Persuasive Technology in Education: Motivating Individuals to Enter Higher Education

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This research aims to explore the use of persuasive technology within the educational context. Technology has previously been applied to aid teaching and to encourage skills development and learning in various educational settings, primarily targeting students who are already in education. This research, however, addresses individuals who are not involved in education or who may choose not to continue in education: persuasive technology will be investigated for its potential to motivate these individuals to enter higher education if it is an appropriate option for them.

Persuasive Technology (PT) • Higher Education (HE) • Low Participating Neighbourhood (LPN) • Socio-Economic Classification (SEC)

1. INTRODUCTION

Persuasive technology can be defined as “any interactive computing system designed to change people’s attitudes or behaviour” [1]. Through persuasion, but not through coercion. Coercion implies force; while it may change behaviour, it is not the same as persuasion—which implies voluntary change. As it marries the traditional modes of persuasion, using incentives and information, with the innovative capabilities of devices to change users behaviour, persuasive technology is seen as a new paradigm that is applied within numerous domains, such as marketing, healthcare, environment and education. In this research, persuasive technology will be investigated within the education sector to motivate individuals to enter higher education and allow them to make an informed decision about their future. The main focus will be on individuals who come from what are termed Low Participating Neighbourhoods, who are under represented in higher education in the UK. These neighbourhoods are those where the participation rate of young entrants (aged 18 or 19) into higher education is low.

2. BACKGROUND – HIGHER EDUCATION PARTICIPATION RATE IN UK

The Higher Education Statistics Agency (HESA) in the UK reports that certain groups are under-represented in higher education (HE) relative to the HE population as a whole [2]. These underrepresented groups are:

(i) Students from state schools or colleges.
(ii) Students from specified socio-economic classes.
(iii) Students from Low Participating Neighbourhoods (LPN) based on the POLAR 3 method [3].

State schools (i) are all schools or colleges that are not denoted as ‘Independent’. Students from sixth-form or further education colleges, for example, are included as being from state schools. The socio-economic classification (ii) is taken from the National Statistics Socio-Economic Classification [4] and is shown in Table 1. Grades 4, 5, 6 and 7 of socio-economic class are under-represented.

Table 1 - Socio-Economic Classification

<table>
<thead>
<tr>
<th>Class</th>
<th>Socio-Economic Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Higher Managerial / Professional Occupation</td>
</tr>
<tr>
<td>2</td>
<td>Lower Managerial / Professional Occupation</td>
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<tr>
<td>3</td>
<td>Intermediate Occupation</td>
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<tr>
<td>4</td>
<td>Small Employers and Own Account Workers</td>
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<tr>
<td>5</td>
<td>Lower Supervisory / Technical Occupations</td>
</tr>
<tr>
<td>6</td>
<td>Semi-routine Occupations</td>
</tr>
<tr>
<td>7</td>
<td>Routine Occupations</td>
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</tbody>
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The POLAR 3 classification [3] is based on the HE participation rates of people who were aged 18 between 2005 and 2009 and entered a HE course in a UK HE provider or English or Scottish further education college, aged 18 or 19, between academic years 2005/06 and 2010/11. Five quintile groups of areas are formed for the classification ordered from ‘1’ (regions with lowest participation) to ‘5’ (regions with highest participation). Students whose home postcode falls within the a region with the lowest participation (Group 1) are denoted as being from a ‘Low Participating Neighbourhood.’

Graph 1 below uses data from HESA [2] to show a comparison of the percentage of young participants from underrepresented groups who entered higher education in enrolment years 2011, 2012 and 2013. In the enrolment year 2013/2014, the percentage of young entrants (school leavers aged 18 or 19) who entered higher education was 79.2% [2]. Out of these 79.2% of students, 89.7% came from State Schools or Colleges, 32.6% came from socio-economic classes 4, 5, 6 and 7, whereas only 10.9% of them came from a low participating neighbourhood.

Graph 1 - Underrepresented Groups HE Enrolment

![Graph showing enrolment data]

3. PERSUASIVE TECHNOLOGY IN EDUCATION

As persuasive technology (PT) has evolved, it has been applied within a number of sectors ranging from health care to commercial contexts. It has also been applied in the area of education, where persuasive technology has been designed to help with the teaching process and encourage learning. Examples of such technologies include software designed to develop a reading habit in children between 8 and 11 years of age [5], a mobile persuasive application developed for the HANDS Project [6] aimed to improve social skills development in young people with Autistic Spectrum Disorders, and the EuroPLOT Project [7] which introduced new concepts in teaching such as the use of Mobile Learning with school children and the use of robotic dolls to help Autism therapy and education.

3.1 PROBLEM STATEMENT

Projects using persuasive technology within the education sector have focused on teaching and learning processes. These projects are aimed at students who are already in education, motivating and enabling them to learn more effectively. In contrast, this doctoral research is targeting individuals who decide not to continue into higher education, encouraging them to think about higher education as an option. Persuasive technology will be investigated to focus on those who are not in education. Some individuals who fall into this category are those who come from a socially deprived background with low income, those who come from a certain Socio-Economic Classification (SEC) and/or come from a Low Participating Neighbourhood (LPN, neighbourhoods in England where the number of young entrants enrolling for university is low) and those who have not given much attention and thought to higher education due to their circumstances and lifestyle. Other main differences in participation rates by social class relate to family backgrounds, and also perceptions and costs involved and the benefits of higher education study [9]. This research will develop persuasive technology to inspire and encourage individuals to understand that higher education is an option to help them grow.

4. RESEARCH OBJECTIVES AND QUESTIONS

The main objective of this doctoral research is to investigate and design a persuasive technology that will allow individuals to be able to make informed decisions for a better career pathway and future. The persuasive technology developed will target the attitude and/or behaviour of the individual, eliminating any sceptical attitude they may have by providing sufficient information to raise awareness, motivating them to enter higher education if it is an appropriate option for them. In doing so, the research will seek:

- To investigate the reasons that trigger an individual's decision to not want to enter higher education; e.g. by identifying which component of the Fogg Behaviour Model (FBM) [8] is lacking.
- To ascertain factors which motivate students to enter higher education.
• To establish how the attitude of individuals from socially deprived backgrounds and Low Participating Neighbourhoods towards higher education can be changed.
• Explore possible strategies with the use of technology to help overcome the barriers and constraints faced by individuals to help them engage in higher education.

5. METHODOLOGY
Two exploratory studies have been carried out so far for this research. The first study involved interviewing 10 participants who came from a Low Participating Neighbourhood to find out what barriers and constraints they faced which led them to make the decision to not enter higher education. They were also asked what could motivate them to go into higher education and the role that technology played in their decision-making was explored.

The second study involved interviewing 10 participants who also came from a Low Participating Neighbourhood, but the difference was that these participants had recently enrolled into university. The reason for the interviews was to understand what motivated these individuals to make the decision to enter higher education and what factors might have prevented them from making this decision. The role that technology played in their decision-making was again explored during the interviews. The idea was to use the factors/reasons that motivated these participants as a starting point for understanding attitudes and behaviours that might be targeted by creating persuasive technology to be used with individuals who are in the education pathway. Participants in both studies came from similar backgrounds and life styles, thus it was easier to make a comparison between the two groups.

Each study consisted of two parts. The first part required participants to complete a demographic questionnaire; the second involved the participants taking part in an informal semi-structured interview where they reflected upon the choices they made after school/college regarding higher education. Both the questionnaire and interview were completed within the same meeting with the participant. The semi-structured interviews were audio recorded and took place immediately after the participant filled out the questionnaire.

The questionnaire was used to understand what background the participant came from, which may have led to the choices he/she made. The aim of the questionnaire was to find out what ethnic background the participant was from, their home postcode (to confirm that they were from a Low Participating Neighbourhood) and what usage the participants and their parents made of social media/technology.

5.1 PARTICIPANT RECRUITMENT
Participants were recruited by using convenience sampling in West London. These participants consisted of students who had taken A Levels/ BTEC or any other Level 3 qualification but did not go to university. All participants were over 18 years of age. Before the meeting for the study, all participants were given an information sheet, which briefed them about the project, and then were asked to fill out and sign a consent form. The information sheet clearly stated that there was no anticipated risk to participants for taking part in this study, and that their participation was voluntary.

5.2 QUALITATIVE DATA ANALYSIS
The audio-recorded interviews were transcribed for analysis purposes. The qualitative data gathered from the 20 interviews were analyzed on the basis of an approach suggested by Saldana (2012). This type of analysis consisted of a systematic coding of data, where the “codes” are broken down in a way to identify relevant patterns.

First, the transcribed interviews were studied to look for distinct concepts and comments made by the participants that answered the research questions. The comments and answers given by the participants that related to the research question were marked/labeled, also referred to as ‘coded’. Next, coded segments of data for each research question were studied in detail to look for more general categories, patterns and ‘themes’ that emerged from the data. This lead to the creation of sub-categories within each research question category. Second, the transcribed interviews were studied in detail, and any additional information mentioned by the participants that may improve this research further was coded.

5.3 CODING
The coding was done using the qualitative data analysis software ‘NVivo’. The analysis was carried out using a combination of deductive and inductive coding approach, also known as a hybrid approach.

Having the research questions in mind, the first set of codes was created; Deductive coding was used to do this. For example, categories for ‘barriers that stopped participants entering HE’, ‘what could motivate the participants to enter HE’ and ‘what role technology played in the participants decision-making’ were developed initially. So whenever a participant spoke about any of these three research questions, their comment was added, or ‘coded’, under the related research question category. Each coded elements within the three categories was then looked upon for similarities and differences to
find a pattern or theme within the category. The similar answers within the category were grouped together to create sub-categories.

In addition, inductive coding was used to complement the deductive approach. It was used to explore additional areas, which the participants mentioned that may have led to the decision they made regarding higher education. Any factors that could have impacted the participants’ decision-making making, what their attitude was towards higher education when they were in school/college, and/or peer pressure related matters; all such factors were coded next (after the research question codes). Once coded, all the codes were read and looked upon for similarities and differences. The similar answers were grouped together to form a sub-category within a code.

If a participant made the same and/or similar comment twice during their interview, both the comments were coded, but it was only counted as one instance. For example, if a participant mentioned twice that ‘finance’ hindered their decision to go to university, then both these comments were coded, but were only counted as one instance as they came from the same source. On the other hand, if the same participant made two different comments for a certain topic during their interview, both the comments were coded under different sub-categories, and were counted as two different instances. For example, if a participant said that ‘experience is more important’ and ‘I might not get a job with a degree’, then both these views were counted as separate instances, although it came from the same participant.

6. INITIAL RESULTS

After comparing all the codes derived from the transcribed interviews for each study, the similar codes were grouped together to find emerging patterns and themes. The final coding scheme for both the studies had the following main categories:

(iv) Reason for entering/not entering Higher Education.
(v) What could motivate the participant to enter Higher Education.
(vi) Use of Information Technology (IT).
(vii) Attitude towards Higher Education.
(viii) Parents’ attitude towards Higher Education.
(ix) Future career plan.
(x) How Higher Education was promoted in their school/college.
(xi) Peer pressure.

Each of these categories had a number of subcategories and codes. The most important categories that helped answer the research questions were ‘Reasons for not entering Higher Education’, ‘What could motivate the participant to enter Higher Education’, ‘Attitude towards Higher Education’ and ‘Use of Information Technology (IT). The remaining categories served the purpose of collection of additional information that helped enlighten new areas and/or helped interpret the research questions further.

6.1 BARRIERS AND CONSTRAINTS TO ENTER HIGHER EDUCATION

The most common reason for not entering HE amongst the participants in study 1 was their view that a job after completing their degree was not guaranteed. Results from the first study were similar to the ones obtained by the authors of ‘Social Class and Higher Education’ [9]. The biggest barrier and discouraging factor individuals face when making the decision to go into higher education along with finance) is their belief that they will not get a job related to their degree after they graduate, and thus will end up wasting their time in higher education. They did not have any evidence for this; it was just their perception. There were also financial concerns linked to borrowing money and future debt. Parents’ attitude towards higher education also played a vital role in the individual’s decision making. Two of the female participants parents did not allow them to go into higher education, while some of the other participant’s parents discouraged them from entering. There were also parents who were not concerned about whether their child goes into higher education or not, they supported the child with what decision they make for themselves without offering any advice or guidance. On the whole, these individuals appeared to have lower levels of confidence about their ability to succeed in higher education, getting a qualification or even making a decision regarding their future career, they were unsure of what to do. Examples of what the participants said were:-

‘I’m too indecisive. I fear that if I go and do a three year course, which cost 27 grand, I am going to change my mind again and want to do something completely different.’

‘I know I am going to spend about 27 or 28 thousand pounds, so I would rather work three years and probably make double or triple of that money.’

Such individuals need advice about the career options that are available to them. They are only thinking of the short term and making money at present; they do not consider how a qualification will help them earn more in the long run. Persuasive technology could therefore be applied here to change the attitude of such individuals.
6.2 MOTIVATORS TO ENTER HIGHER EDUCATION

In contrast to what study 1 participants mentioned as a barrier, ‘it is hard to find a job with a qualification’, participants from Study 2 claimed that they decided to enter higher education to become independent and build a career to make a better career pathway. They said they knew that they would be able to get better jobs with a degree. One of the participants said –

‘With a degree you just set the bar so high and hopefully if I get the best degree I know I will be outstanding’

Another motivator stated by a few of the participants was making their parents proud. As these participants were ‘First Generation Students’, students whose parents have not graduated with a degree and are the first ones from their family to go to university, their parents motivated and encouraged them to go into higher education. These participants felt responsible for going to university, graduating and setting a benchmark for their siblings and other family members. In general, parent’s attitude towards higher education is a significant factor that influences their child’s decision to enter higher education; parents who are positive will persuade their child since a young age to enter higher education, embedding into their minds how beneficial higher education is.

6.3 HELP AND GUIDANCE

‘Help and Guidance’ was a common theme that emerged from both studies. Study 2 participants confirmed that students need help and guidance to make a decision about going into higher education and starting the application process; all the participants said they would not have been able to apply without having guidance and help. When help was not available, these participants took the initiative to look for guidance and seek information to help with their decision-making.

However, participants in study 1 were not concerned about seeking support and information themselves: they wanted help to come to them. The majority of them did not avail themselves of the ‘Career Advisors’ support and advice. They either felt it was no use or had already made their decision to not enter higher education so did not invest time in understanding what options were available to them. These individuals might have at least thought of higher education if they had an advisor who would offer tailored guidance, advising them on what the best career option is for them, someone who would approach these individuals themselves rather than the individual having to find guidance. As they did not have anyone approach them, these individuals did not make an effort to look for help either; this resulted in them leaving the higher education pathway. The information available online is seen as being too general and overly complex, discouraging Study 1 type of individuals to research on their own.

7. MAIN CONTRIBUTIONS

It is vital that every individual has the opportunity to make an informed decision about his or her future for a better career. Although many of these individuals do get the chance to explore whether higher education is the right path for them, they do not seem to take advantage of the information available to them. They fail to participate in higher education either due to family background, parents attitude, socio economic status or even because of the area they live in (those from Low Participating Neighbourhoods). Could we then say that are individuals are disadvantaged from the start just because of the neighbourhood they were born in? This research aims to understand and help individuals who have come from such a background where they do not pay attention to the opportunities available to them; they are content with the current routine job they are offered. These individuals need guidance in order to change their behaviour/attitude and make decisions to build a better future. By understanding the users behaviour, situation, perception, cognitive and behavioural capabilities, this research will form a background of HCl and software design disciplines to inspire new design directions for persuasive technology within the education sector. These will be used to help encourage the targeted individuals to have sufficient information to make informed decisions about their future.

8. REFERENCES


4 Socio Economic Classification (NS-SEC) Definitions, UKPIs:: "HESA - Higher Education Statistics Agency - HESA - Higher Education


