Can e-Learning Enable the Transition to University for Computing and Electronic Engineering Students from Low Socio-Economic Status? A Socio-Cultural Approach

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ABSTRACT

Students enrolling to university holding vocational qualifications to study Computer Science and Electronic Engineering struggle to adapt to the requirements of academic life. As a result, they show higher dropout rates and perform less well than the sector-adjusted average. Following a socio-cultural approach, we present a practice-based ethnographic study of an e-learning initiative at a Russell Group University in the UK aiming to enable the transition of students holding Business and Technology Education Council (BTEC) qualifications. We look beyond "access" issues around e-learning and instead focus on the university's organizational implementation efforts and the ways students engage with e-learning. Our findings show that although the online module could potentially enable students to actively engage in developing their personal and professional identity, the university struggled to embed it in their strategy and organizational practices.

Keywords: Transition, Vocational qualifications, e-Learning, BTEC, Socio-cultural, Professional identity

1. INTRODUCTION

Vocational qualifications, such as BTEC (e1), although they have been increasing the past years, they are considered as inferior to other qualifications such as A-levels and students holding them are less likely to attend pre-1992 universities or find high-paid jobs upon graduation. Considering the fact that students with such qualifications are most likely to come from a low socio-economic status, this raises concerns about the state of Higher Education in the UK and its ability to widen access to disadvantaged groups, especially in institutions with higher status and positional value, whose graduates enjoy higher labor-market returns (Croxford & Raffe, 2015).

Given their disadvantaged position, students with vocational qualifications struggle with their transition to university, especially when they are given the chance to enroll in a Russell Group (e2) institution. These struggles are expressed on the emotional level (loneliness, depression, disengagement) but affect the abilities of students to be motivated, confident, and feel that they belong.

Usually, studies on transition put the blame either on the students or the institution, thus highlighting certain deficits respectively. In this paper, we follow a more nuanced socio-cultural approach that understands transition in the context of a *socio-cultural incongruence* between students from low socio-economic status and the universities in which they move to study (Devlin, 2013; Devlin & McKay, 2014). Socio-cultural incongruence refers to the circumstances under which students from a certain socio-economic background understand, or rather do not understand, the "unspoken" and "implicit" requirements of academic life and perform in ways that meet or not meet them (Devlin, 2013). Indeed, many of those students do not know that these unspoken requirements exist, never mind that they must understand and then respond appropriately to them (Devlin, 2013; Devlin & McKay, 2014).

We focus on e-learning initiatives as a form to bridge this socio-cultural incongruence. E-learning has been shown to have democratizing potential that smoothens inequalities, however, it may also perpetuate them. To work around this ambiguity, we extend our scope beyond issues around access to e-learning resources and content, into the variable contexts in which e-

learning initiatives are formed, and the impact that local organizational and institutional contexts can have on their uses and outcomes. By utilizing practice-based ethnographic methodologies, we look into a case study of an e-learning initiative aiming to enable the transition of students with vocational qualifications into a Russell Group UK university to study Computer Science and Electronic Engineering. More specifically, we ask: How does the specific university designed and organizationally implemented an e-learning initiative to address the transition of students from a low socio-economic background into academic life? Moreover, in what ways did students engage with this initiative once it was launched?

2. LITERATURE REVIEW

2.1 Vocational Qualifications, Academic and Employment Success

Vocational qualifications for school-leavers in the UK, such as BTEC, have been increasing in the past few years (Hayward & Hoelscher, 2011). From 2011 to 2015, for instance, there has been a 50% increase of students with BTEC qualifications in UCAS applications (UCAS, 2016). Vocational qualifications, however, have been considered as inferior to other qualifications such as A-levels (Gill, 2018; Gill & Vidal Rodeiro, 2014; Shields & Masardo, 2015; Smith & White, 2015). Moreover, students with vocational qualifications are less likely to attend pre-1992 universities than students with conventional academic qualifications (Hoelscher et al., 2008) and instead are more likely to attend low-tariff universities (Mian et al., 2016).

Students holding vocational qualifications are more likely to come from low participation neighborhoods (Shields & Masardo, 2015), from ethnic minorities (Bhattacharyya et al., 2003) and more likely to be first generation higher education (HE) students (Rouncefield-Swales, 2014). In other words, vocational qualifications are linked with students belonging to disadvantaged groups and low socio-economic status.

At university, students with vocational qualifications show higher dropout rates (Hayward & Hoelscher, 2011; Roucefield-Swales, 2014; Round et al., 2012) and perform less well than the sector-adjusted average (HEFCE, 2013). Moreover, in addition to the differential outcomes in progression and academic results, a similar picture appears in relation to employment prospects after graduating from university. Specifically, 39% of students with vocational qualifications were in employment six months after graduation, compared to 66% of students with a UCAS tariff of more than 450 points (HEFCE, 2013). A report of the same year by London Economics (2013), however, shows that "both men and women in possession of BTECs plus degrees are more likely to be employed, and amongst those that are employed, more likely to be employed on a full-time basis" (p. 17). Nevertheless, these graduates were graduating from lower tariff universities and had studied subjects that would earn them lower wages (SMF, 2016). Degrees such as law, medicine, dentistry, STEM (e3) etc. that lead to higher employment and salary prospects are less likely to be accessible to vocational qualification holders. Therefore, both the subject of degree and institution attended make a considerable difference to graduates' earnings (Belfield et al., 2018).

Overall, students with vocational qualifications such as BTEC are most likely coming from a low socio-economic status

and are disadvantaged in relation to which university they go to, what course they are more likely to study, how well they do in their course and what kind of employment they are more likely to get after graduation, if any. In this paper, we are focusing on the transition of such students to university as an important phase that can have an effect on the above disadvantages, either by intensifying them or by properly addressing them. In the following section we discuss transition to university.

2.2 Conceptualizing Transition to University

Students with vocational qualifications, given their disadvantaged position, are usually struggling with their transition to higher education (Briggs et al., 2012; Devlin & McKay, 2014; Leese, 2010). Indeed, all students are experiencing multiple transitions upon entering higher education: changes in their living situations, negotiating academic environments, developing new friendships, and adapting to greater independence and responsibility in their academic lives (Pittman & Richmond, 2008). Disadvantaged students may experience loneliness, distress, academic disengagement and even depression (Adlaf et al., 2001; Gall et al., 2000; Wintre & Bowers, 2007; Wintre & Yaffe, 2000). Therefore, transition is to a large degree emotional and affects aspects such as confidence, motivation, perseverance, and creativity which make a big difference to the individual's wider disposition to learning, or of the potential changes in learning identities as students move from one setting or life stage to another (Christie et al., 2008).

Theoretically, transition to university has been understood through what has been called "deficit approaches" (Devlin & McKay, 2014). These include two opposing views that either see the student as the problem (McKavanagh & Purnell, 2007; Morales, 2000; Vuong et al., 2010) or the institutions in which they enroll to study (Bamber & Tett, 2001; Billingham, 2009; Zepke & Leach, 2005). Studies that see the students as the problem usually refer to issues around resilience (Morales, 2000), self-efficacy (Vuong et al., 2010), and motivation (McKavanagh & Purnell, 2007), whereas studies that see the institutions as the problem discuss what the institutions can do to fit students into their existing culture (Zepke & Leach, 2005) and that it is unfair to expect students to take full responsibility of adapting to the academic culture and suggest that institutions should make changes (Bamber & Tett, 2001).

More recently there have been more nuanced approaches however that are seeking to move away from those "deficit approaches" to understanding transition. More specifically, there is the socio-cultural approach that situates transition in the context of a *socio-cultural incongruence* and is seeking ways to bridge it through joint ventures between students and institutions (Devlin, 2013; Devlin & McKay, 2014). Such an approach is focused on understanding the differences in cultural and social capital between students from low socio-economic status and the universities in which they move to study (Devlin & McKay, 2014). Socio-cultural incongruence refers to the circumstances under which students from a certain socio-economic background understand, or rather do not understand, the "unspoken" and "implicit" requirements of academic life and perform in ways that meet or not meet them (Devlin, 2013). Indeed, many of those students do not know that these unspoken requirements exist, never mind that they must understand and

then respond appropriately to them (Devlin, 2013; Devlin & McKay, 2014).

Approaches that follow a social and cultural capital perspective in understanding the transition of students from low socio-economic status to university commonly use the "bridge" metaphor as a way to articulate potential solutions to filling the cultural gap (Briggs et al., 2012; Devlin & McKay, 2014; Leese, 2010). Universities, then, need to invest in building bridges, that is, to reform teaching and student support and create a "joint venture" with student populations (Bamer & Tett, 2001; Billingham, 2009; Devlin, 2013; Murphy, 2009) that would assist students to become enculturated into the ways of the university (Lawrence, 2005). In these joint ventures, students should not passively receive dominant cultural discourses but instead engage actively with them and potentially challenge them (Read et al., 2003). For example, instead of becoming "independent learners," they could instead become "interdependent learners" (Grant, 1997) as a new type of learner identity (Briggs et al., 2012).

In socio-cultural approaches, seeking to bridge the incongruence between students and institutions, student agency is seen as important (Devlin, 2013; Devlin & McKay 2014). Its importance lies on the fact that acknowledging students as agents allows us not to see them simply as passive consumers of dominant cultural discourses, but as entities that are involved in actively shaping them. In this context, student agency may be understood also as a reflective mechanism that allows them to start forming a personal and professional identity and a career path (Kapoor & Gardner-McCune, 2018; Luckett & Luckett, 2009). Professional identity includes social, personal, and cultural aspects and it might change over time based on a person's active or passive exploration and commitment to their chosen profession (Kapoor & Gardner-McCune, 2018; Marcia, 1966). Learners, however, have varied needs according to their differential negotiations of the natural, practical, and social orders, with some students being well on their way to becoming social actors and developing a professional identity while others are still in the process of forging a personal identity (Lucket & Luckett, 2009). Nevertheless, from pre-enrolment, to transition to university and throughout the developmental years of study, students go through a journey of developing this professional identity. For Computing and Electronic Engineering students in particular, this could be understood as "the transformation of one's interest in computing into seeing one's self as a person who does computing and self-identifies with one or more computing sub-disciplines and career paths" (Kapoor & Gardner-McCune, 2018, p. 192). Bridging socio-cultural incongruence and identifying the unspoken cultural norms of academic life, therefore, include students being able to navigate industry professional networks and starting to learn to become tech professionals. For Computing and Electronic Engineering students this takes a very specific form, as we shall see below in more detail, and it constitutes a specific manifestation of a gap between vocationally-oriented identities and academic standards.

2.3 The e-Learning "Bridge"
Digital technology, especially in the form of designing and implementing e-learning projects in universities, may be seen as an effort to create bridges that would address the socio-cultural incongruence between incoming disadvantaged student groups and the culture of the universities they enroll in. This

way, on the basis of e-learning projects, students and university teaching and support staff could form a joint venture and a learning community that would facilitate a smooth transition and also set the basis for the formulation of a professional identity and a career path for them.

E-learning has been seen as a democratizing force that smoothens inequalities by making knowledge accessible to people previously not being able to reach it (Pegrum, 2009; Raza & Murad, 2008). Although the potential of e-learning technology to democratize education is undeniable, some authors argue that e-learning may also enhance and reproduce social inequalities that have been historically present in educational institutions and in broader society (Carr-Chellman, 2005; Crawford & McKenzie, 2011; Hargittai, 2002). Therefore, even if access is feasible, factors such as motivation of the users and their particular needs play an important role in whether individual learners benefit from e-learning (Anderson, 2005).

This ambiguity in the role of e-learning technology and its effects on social inequalities calls for a shift in our attention from an argument about "access" to e-learning to an argument about the "variable contexts" in which these technologies are formed, and the impact that local contexts can have on their uses and outcomes (Anderson, 2005; Clegg et al., 2003; Crawford & McKenzie, 2011; Kennedy et al., 2008). More specifically, it has been shown that when it comes to e-learning there is not one single, clear path that ensures successful results, therefore, "the operational context is thus crucial to the choice of tactics that are likely to lead to success" (Oliver & Dempster, 2003, p. 144). Considering the organizational and institutional context then, is essential in planning institution-wide e-learning initiatives (McPherson & Nunes, 2006; Sharpe et al., 2006). A particular concern with institution-wide e-learning is the extent in which the institution is able to balance the levels of control that are exercised by their deliberate strategy and planning with the local contingencies that surface during local implementations (Jones & O'Shea, 2004; Mintzberg, 1989). Moreover, the ways in which e-learning initiatives are integrated with and embedded into existing organizational structures and pedagogic practices and systems are of outmost importance (King & Boyatt, 2014). This includes not simply technical integration but also ways in which e-learning is embedded within an organization's culture and structure, how it is designed within particular institutional settings and how it is delivered to the learners (McPherson & Nunes, 2006). Finally, in an era where resources are limited and austerity programmes widespread, it is imperative that e-learning initiatives are sustained organizationally into the future (Stepanyan et al., 2013).

With this research, we hope to highlight some of the particular circumstances within the organizational environment of the university influence choices having to do with the design and implementation of e-learning environments and also the ways in which the targeted students engage with them.

3. METHODOLOGY

3.1 Research Context and Unit of Analysis
The controversial role of e-learning technology, its variable outcomes as a means to smoothen inequalities and its dependence on local implementations of e-learning initiatives has influenced our research focus. More specifically, following

a qualitative case study approach (Merriam, 1988), our unit of analysis is focused on an e-learning initiative developed as an intervention to address the transition of students from disadvantaged backgrounds into Electronic Engineering and Computer Science programmes offered by a Russell Group University in the UK.

The department offers nine undergraduate programmes. These include mainstream Computer Science and Electronic Engineering degrees and associated variations such as Computer Science with Math, Computer Science with Art, Computer Science with Management, and so on. All these programmes typically have an AAB-ABB at A-levels entry requirements, however, they also accept students with vocational qualifications, namely BTEC, in a variety of mixes depending on the programme. In most cases, in addition to the BTEC the university asks for a grade b or 5 in GCSE Math or A-levels.

The e-learning project was planning to design and implement an online module that would become available to incoming students prior to enrolment to help them with transitioning to university. The units in the online module include: welcome and transitional information, student journey, a diagnostic quiz, interactive campus map, meet our staff, preparing for exams and revisions, sources and referencing, cite them right, reading, writing, and employability skills.

3.2 Data Collection and Analysis
Data were collected through a variety of methods, including direct observations of the ethnographic type (Pabian, 2014). More specifically, our approach could be described as a "practice-based ethnography" which has been defined as:

> *"...fine-grained, usually immersive, multi-method research into particular social activities aimed at developing 'thick description' (Geertz, 1983) of the structured behavioral dispositions, social relations, sets of discourses, ways of thinking, procedures, emotional responses and motivations in play. Beyond that descriptive agenda the approach seeks to uncover broader reservoirs of ways of thinking and practicing which are being differently instantiated locally"* (Trowler, 2014, p. 19).

Practice-based methodological approaches focus on situated practices, that is, practices within certain local contexts and not on individual actors or structures (Trowler, 2014). For this reason, it is suitable to explore e-learning initiatives that aim to address issues around transition to university, which do not rely on deficit understandings that put the blame on either the students (individual actors) or the universities (impersonal social structures).

Moreover, such approaches allow a role for technological and material artefacts in practice performance. As Trowler (2014) explains: *"The accomplishment of social practice always involves artefacts of one form or another, the engagement of materiality, and there is a mutual entanglement of artefact use and practice accomplishment. As artefacts change, so do practices, but practices are also inscribed on artefact use" (p. 21)*. This makes it particularly useful when researching e-learning initiatives in the form of online modules, their technical features, content and also the ways in which the users (i.e., students) are enacting it for certain purposes.

The umbrella of practice-based ethnography allows the combination of a variety of data collection techniques. In this

research we conducted in-depth qualitative interviews with teaching and support staff (N = 14) and with members of the team that was designing and implementing the online module (N = 8). Moreover, we conducted focus groups (2 with 4 students each) that accessed the module and informal discussions and observations with students who accessed the module (about 30). We complemented these with user analytics data from the e-learning platforms (number of students, units accessed, frequency, etc.). Although these are not presented here, they were used to inform our broader ethnographic understanding. Because the online module was launched as part of a first year soft-skills module, we had the opportunity to discuss not just with our targeted group of students but with the first-year cohort as a whole. Subsequently, we carried out focus groups targeting students from low socio-economic status, that is, those with BTEC qualifications. Finally, we carried out direct participant observations of project meetings (10 in total), discussions and email conversations among the stakeholders involved in the design and implementation of the online module.

For the analysis of the data collected, we went through layers of qualitative coding identifying emerging themes. For the identification of relevant themes, we were guided by our conceptual framework on socio-cultural incongruence and e-learning as a "bridge" and by our practice-based methodological approach. More specifically, as shown in Figure 1, our framework of analysis consisted of the following two practices: (a) practice of designing and implementing an online module. This represented the efforts of the department in the specific university to utilize the potential of e-learning to bridge the socio-cultural incongruence between students with vocational qualifications and the university; and (b) practice of engaging with the module from students. This refers to how students, as active agents involved in their transition to university, used the content of the module to develop useful skills and start building their academic and professional identity. In the context of these two practices, we were not looking only for descriptive accounts but also for reflections and ways of thinking associated with these practices.
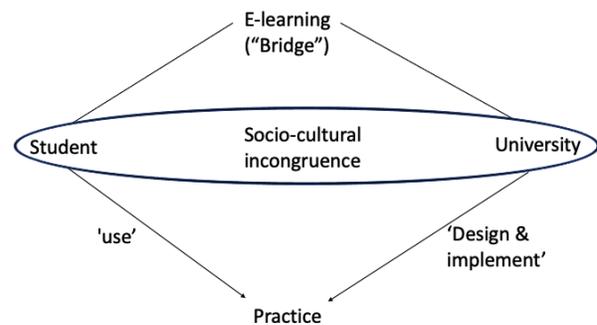

Figure 1. Analytical Framework

In the first layer of analysis, qualitative data were classified according to whether they refer to "design & implement" efforts on behalf of the university or to the "use" efforts by the students to engage with it. During a second layer of analysis, subsequent themes emerged and provided additional and more specific coding categories. For example, in the "design and implement" category there were themes related to the organizational situatedness of the online module, or the timing of the launch,

and so on. Such themes informed the structure of the empirical section of the paper as shown in the following section. Findings are presented as a "thick description" with occasional illustrative quotes to highlight certain aspects further.

4. EMPIRICAL FINDINGS

To provide some context of our study of the e-learning initiative, it is necessary to first describe the nature of the socio-cultural incongruence between BTEC students and the department and how it is being expressed in this study.

4.1 Understanding Socio-Cultural Incongruence: Vocational vs. Academic Discourses

We observed a paradoxical relationship between a strong focus on vocational discourse emphasizing employability and professional skills, on the one hand, and an academic focus surrounding teaching, learning and assessment practices, on the other. Although academic and study skills discourse is generally aligned with vocational aspects of Computer Science and Electronic Engineering (e.g., learning how to code), there are times where these two appear completely disconnected or even in conflict with each other. This is reflected in the students' expectations from their university experience in contrast with assumptions by faculty members that perpetuate stereotypes about the status of BTEC students in the department.

Student expectations are cultivated through dominant departmental discourses on employability and career prospects in the tech sector. These are expressed during open days, recruitment efforts, taster days, induction, and throughout the developmental years of study up to graduation. An employability and careers vocational focus is therefore a central discourse on which incoming students are called to build their individual and professional identity on. This is what connects culturally the incoming students with the department: a shared goal of successful employment in the digital economy upon (and sometimes prior to) graduation.

On the other hand, in order to justify the relevance of certain teaching, learning and assessment activities and align them with the ultimate common goal of graduate employment, the department switches the discourse from vocational aspects to articulating assumptions about the deficit in certain student groups in relation to their academic and study skills. This is most prevalent in parts of the curriculum that the Computing and Electronic Engineering students are not finding particularly relevant to their study programmes, such as academic writing, research methods, and communication. For example, "BTEC students are lacking critical thinking abilities" and "BTEC students don't read and write" are very common statements in departmental meetings.

The socio-cultural incongruence between students with vocational qualifications and the department in which they enroll, therefore, takes the form of a disconnect between the vocational aspirations and qualities of incoming students and the academic standards surrounding teaching, learning and assessment in Computer Science and Electronic Engineering. This disconnect is hard to bridge because on the one hand, students struggle to understand the relevance of academic and study skills (something that would help them do better academically) for their vocational orientation, while faculty are trying to legitimize their existence by devising links between

academic study skills and professional success. It is this context where the online module comes in.

In summary, students with vocational qualifications entering university, besides the level of competence with certain subjects such as math, they are struggling with adapting their vocational orientation into the academic standards (spoken and unspoken) governing teaching, learning and assessment activities. Universities, although they adopt a vocational discourse to attract and recruit students from low socio-economic backgrounds, later they are called to legitimize and defend academic teaching practices by constructing links between academic study and professional/employability success.

4.2 The e-Learning Initiative

As part of a larger collaborative project involving four universities and four further education colleges in the UK, the university in question designed and developed an e-learning intervention in the form of an online module. The aim of the module was to target students with BTEC qualifications, address their lack of social and cultural capital and facilitate their smooth transition to university. Moreover, the module aimed at helping those students to start engaging in the formulation of a personal and professional identity. For those purposes, the online module content could be categorized as follows:

a) Knowing the university (welcome, student journey, interactive campus maps, meeting our staff, etc.)
b) Study skills (preparing for exams and revisions, finding sources, referencing and citations, reading and writing skills, etc.)
c) Professional identity (employability skills, reflection, personal planning, etc.)

The aim was to make this module available to incoming students prior to enrolment so that they can start engaging at least with a).

Below we present empirical data as emerged in relation to the practices of designing and implementing the e-learning project and the way it was used by the students. After that we shall discuss issues relevant to those stages that emerged during the coding of our qualitative data.

4.2.1 Designing and Implementing the e-Learning Project.

This is an important phase of the project as it required those involved to mobilize and engage internal stakeholders to secure resources for the design, development, and implementation of the online module. The main issue that emerged in this stage which was decisive for the future of the project was that there were disagreements about where the module would be situated organizationally and who would be responsible for it after the end of the project. An academic involved in the planning stage explains: *"One of the main issues that had to be dealt with was to do with the ownership and management of the online module. Central University management believed that the page should be hosted at department level. However, there were questions as to who would take the responsibility of the page when the project terminates. After several rounds of discussion, it was decided to host it at department level."*

This initial disagreement caused delays to the project and affected the subsequent design of the module and its availability to the students prior to enrolment. More specifically, concerns were raised by the e-learning team who was uncertain if it was

technically possible to allow university login to someone who is not yet enrolled as a student, raising issues around security.

For the development of the content that would become available in the online module, the university used mostly existing material already available online. This approach was perceived as a "quick fix" because of the unwillingness of central management to devote resources for content development. This unwillingness was due to them considering the timeframe as being too short. An academic involved in the design of the online module explains: *"Reservations regarding the online module were related to the content that would be developed and the responsibility around development. The university's central management refused to develop content at such a short timeframe as the content development exercise would require a long period of time, i.e., according to them a year long project of its own to develop the learning content."* Due to these reservations, it was later decided to repackage content that already existed on the university website but focus on making it available through interactive and engaging interfaces.

Upon development, the university did a pilot to test the module, after which there were minor modifications on the interface. Lack of confidence on existing content, however, forced the online module team to form a partnership with an external content provider who provided additional content on study skills and diagnostic tests for the students to self-reflect and actively plan their learning.

Although the team was planning to launch the module prior to enrolment this did not happen. Alongside the issues mentioned above, there were also concerns raised by the Student Engagement Team in relation to the consistency of the pre-enrolment process. More specifically, this was related to who would contact the targeted students, what would they say to them, and how would that be different from the rest of the students. Overwhelming incoming students with information was also an additional concern. Given these barriers that caused delays, the online module team had to explore alternative avenues to launching the module post-enrolment. Eventually, it was decided that the online module would be launched as part of a first-year soft skills module taken by all students across programmes in Computing and Electronic Engineering. This made sense at the time as the soft skills module had access to all incoming students and also its content was suitable as it was aiming to develop study and professional skills.

The organizer of this module initially expressed concerns about disrupting the learning process by introducing the online module to the students as it was not initially in their plans. The module organizer finally agreed to launch by introducing to students some content as part of an employability exercise during week 8 of the semester (e4). More specifically, students were instructed to start with a 15-minute diagnostic test aimed at helping students self-assess their strengths and spot any weaknesses in their academic study skills that may affect their grades. Depending on how each student scored in the diagnostic test, the system would produce recommendations about which units of the module they should do next. These would rank from "highly recommended," "useful," and "worth a look." The students were instructed to continue with the recommended activities and complete at least two. Each of these units contained a journal entry option in order for students to capture thoughts and reflections as they go along. Following the completion of each unit there was a "practice activity" aimed at

putting some of the new skills to the test, while recording anything they thought was useful on the reflective journal. Students were also asked to complete a "student hack" sub section which tested their general understanding of the university and their programme. On completion of the employability unit (mandatory because that was the topic of week 8) and any one of the remaining units (reading, writing, preparing for exams), students would receive an Amazon voucher as a gift. This aimed to ensure high participation and engagement, given the engagement problems that the team experienced during the pilot.

4.2.2 Student Use: Selective Adaptation to Temporal Needs. The timeframe in which the online module is launched is important. Launching the module as part of a lab activity of another first year module certainly set the pace and nature of engagement with the students. With students having gone through 7 weeks of teaching and learning into their first semester, they already had some idea about what lectures and study skills were necessary for them. This prompted them to selectively focus their attention on specific activities in the module. In other words, the students adapted the online module to their immediate practical study needs, such as exam revisions, reading and writing, and time management. The students although they engaged with employability-related activities as part of the lab session, they did not focus so much on them at this stage as they did not seem as a priority. The student below, for instance, explains how the module at the time that it was launched helped them with exam revisions: *"What I mainly engaged in was preparing for exams and revision because obviously at that time [when the online module was launched] we were trying to prepare for a different mock exam that we had. And watching the video about revision really helped me because revision is something I really struggle with. It's not so much that you have to read from a book so I have to be more creative. So the video said that I had to be more interactive with my revision which I really think it helped me and pushed up my grades quite a bit."*

The online module also helped students with time management: *"It [the module] helped me split up my work a little bit more and take a few breaks. I just want to do all the work at once and go go go and get it finished and then get it submitted as early as I can. I was 50-50 as whether it [online module] was going to help me but now I can say with certainty that it did. It helped me get a more objective view of my work. The module suggested to take 15-minute breaks and I did that and it gave me the opportunity to gather my thoughts and get back to the work afterwards."*

We also found that once students felt that they were reaching a certain level of confidence on their abilities to manage certain teaching and learning tasks, they reduced engagement with the module. A student explains: *"I used the module quite a bit at the beginning but I found that I adapted the skills enough so I didn't feel that I had to go back to it every single time, because I kind of brought the skills into my study."*

In terms of personal/professional identity, the students showed signs of relating the content of the online module with their personal history and circumstances. Depending on the personal journey of each student, content was enacted and utilized accordingly, while students were perfectly capable of reflecting on why certain parts of the module content were useful to them at this stage instead of others. A student who

started with GCSEs but later moved to do BTEC, for example, explains the relevance of the online module to his personal history: *"I went from GCSE onto a BTEC course and the latter was quite vocational. I always enjoyed the vocational side of programming, but it did also mean that I had to move away from the documentation side and focus more on the programming side, whereas before it was the other way around. I didn't massively struggle with the work when I came here [at university] but the online module helped me a lot with the reading and writing skills, time management, revising and learning kind of thing."*

This student, then, is able to create a spectrum ranging from "vocational" to "academic" work to explain the personal journey they experienced with the switch from GCSEs to BTEC. Subsequently, they place themselves within that spectrum and on that basis, they enact module content according to their needs as university students and aspiring professionals.

In summary, the university introduced an e-learning initiative to improve the transition of students with vocational qualifications in university. Such students were previously identified as disadvantaged and lacking the social and cultural capital to do well at university and to start building a personal and professional identity that is necessary to successfully enter graduate employment upon completing the university studies. The online module team struggled to embed the module within its existing organizational structures and as a result they failed to launch prior to enrolment. Eventually they managed to launch during week 8 of semester 1 as part of an existing professional and study skills module. The time of launch seems to be quite important as students seemed to engage with the module by enacting aspects of its content that was relevant to their immediate, temporal, practical and study needs at that time. Nevertheless, although they missed transition aspects, they managed to establish relevance between the module and their understanding of a personal and professional identity in the field of Computer Science and Electronic Engineering as a way of linking entry qualifications with academic study and future graduate employment.

5. DISCUSSION

In this paper we set out to explore whether e-learning could provide a platform that can act as a "bridge" to address the socio-cultural incongruence between students with vocational entry qualifications transitioning to university and the institution in which they enroll. Our analysis intentionally extends beyond issues around access to e-learning (Crawford & McKenzie, 2011; Raza & Murad, 2008) by looking at local and contextual circumstances around an e-learning initiative in a specific university.

Following the bridge metaphor, as explained in section 2.3, to refer to the e-learning initiative presented in this paper, we organize our discussion of the findings along the following lines: (a) *building the bridge*, to refer to the development and implementation of the online module by the university; (b) *walking the bridge*, to refer to the use of the online module by the students; and (c) *sustaining the bridge*, to refer to issues around the future sustainability of the online module.

5.1 Building the Bridge
Building the bridge refers to envisioning and organizing the implementation of the e-learning project in the specific HEI. The challenges that the online module team faced in embedding the module within the university's existing infrastructures reveal a "breakdown" in the continuum between the deliberate strategy of the university to improve student experience and the emergent strategy, which aims to foster learning from the challenges of the online module implementation and thus reinforce the deliberate strategy (Jones & O'Shea, 2004; Mintzberg, 1989).

Indeed, while university's deliberate strategy, drafted centrally as a top-down rational planning for improving student experience, in principle would aim at controlling the e-learning project (Jones & O'Shea, 2004), we showed that they pushed responsibility to the department of Computing in terms of ownership and content development. Moreover, the role of emergent strategy, that is, bottom-up unplanned adaptations, should be to foster learning from the local implementation (Jones & O'Shea, 2004). However, in this case it served more as a *rescue function* for the official, deliberate strategy. This was evidenced at different stages of the project, in relation to content development, where the team was forced to re-package existing content and also in relation to launching the online module post- instead of pre-enrolment.

In terms of building a bridge to address socio-cultural incongruence during the transition of students with vocational qualifications to a Russell Group University, we may observe the following: Although there was a deliberate and conscious effort to create a space that would engage incoming students, help them develop awareness about the range of discourses and requirements of academic life (explicit and implicit) and provide strategies of how to meet these (Devlin & McKay, 2014), the disconnect between official, deliberate strategy at the university level and the reality of local implementation created challenges that weakened the foundations of the bridge. In other words, the intentions and the vision were well-informed by critical insights around socio-cultural transitions, however, the management and organization of the implementation of the e-learning project was falling short in fully realizing that vision.

5.2. Walking the Bridge
The timeframe of the module implementation determined the way in which students engaged with it, or the way in which they "walked the bridge" that the module team had built. Two aspects are of interest here: first, the ways in which students engage with and enact the content of the module, and secondly, the ways in which the module constitutes part of their student journey and a process of construction of a personal and professional identity as future tech professionals.

Firstly, students enacted module content according to their temporal needs at the time of launch. After the failure of the module team to launch pre-enrolment students were not so much drawn to transition-related content but rather to study-skills development, such as preparing for exams and time-management. Once the students built confidence in those skills, their engagement with the module dropped. In this particular e-learning initiative, therefore, launching post-enrolment was a missed opportunity to address the transitional challenges that students face, especially on the emotional level (Christie et al., 2008). Therefore, the "transition bridge" in the form of e-

learning should be in phases and temporally arranged to be effective.

Nevertheless, the students that interacted with the online module were in a position to situate it in their personal biographical narratives, cultural influences, and student journeys (Hodkinson & Bloomer 2000; Holmegaard et al., 2014; Osborn et al., 2003). We see in our findings that incoming students were able through the online module to relate their personal history and background vocational qualifications with a professional identity by identifying specific professional roles (e.g., having to do with coding or documentation) and linked these with specific study skills they need to do well at university. This suggests that e-learning has in fact potential to integrate vocational and professional aspects with academic study requirements and involve both in their personal and professional development.

5.3. Sustaining the Bridge

E-learning initiatives in general are vulnerable to sustainability and longevity (Stepanyan et al., 2013). Besides issues of funding and austerity-related cuts (Stepanyan et al., 2013), organizational issues around e-learning implementation can be threatening to the initiative's continuity. Issues around timely launch, ownership and responsibility of the online module resulted to difficulties in embedding it in the institution's organizational and learning infrastructures. As a result, the future of the online transitions module was uncertain. It is important, therefore, for e-learning initiatives to be able to anchor themselves in solid organizational infrastructures and processes that would ensure their long-term sustainability and impact, otherwise they evaporate.

6. CONCLUSIONS

Computing and Electronic Engineering students holding vocational qualifications when entering university are usually underperforming due to lacking the social and cultural capital necessary to master the study skills and actively start authoring a personal and professional identity as a future tech professional. As a result, they struggle with study skills and with activities designed to enhance their employability potential. Transition to university has been identified as an important phase to address such issues and make sure these students are not disadvantaged in comparison to their classmates from more privileged backgrounds.

Following a socio-cultural incongruence approach that supports the establishment of "bridges" connecting incoming students and universities and smoothens the transition to university. E-learning may be such a "bridge" by allowing students to develop awareness of the range of discourses and requirements of academic life and provide resources on how to meet these. The mere availability of e-learning, however, does not mean that the students and universities will be able to form "joint ventures" and bridge socio-cultural incongruence. Local organizational implementations of e-learning are quite important and may produce variable outcomes. Specifically, we showed here that difficulties in embedding the online module within existing organizational processes and infrastructures affected the module's impact on the targeted group of students and also threatened the sustainability of the initiative going forward.

However, even though the module failed to address transition needs, students enacted its content according to their temporal needs and were in a position to engage with it as part of the process of developing a personal and professional identity as future tech professionals.

Finally, we contribute the view that studies on e-learning and inequality that discuss access to resources and systems should include discussions of local organizational implementations. More specifically, access to e-learning is not limited to having reliable wifi, computing equipment or even specific teaching and learning content; it also includes questions about how it is properly embedded within organizational structures and learning processes. Although a university may be aware of the transition problems faced by students from low socioeconomic status and be well-intentioned in trying to address them, they may still fall short, as we showed in this study, due to such organizational issues.

7. ACKNOWLEDGEMENTS

8. ENDNOTES

(e1) Business and Technology Education Council (BTEC) is qualification for entry into higher education intended to serve as a vocational qualification that equip students with knowledge, skills and behaviors in specialist area. See https://qualifications.pearson.com/en/qualifications/btec-nationals.html for more information.

(e2) The Russell Group is an exclusive group of research intensive universities. The standard of entry is set high to attract high calibre students.

(e3) Science Technology Engineering and Mathematics (STEM) are subject areas with lower uptake due to the social economic background of the students (Cooper & Berry, 2020). STEM related careers are found to have a higher impact to the state of affairs in the future with a rapid rise of demand for skills required for present and future jobs (SMF, 2016).

(e4) The solution to launch the online module as an employability activity of a first-year module made it impossible to target only students with vocational qualifications. Therefore, it was made available to all students irrespective of entry qualifications with the hope that BTEC students would also take advantage of this opportunity.

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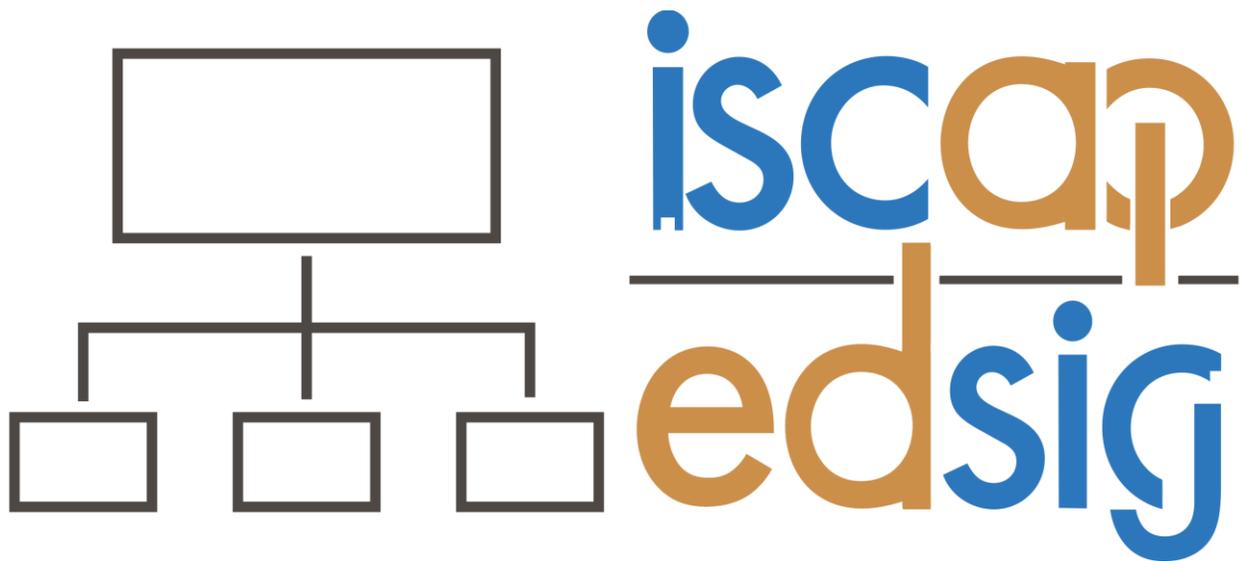
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