and/or similar programmes of study (Gronseth & Hebert, 2019). Student engagement with their peers on MIM groups has been shown to enhance students' academic achievements and their satisfaction (Nitza & Roman, 2016).

In addition, feedback from the students shows that they were not aware of the various features of Differ and some lacked confidence and/or IT skills in exploring the space on their own. Van Dijk (2020) points out that there are generational differences in how digital technologies are used and that, whilst Prensky's (2001) notion of digital natives/immigrants is not supported by subsequent research, older users may be less proficient at what Walker and White (2013:8) call 'procedural competence' (understanding, for example, which 'buttons' to click). This explains why mature students might not have confidence to explore features of the tool such as creating their own communities. Future students' training should aim to provide clear instruction on the features of the application and how this can benefit them compared to other platforms. Examples of these features are the 'ask a question' feature, which can be done anonymously, and using icebreakers to meet new people. Creating a positive user experience through technology training can have a positive impact on student beliefs about the usefulness of applications (Bhattacherjee et al., 2018).

Conclusion

In this study, using Differ to assist students with social integration had a positive impact among standard age and mature students by facilitating the formation of initial connections with their peers. This enhanced PHE part-time students' sense of belonging and engagement with other PHE students. The survey responses show that 59% actively engaged with Differ, 63% found Differ useful and 59% would recommend Differ to a friend. A key finding of this study is that Differ is particularly appropriate to boost student engagement among non-standard student cohorts, for example, International students joining the Summer School, or students enrolled in interdisciplinary programmes. In addition, the DSMs recruitment, screening and training processes are important for the success of student-led online communities as DSMs can professionally monitor, and safeguard the online communities and initiate conversations. Tang and Hew (2017) recommend

setting norms and rules for these communities to maintain safe spaces for students to communicate. Moreover, having a separate MIM tool for university use only can help students draw the line between their student life and their private life as this study reports and as found by Tang and Hew (2017).

To improve the uptake of Differ in the future, applicants will be invited to join Differ in the pre-entry academic skills programme (Kickstart), once they have attended a live session over the summer. This will provide a method of keeping in touch, and connecting with peers, rather than waiting until September. In addition, as some students experienced confusion over which communities to join and missed the email invitations, students will be invited using SMS which should make their joining experience smoother. Also, the LLC will design a training programme for new students that provides clear instruction on how to create new communities and on how to use the 'ask a question' feature to find peers, to make it easier for students to navigate Differ. Furthermore, the feedback collected from the DSMs on the training indicates that it has encouraged more formal language use which has influenced interactions with the students at times. Future DSM training will encourage them to be less formal and to have more fun with their role.

Understanding the educational and social experiences of mature students can enable HE institutions to shape their culture and structure to suit the needs and interests of these students (Mallman & Lee, 2017) particularly those transitioning into their first year of their courses (Mallman & Lee, 2016). In this study, 78% of the survey responses indicate that, before starting the university, they felt confident they would be supported during their study. This support is vital to mitigate many of the challenges faced by these students and to improve their retention in HE through providing assistance with social and academic integration (Cotton et al., 2016). For instance, academic staff can assist by integrating information about services and support into the curriculum which Heagney and Benson (2017) argue is an effective way of bringing mature students' attention to the support. Moreover, institutions should integrate MIM tools that can be utilised by both educators and students to their larger educational systems. This can reduce the unnecessary stress of learning different tools and promote the use of these tools among students.

Endnote

1. http://www.hear.ac.uk

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