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ENHANCING THE TRANSITIONAL EXPERIENCE OF TAUGHT POSTGRADUATE STUDENTS: A CASE STUDY FROM AN ONLINE DISTANCE LEARNING PROGRAMME IN GEOGRAPHICAL INFORMATION SYSTEMS

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Abstract

Digital and distance-learning courses are on the rise in higher education but are students ready for the challenges that lie ahead? This paper will report on research undertaken to identify perceived gaps that exist between the actual, and desired, digital literacy skills and quantitative data handling capabilities of students starting on a taught postgraduate programme in a Science, Technology, Engineering and Mathematics (STEM) subject - Geographical Information Systems (GIS). The research is exploring some of the challenges of distance learning, focusing particularly on the transitional stage of 'stepping up' to a distance learning Master of Science (MSc) course. Drawing on the author's experience of delivering and managing a successful and internationally-recognized distance learning programme for over 10 years, and on new data collected from an ongoing teaching enhancement project led by the author, the objective of this research is to design, and ultimately develop, a series of discrete online resources that could be made available to the students before they step onto the standard induction and orientation activities of a STEM programme.

What was once viewed as an unconventional route to study in higher education is fast moving towards the conventional. Whether we like it, or not, Massive Open Online Courses (MOOCs), accredited MOOCs, and online distance learning are all methods of student education that are shifting the traditional parameters of university study. More and more universities are seeing the potential of distance learning as a means to broaden their teaching portfolio and expand student numbers, even when the infrastructure that makes up the physical university is full to capacity. The University of Leeds is one such institution that has an ongoing commitment to distance learning and the University's School of Geography is certainly no stranger to distance learning as a mode of delivery having offered an MSc in GIS, in collaboration with the University of Southampton, for almost 15 years.

An online distance learning programme offers students the flexibility to keep many aspects of their lives at a status quo whilst gaining a qualification, but it does come with challenges for students as they adapt to this different approach to study. But there are hurdles and lessons to be learnt for the educators too; guiding the student through their learning experience whilst getting to know a student, their capacities, their enthusiasms and their weaknesses is more tricky when a student potentially never steps foot in the UK, Leeds or the University.

Admission to a taught postgraduate programme is not necessarily based on academic qualifications alone. Prior work experience can sometimes tip the balance in favour of a student who is not considered a 'standard entry'. As a result, the diverse academic, cultural and experiential backgrounds of incoming students means that the transition to master's level study can be a gentle incline or a more uneven step. For those choosing to study online, and at a distance, experience has shown that the transition can be quite a rocky step and sometimes more early nurturing is required. Experience, and initial findings from the teaching enhancement project, would suggest that providing pre-sessional resources may be a way to help these students on their first step towards a successful postgraduate degree.

Keywords: Distance learning, transition, taught postgraduate, student experience, STEM.

1 INTRODUCTION

There is growing perception by academic staff that some taught postgraduate students struggle with aspects of transition to higher education (HE). This transition hiccup is not just about the academic literacy skills required to step on to a taught postgraduate programme but also about the skills and competencies required by students embarking on a degree needing strong technical and quantitative

data analysis capabilities. Current evidence is largely anecdotal but given the investment by universities and staff into delivering high quality taught postgraduate programmes, and against the backdrop of the changing landscape of HE and the diversity of the student community enrolling on programmes, this concern needs further investigation. Under the auspices of a teaching enhancement project, this paper will evaluate the extent of a 'skills gap' of incoming students within the context of on-campus and distance learning programmes offered within a School of Geography in order to identify next steps for enhancing the transitional experience of taught postgraduate students.

1.1 The Changing Landscape of Higher Education

Distance-learning programmes are on the rise in HE. What was once viewed as an unconventional route to study in higher education is fast moving towards the conventional. Massive Open Online Courses (MOOCs), accredited MOOCs, and online distance learning programmes are all methods of student education that are shifting the traditional parameters of university study. It has been speculated [1] that Universities are seeing the potential of distance learning as a means to broaden their teaching portfolio and expand student numbers, even when the infrastructure that makes up the physical university is full to capacity. There may be the perception that distance learning involves less teaching, or more efficient teaching, and a source of easy revenue generation but those who already deliver online distance learning programmes may disagree; robust academic and administrative support structures needs to be in place to secure academic success and enhance the student experience [2].

Until more recent times, a prospective student wishing to broaden their knowledge and acquire higher education qualifications would probably enrol as a campus-based student at a university on a full or part-time basis. Alternative study models have existed for many years, such as correspondence courses. In the United Kingdom (UK), the University of London broke new ground in 1858 with the establishment of the External System, reforming education access and opening up the possibility of gaining a degree without ever studying on-campus [3]. As a method of study, correspondence courses provided opportunities for those who had not been able to participate in the more conventional education system but they were not necessarily providing an equivalent experience that on-campus students might expect, offering limited interactivity and often aimed at a more niche market.

Over the last 50 years the Open University (OU) has been a pioneer in distance learning, asserting that it "changed the face of British higher education with its quality teaching materials, innovative pedagogy and exploitation of new technologies" [4]. Established in 1969, the OU augmented the learning experience by delivering television and radio tuition combined with correspondence courses and residential courses [5][6] and can be attributed to paving the way for distance learning to become a more accepted and frequently pursued route into gaining a higher education qualification.

Times have changed in a relatively short period of time to the benefit of those students who wish to study by distance learning. Approximately half of the world's population now has ready access to computers and the internet [7] and the Office for National Statistics [8] reported that 87.9% of adults in the UK (45.9 million) had accessed the internet in the 3 months preceding the survey. With technological and software advances enabling virtual learning environments, video streaming and interactive study experiences, such as discussion boards and web conferencing, the world of online distance learning is expanding. A recent study into the trends and patterns of distance learning among degree-awarding higher education institutions in the United States revealed that more than six million students took at least one distance course in 2015, almost 30% of students compared to 9.6% of students in 2002 [9]. It also reported that, in that same year, 14.3% of all students studied exclusively via distance learning courses. The study presents the headline figure that whilst overall distance enrolment has grown, on-campus enrolment has fallen by 5% since 2012.

1.2 Student Diversity

The distance learning community brings with it new challenges. An online distance learning programme offers students the flexibility to keep many aspects of their lives at a status quo whilst gaining a qualification, but it does come with challenges for students as they adapt to this different approach to study [10]. But there are hurdles and lessons to be learnt for the educators too; guiding the student through their learning experience whilst getting to know a student, their capacities, their enthusiasms and their weaknesses is more problematic when a tutor and a student never meet.

Admission to a study programmes is not necessarily based on academic qualifications alone. Prior work experience can sometimes tip the balance in favour of a student who is not considered a

'standard' academic entry, particularly mature and international students who may bring less traditional academic qualifications but are experienced practitioners of their discipline. This is particularly pertinent to many taught postgraduate students, many of whom are returning to education after a period of work in order to re-skill, or formalise their experience with an academic qualification, to improve their future employment prospects. In these instances, the diverse academic, cultural and experiential backgrounds of incoming students can mean that the transition to a higher level of study can be a gentle incline or a more uneven step and often requires a significant leap in academic skills [11]. The need to support incoming students to HE, particularly regarding academic and information literacy, has been explored in a number of studies in recent years [12][13], but these generally focus on the undergraduate and on-campus experience. Where students have unconventional academic backgrounds, or have been out of formal education for many years, induction and early formative feedback have been found to be vital [2][14]. For those choosing to study online, and at a distance, the potential for the transition to be a rocky step is more likely, and more early nurturing is required.

Given the diversity of taught postgraduate students it is entirely conceivable that there are some gaps in the discipline, or subject-specific skills of incoming students. The foundational modules of a study programme may assume students have no prior knowledge of the principles and concepts being taught but there may well be an expectation that students have the required science, technology, engineering or mathematics (STEM) based competencies to engage with the module content from the outset. Where discipline-specific competencies need to be strengthened then methods to support incoming students may need to be put in place [15] but reaching the baseline skills can be a steep learning curve for some students making the transitional experience overwhelming. If this is the case then it is important that the educators identify gaps and provide support early in the students' learning journey which, in turn, can improve student satisfaction and retention and ultimately contribute to academic success.

1.3 Evaluating the Student Experience

This teaching enhancement project is exploring whether pre-sessional resources, that are discipline-specific and content-based for particular programmes, may better support students in their transition to taught postgraduate studies and will use a mixed distance learning and on-campus cohort of students as a case study. Gaining an understanding of why some of these students decide to study online versus enrolling on the on-campus programme, and evaluating whether there is a difference in the technical and quantitative data skillsets of students embarking on a degree by these different modes of study, will provide a backdrop to the research. Assessing whether the students recognise that extra support may be needed in order for them to successfully 'step-up' to taught postgraduate studies, or whether they feel disadvantaged if certain skills are missing at the start of their studies, will provide further insight.

Results from this evaluation may inform on what additional resources might be developed for these students to support their transition. The project is in the preliminary stages of investigation but has the potential to open discussion in the wider arena on the extra challenges for taught postgraduate student with their diverse backgrounds and to share best practice on supporting the student as they embark on a degree by distance learning or on-campus.

2 METHODOLOGY

2.1 The Study Cohort

Prior to designing and developing additional resources to support the transition to taught postgraduate studies there is a need to consult with existing students to gain a better understanding of their experience of 'stepping-up' to a Master of Science (MSc) degree and an insight into what would have prepared them, or set clearer expectations, for their future studies. This evaluation was undertaken via a questionnaire to students taking modules in Geographical Information Systems (GIS) in the School of Geography at the University of Leeds, UK and includes students enrolled on a distance learning programme and on-campus programmes.

A taught postgraduate degree in GIS has a scientific core, requiring skills in the use of information technology, and good quantitative data analysis competency and therefore a student starting on this degree would be expected to have the same aptitude and capabilities as for many STEM subjects. A popular definition of GIS is that it is "a powerful set of tools for collecting, storing, retrieving at will, transforming, and displaying spatial data from the real world" [16] but, for many, GIS (or GIScience)

focuses on its scientific and applied basis, as in “the study of problems arising from the handling of spatial information in GI Systems, i.e. it entails finding solutions to problems associated with the use of GIS” [17]. Due to the applied and varied nature of a GIS programme, the students often enrol with a mixture of geographical, science, computing and mathematical backgrounds but not necessarily experience or competency in all.

The University of Leeds has an ongoing commitment to distance learning, as exemplified by the School of Geography which has been offering an online MSc in GIS, in collaboration with the University of Southampton, for almost 15 years. The School also offers a full and part time on-campus MSc in GIS, with students on other programmes within the School and in the wider University community attending some of these modules. There are synergies between modules taught online and on-campus including, where possible, content and tutor. Due to the different dynamics of the two programmes, comparable on-campus and distance learning modules are not normally run concurrently, nor are the cohorts combined to be taught as a single cohort, although there are occasions when an on-campus student may replace a module with the distance learning version under certain circumstances.

Given this backdrop of two cohorts of students (on-campus and distance learning) taking similar modules, these students were chosen as the study cohort to explore the ability and confidence levels in certain technical and quantitative data handling skills at the point of enrolment.

2.2 Data Collection

Initial findings were obtained via an online questionnaire, seeking students’ perceptions of their confidences in academic skills at the start of their studies and undertaking an audit of students’ information system and data handling skills. It is anticipated that responses from the questionnaire will provide insight into additional resources that might be developed to support students in their transition to taught postgraduate studies.

The views of 178 students were canvassed, comprising 95 on-campus taught students (across 4 programmes of study) and 83 students enrolled on the distance learning programme. The majority of on-campus students were studying full-time over a one year period; the timing of the survey was such that most students had just completed the taught element of their programme and were about to embark on their dissertation so were approximately two-thirds of the way through their study. The stage of study was less clear cut for distance students as there are four intakes a year (January, April, July and October); it is a part-time programme with exit points after one year (the Postgraduate Certificate award), after two years (Postgraduate Diploma award) or after three years (Master of Science award) with the addition that some students are taking one or more credit-bearing modules for continuing professional development. Regardless of the stage of study, or anticipated award, it was not felt necessary in this early investigation to categorise these distance learning students further as they have all undergone a similar admissions process and it is the skills at point of entry that were of relevance to the study.

When comparable programmes exist as both on-campus and distance learning, the motivation behind a student’s choice of one mode of delivery over another is an interesting question for programme leaders and teaching teams. In the questionnaire students were asked which factors had been important to them when selecting their programme of study. Distance learning students were also asked whether they had studied online previously. The possible responses included pre-selected options for reasons for choosing a particular programme and method of study but also included an open text box. Responses from this question may enlighten programme leaders on the thinking processes of students in their choice of degree, location, method of delivery and provide insight into recruitment trends and inform curriculum reviews.

Recognition by students of their ‘readiness’ for taught postgraduate studies and the extra support that they might need was explored via a series of questions asking students to rate their confidence level at the point of starting their first taught module and similarly rating their confidence at the current point in their studies. These questions focused on the academic literacy skills (for example, critical thinking and referencing) and institutional systems interfaces (such as the virtual learning environment and the library services). Institution-wide resources already exist to enhance programme-specific induction and orientation processes but feedback may be useful to inform on future developments.

Identifying the technical and quantitative data handling skills of students at point of entry may indicate where additional resources could be prioritised to support the students in their transition to taught

postgraduate studies. All students were required to select their programme of study before an audit of their skills was carried out to allow comparison between those enrolled on an on-campus programme and those on a distance learning programme. Students were asked to indicate their previous experience and competency in GIS, spreadsheets, databases, statistical software and programming and asked to suggest other resources that might support their skills baseline.

3 RESULTS

The survey is ongoing so a final analysis of responses cannot be reported but this section will provide an overview of select early indications. At the mid-point in the survey there had been a 13% response rate. 70% of the respondents were from the UK or EU, with the remaining 30% classed as International. The ratio of on-campus students to online distance learners was an even split. Over 80% of the distance learners had not studied online before. Table 1 summarises (at the mid-point) students' perceptions of their confidence in academic skills at the start of their studies and at the current stage of their studies. The numbers show the percentage of respondents who would class themselves as confident or very confident across a number of academic skills at these two points in time.

Table 1. *Students' perceptions of their academic skills: comparing the percentage of students who expressed 'confident' or 'very confident' in various academic literacy skills at the start of their studies versus the current stage of their studies. Survey date: 12/05/2017*

Academic Skills	% of Students Confident or Very Confident at the Start of Studies	% of Students Confident or Very Confident at the Current Stage	% Change in Confidence
Critical Thinking	39.1	87.0	+47.9
Writing Style	47.9	81.9	+34.0
Referencing	56.6	95.7	+39.1
Independent Study	78.3	82.6	+4.3
Time Management	52.2	73.9	+21.7
Adapting to Higher Academic Standards of MSc study	21.8	95.7	+73.9

Understanding the confidence levels of students in their academic literacy skills will provide some insight into the emphasis that needs to put into pre-sessional or induction periods. The early indication from the responses is that students have gained confidence in their academic abilities, across all areas, as their studies have progressed. An interesting statistic at this stage of the preliminary analysis is that only 21% of students expressed a level of confidence in adapting to the higher academic standards of MSc study (that is 78% of students expressed some concern) at the outset of their studies, whereas almost 96% expressed confidence at the current stage of their programme. This would suggest that the existing local and institutional academic skills resources offered to students in the induction and on-course period are, in general, providing the required support.

The results of the software and programming skills audit are given in Table 2. The numbers show the percentage of respondents who had experience of data handling software and programming prior to starting on their current programme, and where students had this experience they indicated their level of competency. Not entirely surprisingly, the early indication is that a large percentage of the students had some experience of GIS before they started their studies. All students indicated that they had use spreadsheet software previously, but there is a mix of competency expressed. Using database

management systems, statistical software and programming would appear to be skills and competencies that need further attention.

Table 2. Skills audit of students at the start of their taught postgraduate studies (as a percentage of the total respondents). Survey date: 12/05/2017

Skills Audit	Not used before (%)	Used before (%)	Basic Level (%)	Intermediate or Advanced Level (%)
GIS	13.0	87.0	50.0	50.0
Spreadsheet software	0	100.0	43.5	56.5
Database software	65.2	34.8	75.0	25.0
Statistical software	43.5	56.5	76.9	23.1
Programming	82.6	17.4	75.0	25.0

Once the survey has closed, a full and thorough analysis of the results will be carried out and will be used to inform on next steps of the project. This will include close consultation with academic staff, to help build a better picture of what additional resources are currently available and how they could be adapted or re-purposed to support these incoming students. Further consultation with students, via focus groups, may be carried out to get a fuller understanding of resources that they would have liked access to, either in advance or in the very early stages of their studies. Upon completion of the evaluation then the project will focus on the enhancement phase by designing and developing resources to supplement the induction and on-course resources with particular emphasis on the technical and quantitative data skills and competencies. These findings and sample resources can be shared in the wider university community where increasing focus on taught postgraduate study and an expansion in distance learning programmes is being considered.

4 CONCLUSIONS

This paper has reported on preliminary findings of a consultation into students' perceptions of the transitional experience onto a taught postgraduate degree requiring strong science, technical and data analysis skills. Regardless of whether students are on-campus or studying by distance learning, the results indicate that there are some gaps that do require extra support and that students recognise their lack of confidence in certain skills at the start of their studies. This would suggest that additional resources could be made available to the students as introduction, refresher or taster courses, before they step onto the standard induction and orientation activities of a STEM course, and that up-skilling these students in the pre-sessional period could enhance their experience and better prepare them for their upcoming programme of study.

Distance learning is a developing feature on the HE landscape and may well start to dominate. In years to come universities are highly likely to be still attracting large numbers of students for the on-campus experience but trends may suggest that an increasing number of students are deciding to study part-time and at a distance in order to maintain their job or reduce the disruption to family life whilst fulfilling their aspirations to obtain an academic qualification. Whether on-campus or part of this growing online community, student require and deserve high quality support in all aspects of their study and supporting a smooth transition, particularly for taught postgraduate students who often have widely differing experiential backgrounds, is critical to their future academic success.

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