EXPLORING UNDERGRADUATE STUDENTS USE OF A SKILLS DEVELOPMENT APP

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Abstract

It is well documented that the ownership of mobiles is high, particularly amongst the younger generation (Generations Y and Z) where smartphone ownership is nearing 100% [1]. The characteristics and behaviors of this younger generation of students and the environment they have grown up in [2] suggest they are used to – and expect – a level of technical and mobile communication/interaction and so it is an area which we, as educators, want to be able to offer as part of the student learning experience.

Studies have shown that higher education students have a preference for mobile learning over other forms of learning [3]. Whilst the pedagogical impact of mobile learning in more basic forms (e.g. downloadable lectures, or materials) have been explored to a reasonable extent in the external literature, there is far less existing on the use of mobile applications (apps) in higher education [4]. The literature which describes the use of mobile apps by students predominately focuses on information service apps or simply describes the development of an app, or students use of the app. There is limited research which goes beyond this and explores perceptions of both teaching staff and students when using an app, and investigating these perceptions are recognized as an important first step in this area [5].

The present research aims to investigate undergraduate students’ use of a skills development mobile web app, and student and faculty perceptions of using this app.

The mobile web app being used is called SENSEI (Social Endorsement Network for Skills Evaluation and Improvement). This is a skills development app which enables learners to record, share and endorse skills improvements with their peers. The app was made freely available to around 150 students at the start of two different courses running at Hult International Business Schools Undergraduate campus from January to May 2019. The courses selected were ‘Coaching’ and ‘Negotiation and Influencing’ as these courses require observable skills to be demonstrated as part of the classroom participation. In these skills-based courses, active learning is demonstrated through not only the retention of new knowledge, but through actionable behaviors. Classes include opportunities for students to practice their coaching and negotiation and influencing skills, for example via role plays or classroom debates.

Objective quantitative data was sought directly from the app about students use of the app. Online surveys were administered both before and after each course to collect qualitative and quantitative data. These surveys aimed to explore students’ attitudes and perceptions of usefulness, their expectations of the app in terms of hopes, fears and barriers and also any perceived benefits in education. Finally, faculty interviews were conducted to understand the instructor perspective regarding how they initially felt about the use of a mobile app in their classrooms, how easily they found integrating it into their existing teaching and assessment tools, and any benefits and shortcomings that the app brought in terms of teaching and engaging their students.

The methods in this research were designed enhance the knowledge base surrounding the use of mobile apps to facilitate/add to the higher education learning offering, this is of particular importance in the engagement of younger students learning in a modern context. This was the first time an app has been rolled out to these students; therefore, this paper focuses on the student’s uptake and use of the app. Data collected is used to explain the levels of uptake and use observed. The paper also explores faculty and students perceptions of the app and whether the app enriched the learning experience.

Keywords: mobile learning, mobile app, undergraduate students, skills development.
1 INTRODUCTION

It is well documented that the ownership of mobiles is high, particularly in the younger generation where smart phone ownership is nearing 100\% [1]. The characteristics and behaviors of this younger generation (Generation Y) students and the environment they have grown up in [2] mean have high levels of technical and mobile communication. They are used to – and expect – a level of technical and mobile communication/interaction and so it is an area which we should be able to offer as part of the student learning experience, in order to increase student satisfaction.

Mobile learning is a relevant innovation in teaching and learning in higher education [4]. Previous research conducted by Ashridge Executive Education for UNICON (University Consortium for Executive Education) into how the use of mobile technologies are changing the executive learning landscape found an increasing use of mobile learning in both education and the workplace [6].

Students in higher education have shown a preference for mobile learning over other forms of learning [3]. A popular form of mobile learning in higher education is the use of mobile applications (apps). These are small programs that users can access wirelessly or download on to a mobile device (e.g. smartphone) and enable remote access to resources, feature interactive activities such as games or quizzes that facilitate for eLearning and/or allow for user to user communication with the purposes of sharing educationally relevant information [4]. Examples of potential benefits to the student learning experience of using mobile learning apps may include: the potential for any-time any-place learning; social/community aided learning; 'micro learning'; gamified learning; peer feedback learning; and competency based learning.

An increasing number of mobile apps are available to students, and the literature shows that the use of mobile apps is high in higher education students [3]. Many mobile apps have been created specifically to help students organize their studies, social life and home life [7]. Apps are also being used to help students study a variety of different education disciplines. There is an opportunity now to go beyond just providing students with an information service app; instead focusing on specific course content, engaging with information and so on.

Whilst the pedagogical impact of mobile learning in more basic forms (e.g. downloadable lectures, or materials) have been explored to a reasonable extent in the external literature, there is less existing on the use of mobile apps in higher education [4]. The literature which describes the use of mobile apps by students predominately focuses on information service apps or simply describes the development of an app, or students use of the app. There is some research which goes beyond this and explores perceptions of both teaching staff and students when using an app. Investigating these perceptions are recognized as an important first step in this area: “perceptions towards mobile learning should be the first step to implementing mobile learning on college campuses” [5].

Furthermore, the research that has been conducted into the use of mobile learning apps has typically focused on ‘hard’ subjects such as medical training, learning hard sciences and language education. Findings from these studies are generally positive, reporting increasing convenience, flexibility of learning, facilitated blended learning, for example [8, 5]. Finally, any more neutral, or less positive pedagogical findings, as cited by [3], relate to a reliance on mobile learning exclusively, rather than using it as a form of blended learning. The existing research repeatedly emphasizes that mobile learning should be used in combination with existing learning; as a support to students a faculty by providing them with a service that facilitates learning, “using technology in a course does not enhance that course unless the technology is used to enrich the pedagogical approach” [9].

At Hult, students study a mix of both humanities/arts subjects as well as science/technology subjects. With an emphasis on skills as well as knowledge, some courses focus the majority of their assessment on the student’s demonstration of behavioral skills shown through practice and experiential tasks, rather than the acquisition of new knowledge shown through essay writing and course work. Therefore, this research aimed to trial a web based skills development app with Hult undergraduate students for the first time. The specific aims were to investigate: the student uptake and use of the app; student and faculty perceptions of the app; and whether the app enriched the learning experience.
2 METHODOLOGY

2.1 Procedure

A web based app was offered to a total of 157 students all of whom were studying at Hult International Business School in the United Kingdom. The courses selected were undergraduate courses for students on the Bachelor of Business Administration (BBA) program. The courses were taught at the London campus from January to May 2019. ‘Coaching’ and ‘Negotiation and Influencing’ courses were selected as they require observable skills to be demonstrated as part of the classroom participation. In these skills-based courses, active learning is demonstrated through not only the retention of new knowledge, but through actionable behaviors. Classes include opportunities for students to practice their coaching and negotiation and influencing skills, for example via role plays or classroom debates.

The researchers involved in this project visited students during a class to introduce them to the app and invited them to participate in the research project. Information was shared about the potential benefits of using the app and the basic features of the app. Further information was shared to the students via an internal online portal that the students have access to.

During the information session, students were asked to sign a consent form of where they allowed Business Simulation to share the research data with us. They were also asked to complete an informative online pre-survey regarding their technological readiness, hopes and concerns about using mobile technology for learning.

During the project, the researchers on this project were positioned as community managers within SENSEI and reminders were sent to students via email and via the app as prompts for them to engage. Faculty also provided verbal reminders in class.

At the end of the project students were sent a link to a second online survey via email. Both pre and post surveys were also made available to students via their online portal. Finally, the faculty who ran the course took part in an interview to understand the instructor perspective.

2.2 Materials

2.2.1 SENSEI app

The mobile web app being used is called SENSEI (Social Endorsement Network for Skills Evaluation and Improvement). This is a web based skills development app which enables learners to record, share and endorse skills improvements with their peers. Students set their baseline level of skills at the beginning of the course and are then required to reflect and record any improvement in skills throughout the course. SENSEI also facilitates peer encouragement in the form of endorsements. If students have observed improvements in their classmates’ skills they can go into the app and endorse said student’s improvement. Students’ skill levels will only increase if they have self-recorded an improvement, and this improvement has been endorsed by their peers or faculty. There were also gamified elements of the app including a leader board of engagement.

Student engagement with the app and student self-reported and endorsed performance was collected directly from SENSEI.

2.2.2 Student Surveys

Online surveys completed both before and after each course provided qualitative and quantitative data. These surveys explored students’ readiness for technology, attitudes and perceptions of usefulness, their expectations of the app in terms of hopes, fears and barriers and perceived benefits to education.

The student readiness for technology was used with a self-developed scale. This scale included 6 items measured using a 6-point Likert scale ranging from Strongly disagree to Strongly agree.

A modified version of the Unified theory of acceptance and use of technology model (UTAUT) [10] was used in the online survey. UTAUT has previously successfully explained a great variance in both behavioral intention and technology use [10]. The sub-scales from UTAUT that were included where Performance Expectancy, Hedonic Motivation, Behavioral Intention, Facilitating Conditions, Habit, and Effort Expectancy. The sub-scales Price Value from the original UTAUT was dropped because the app was offered free of charge to the students and the Social Influence sub-scales was replaced a theory of planned behavior model.
The theory of planned behavior model includes Student readiness, Faculty readiness, and Attitude based on a model that previously explained student's acceptance of mobile learning [5]. Table 1 shows example items and their Cronbach’s alphas from this study.

2.2.3 Faculty Interviews

Finally, two faculty interviews explored how they initially felt about the use of a mobile app in their classrooms, how easily they found integrating it into their existing teaching and assessment tools, and any benefits and shortcomings that the app brought in terms of teaching and engaging their students.

2.3 Sample

Twenty-nine percent (n = 46) of the invited students signed the consent forms and signed up to use the SENSEI app. Of these 46 students, 35 students completed their self-assessment, but 11 students never engaged with the app further. This leaves a sample of 24 students using the app alongside the course.

The students that completed the survey were aged between 19 and 26 years with a median age of 21 years old. There was an equal gender split of 50% females and 50% males.

3 RESULTS AND DISCUSSION

Overall student’s uptake was low, many students decided to not sign up or failed to participate beyond registration. In order to understand why this was the case, we need to consider interactivity among technology, students, and teachers [11]. Therefore, the discussion draws on data and commentary from students, faculty, app developers, and researchers in order to understand levels of students uptake and experience of SENSEI.

3.1 Student Readiness

The results from the different control variables indicated that the students reported high on technology readiness, the selected variables of the UTAUT model, and student readiness. This indicates that the students were capable to use mobile technology, had the relevant resources, and the interest in mobile technology which would help navigating the mobile app, see Table 1 for means, standard deviations, and percentages of the measured variables.

Table 1. Number of items, sample items, Cronbach’s alpha, means, standard deviation and percentage of the sample that overall agreed with the statements of the measured variables.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Example item</th>
<th>α</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>% agreed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological readiness</td>
<td>I generally understand how to use new technology without other's guidance</td>
<td>0.84</td>
<td>4.40</td>
<td>0.92</td>
<td>75%</td>
</tr>
<tr>
<td>Performance expectancy</td>
<td>Using mobile technology increases my chances of achieving things in learning that are important to me</td>
<td>0.96</td>
<td>4.02</td>
<td>1.20</td>
<td>64%</td>
</tr>
<tr>
<td>Hedonic motivation</td>
<td>Using mobile technology for learning is fun</td>
<td>0.79</td>
<td>4.36</td>
<td>0.94</td>
<td>68%</td>
</tr>
<tr>
<td>Behavioral intention</td>
<td>I will try to use mobile technology for learning in my daily life</td>
<td>0.96</td>
<td>4.21</td>
<td>1.28</td>
<td>72%</td>
</tr>
<tr>
<td>Facilitating conditions</td>
<td>I have the knowledge necessary to use mobile technology</td>
<td>0.82</td>
<td>4.92</td>
<td>0.85</td>
<td>96%</td>
</tr>
<tr>
<td>Habit</td>
<td>Using mobile technology has become a habit for me</td>
<td>0.86</td>
<td>4.14</td>
<td>1.29</td>
<td>68%</td>
</tr>
<tr>
<td>Effort expectancy</td>
<td>Learning how to use mobile technology is easy for me</td>
<td>0.94</td>
<td>4.78</td>
<td>1.02</td>
<td>80%</td>
</tr>
<tr>
<td>Student readiness</td>
<td>I think other students would be in favour of utilizing mobile learning in their coursework</td>
<td>0.77</td>
<td>4.85</td>
<td>0.76</td>
<td>92%</td>
</tr>
<tr>
<td>Faculty readiness</td>
<td>I think faculty would believe that mobile technology could be a useful educational tool in their coursework</td>
<td>0.81</td>
<td>3.87</td>
<td>0.97</td>
<td>52%</td>
</tr>
<tr>
<td>Attitude</td>
<td>I would like my coursework more if I used mobile learning</td>
<td>0.97</td>
<td>3.79</td>
<td>1.54</td>
<td>56%</td>
</tr>
</tbody>
</table>
More specifically, the initial view of technology for learning purposes were also positive. For instance, 89% of the students that completed the pre-survey indicated that they somewhat agreed, agreed or totally agreed that technology increased their learning. Moreover, 76% indicated that general mobile technology was useful for their learning and 71% indicated that mobile learning helped them accomplish their learning more quickly. The qualitative open survey questions also yielded signs of optimism regarding the use of mobile technology for learning generally, and a small number of participants stated they were hopeful about the app, one student stated, “I hope it will provide much better opportunities to keep learning”. However, for the remainder of the students who felt positive about the use of SENSEI, their hopes were followed by concerns, for example, “I hope it will help me in my apprenticeship, but I am concerned about its complexity”.

Interestingly, the reported attitudes towards using mobile technology specifically in their own course work were less positive. In fact, 44% reported that they would not like their coursework more if they used mobile learning as a part of their learning experience and 40% indicated that using mobile learning in their course work was a bad idea. As visible in Table 1, students reported lower mean score towards their attitude of using mobile learning in their course, compared to the motivation of using mobile technology in general and how they perceive that mobile technology can enhance their learning performance.

Qualitative data revealed details which go some way to explaining their lower optimism regarding mobile learning for their course studies. Students report concerns about the separation between their coursework and their spare time: “I think people might be opposed to the idea of being able to do ‘work’ anytime anywhere”.

The largest theme within qualitative comments indicates that they are most worried about the technology becoming a distraction from their learning. For example, “Whilst it may be a wise idea to implement mobile learning, there are dangers that students will get distracted. As dopamine flows through our brains every time we get a notification it may make the process of studying coherently more difficult” and “I think it is good that Hult tries new innovative things, but I find that too much technology kills the way studying should really be. We get distracted too easily.”

Previous literature has identified concerns about the distraction potential of mobile learning technology, faculty members may worry that smart phone apps are disruptive and hard to control [9]. This concern was mentioned by the faculty involved in the project. One mentioned initial concerns about SENSEI detracting from the learning rather than enhancing it. Our research shows that this concern is also shared by students too, despite their enthusiasm for novel and fun ways of learning, when considering the use of mobile learning in their immediate course context, they were apprehensive. These students did possess a baseline of technological skills that suggest that they can use an app for learning. However, there appears to be an issue of motivation to use it in their coursework. They want the classroom to be free from distraction and use mobile technology as and when they choose to.

### 3.2 App Experience and Design

Data also revealed that the app itself needed further development in order to satisfy faculty and students expectations. One student mentioned the practical functionality of the app being unsatisfactory, which was further compounded by the lack of uptake of students, “With only 4 people [in the cohort] on the platform and most of the buttons being unclickable, I wouldn’t say I took anything from it. Still, I repeat the fact that the idea is awesome, it just needs further developing”. A key aspect core to the design of the SENSEI app was that learners should take responsibility for their own development. This meant the app was designed so that learners have to declare that they think they have improved and receive confirmation (or not) from their co-learners and faculty. Following this, in order to be endorsed by peers or faculty, the student needed to have self-assessed their own skills first, this meant that students and faculty were not freely able to give encouragement or acknowledgement when the learner had improved unless the learner had recognized this themselves. Both students and faculty found this approach frustrating as there were times when they wanted to endorse a student based on improved performance but were unable to do so. The alternative approach would be to allow users receive unsolicited endorsements. However, the app design choice was based on best practice in experiential learning [12,13, 14].

Faculty also identified ways in which SENSEI’s functionality could be improved in order to really make a difference to student’s skill development. According to one faculty member the opportunity to provide qualitative feedback would have been useful, so that the student can identify a specific instance when they performed well and understand why or how that behavior evidenced a positive development of their
skills. During the trial the app only allowed a one click endorsement which does not provide substantive reasoning for the student to reflect on.

Future studies may explore further development of the app in some of its core concepts based on these findings.

3.3 Embedding New Technology into the Course

Bringing technology to students in a way that is relevant and useful to their learning requires sufficient embedding of the technology into the course activities, curriculum and delivery. Many studies have highlighted the need for considered integration of technology to ensure it becomes a cohesive part of the learning experience, developing delivery designs which blend mobile and non-mobile technologies is important for the integration of technology into teacher pedagogy [15]. For the purposes of this study, a tailored skills model was designed to be relevant to the learning objectives of each course, students were reminded to engage with the app by faculty during class particularly after a significant role play or class activity. Despite these efforts, student survey data revealed that there remained a disconnect present between class activities and requirements from the app, for example, “The skills the app provided for us to endorse our peers were explained briefly. But there is no real connection made between the classroom learning and then the relevancy of the app in connection to what was discussed in the classroom. The curriculum and the app need to be designed together, in order to go hand in hand. My suggestion would be to look at chapters and specific skills, or even provide chances for the users to state what they learned themselves.”

Research shows that it is not only the tailoring of technology to the course which is important, but the tailoring of the course to the technology. The courses continued as they had done prior to the introduction of SENSEI which made it difficult for students to see the real value of the app. It could be argued that there was not enough attention paid to make the course complementary for app to be embedded, this limited the impact of the app and its potential learning outcomes.

Something that was identified on reflection was the tension between voluntary participation which was required as part of the research project, and compulsory participation which may have benefitted uptake levels. The students in this sample were unlikely to participate in any activities which were not credit baring, despite there being potential value added to their learning. But since this was a research project, students had every right not to participate, therefore it was difficult for faculty to push participation and fully embed the app since this may have disadvantaged those who chose not to use SENSEI.

3.4 Behavior Change Takes Time

The courses that the app was built into were four weeks long, this was viewed as suitable as the intensity of the courses was high. However, post course interviews with faculty members suggest that this length of time was too short to get students on board and using the app and may go some way to explaining low student app use. Each class was 80 minutes long and course content took priority which meant the briefing of students on how to use the app was very limited, therefore comprehensive instructions were sent to students via email and the student portal. This meant that participation relied on students downloading and registering in their own time which may have contributed to low uptake levels.

It can be tempting to assume that undergraduates, as digital natives, will embrace and adapt to new technology at a very fast pace however, faculty involved in this study stated that student’s require time to adapt, time to change behavior and time to learn how the technology works

3.5 Community Management

Using an app like SENSEI requires the development of a virtual community through which the learning and managers must interact. The challenges in creating learning communities are well documented [16, 17] particularly in the area of adoption and sustainable engagement by participants. There are frequent descriptions of virtual communities being described as ‘virtual ghost towns’ [18] where people sign-in once and never return. There are also references to a 90:9:1 metric where 1 person participates actively, 9 people react to this activity and 90 people lurk and show no evidence of engagement.

It is clear that the role of Learning Community Management is vital as a learning community will not just develop naturally without considerable support and encouragement. Community Management must focus on: Engaging early adopters to use the community; Building up the levels of engagement from all
participants; Creating compelling reasons to visit the community regularly; Showcasing and recognizing active participants.

4 CONCLUSIONS

The use of mobile technology is constantly increasing, and students have indicated that they show a preference for mobile learning [3]. Educational apps in higher education has predominantly been developed to be used as information sharing where staff and students can access course content, but apps have potential to be used as part of the education in the student’s course work.

Students today show a high readiness for using mobile technology, despite this, behavior change takes time. The courses used for this research had a duration of approximately four weeks which was too short. The students did not have enough time to get used to the technology or see the benefits of using it in their course work. Further research in this field should allow more time for students to get comfortable with the content and more time to introduce the app for the students.

The students reported high hedonic motivation towards mobile technology for general learning and high-performance expectancy for general learning, but lower attitudes towards using mobile technology integrated in their coursework. With this in consideration, further research could study if the benefits of mobile learning technology is more beneficial on a bespoke individual level instead of a collective tool in the classroom.

An app like SENSEI has the potential to reflect the course content into the app. Therefore, the role of the faculty is hugely important from the beginning of the app development into the use in the classroom. This research highlights that it is not only important to tailor the technology to the course, but to think through how the course itself blends with the technology. Finally, using any app like SENSEI which requires participation and interaction requires considerable attention is paid to both initial adoption and on-going community management.

The findings from this research enhance the knowledge base surrounding the use of mobile apps to facilitate/add to the higher education learning offering, this is of particular importance in the engagement of younger students learning in a modern context.

ACKNOWLEDGEMENTS

We would like to thank our colleague Scott Thompson for his valuable contribution. We would also like to thank Hult faculty Amy Armstrong and Robert Hamwee for their support.

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