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TRIALS AND TRIBULATIONS OF TEACHING PRODUCT DESIGN TO NON-DESIGNERS

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ABSTRACT
This is our story, our trials and tribulation of teaching and facilitating the learning of product design to an ever growing pool of non-designers wishing and hoping to covert. The paper discusses the various techniques such as Peer Assisted Learning (PAL) etc, as the tools used in this research exercise. Timed exercises and the encouraged collaborations within the various arms of Design Education from BA to BSc and BEng have been encouraged. Even successful and willing alumni of the university have been approached and encouraged to interact with the students.
This study is based on students studying in our Design and Engineering Department, in the Faculty of Science & Engineering. The whole exercise complemented the already stringent entry procedure of screen every applicant which has led to improved student retention and a more fulfilling student journey and experience.

Keywords: Design Education, Product Design, Innovative Teaching, Portfolio Content.

1 INTRODUCTION

The interest in Design, especially in Product Design, both in terms of careers and educational path has been rising constantly.
The real culprits for the huge interest are both Media and certain companies and their products, namely Apple and people like Steve Jobs and Jonathan Ive etc. Many young people strive to those ideals and go on to university to study primarily Product Design from A levels in Design and Technology and/or Art and Design.
However, the realities of higher education, sometimes shakes the rosy expectations of simply becoming a designer. Just because one can either sketch or use CAD software, one cannot become a designer. The anti-climax happens, once technical topics are introduced, topics which are wrongly labelled as maths by many students. Technophobia sets in. A trait which has its roots in the pre-university education. There are no technical contents in the A-Level Product Design and many students do not take any science subject at A-Levels either. Educating such cohorts require huge added value. Our subject contents and portfolios has been successful so far but it is constantly becoming more challenging year on year.
Higher education was already going through a cultural change due to student mentality and expectations. This only became more important and apparent with the increase in fees especially now that every university is charging the maximum fees whether at the top or bottom of the league tables. There was a dip in numbers initially after each increase in fees from zero to £3,000+ to the current £9,000+. However, the following academic year the numbers would have recovered. However, this time, the official statistics indicate a possible 7000 less application. Thus, it is imperative to have a very direct comprehensive recruitment marketing strategy making sure that once the students are enrolled, the wastage rates (drop outs) are reduced and in best case scenarios completely eliminated. Of course, it must be emphasized that every course has a magic number of drop outs. It is assumed that the readers of this article also know that even in the days of free education and plentiful number of applicants, the reduction of wastage rates were always our duty and of great concern especially if it seemed to peak at any time. However, it has become more of an issue and concern nowadays with the advent of concept of student experience and student satisfaction surveys as well as the considerably increased fees. Numerous studies have been conducted over long periods on processes and circumstances by which student retention could be improved. Whole review papers could be written on these processes which is outside the scope of this article. Suffice it to say that many articles and essays on the topic have been studied.

Many of the models and suggestions have been implemented in the past with varying success. For example, Tinto [1] states that the dimensions and consequences of college student attrition and features of institutional action to deal with attrition are discussed. Patterns of student departure from individual colleges as opposed to permanent college withdrawal are addressed. After synthesizing the research on multiple causes of student leaving, a theory of student departure from college is presented based on the work of Emile Durkheim and Arnold Van Gennep. The theory proposes that student departure may serve as a barometer of the social and intellectual health of college life as much as of the students' experiences at the college. The quality of faculty-student interaction and the student's integration into the school are central factors in student attrition. Attention is directed to features of retention programs, including the time of college actions and variations in policy necessary for different types of students and colleges. It is suggested that effective retention lies in the college's commitment to students. The content, structure, and evaluation methods for assessment of student retention and departure are considered, along with the use of assessment information for developing effective retention programs. According to Cabrera and Nora and Castañeda [2] several theories have been advanced to explain the college persistence process but only two theories have provided a comprehensive framework on college departure decisions. These two theoretical frameworks are Tinto's [3, 1] Student Integration Model and Bean's [4, 5, 6, 7, 8, 9] Student Attrition Model. Cabrera et al [2] have validated Tinto's model across different types of institutions with differing student populations. In turn, the Student Attrition Model has also been proven to be valid in explaining student persistence behaviour at traditional institutions while modifications to the model have been incorporated to explain the persistence process among non-traditional students. Insofar as the two theories have attempted to explain the same phenomenon, no efforts have been made to examine the extent to which the two models can be merged to enhance our understanding of the process that affects students' decisions to remain in college. However, Cabrera, Castaineda, Nora, and Hengstler [10] have provided evidence that there is considerable overlap between the two theoretical frameworks. Taking these findings one step further, this study attempts to document the extent to which these two theories can be merged in explaining students' persistence decisions by simultaneously testing all non-overlapping propositions underlying both conceptual frameworks.

Student retention has become a challenging problem for the academic community: therefore, effective measures for student retention must be implemented in order to increase the retention of qualified students at institutions of higher learning. Lau [11] suggests that institutional administrators, faculty and students play a vital role in improving student retention. For instance, institutional administrators can help students stay in school by providing them with the appropriate funding, academic support services and the availability of physical facilities, in addition to the effective management of multiculturalism and diversity on campus. Faculty members can help to maintain a positive teaming environment for students by using multimedia technology and innovative instructional techniques such as cooperative and collaborative learning in the classroom. Ultimately, the success of college retention depends on the students themselves. Therefore, students must be motivated to participate actively in their own learning process.

Lenning [12] tried clarifying the various concepts of retention and attrition within a unifying conceptual framework, Co synthesize the research on retention and attrition, and examine the implications of the research for postsecondary administrators and researchers. Retention and attrition research pertains to both the percentages of students who complete programs and the reasons for completion or attrition. Practical considerations concerning attrition and retention that administrators should consider were briefly addressed. After clarifying terms, (including persister, stopout, dropout, retention, and attrition), that appear to affect attrition and retention are described, and activities and strategies that may help reduce attrition rates are recommended. Theoretical and empirical literature was reviewed, as were attempts to classify retention. A new structure for classifying retention has been proposed, and indicators and measures for attrition and retention have been described.

According to Wild and Ebbers [13] student retention is critical to the community college environment. They elucidate that in order to understand student retention issues in community colleges, it is necessary to identify the retention goal of the institution, the criteria, definitions, and data needed to monitor progress toward the retention goal. Only then can a retention program be designed and implemented. A plan to establish a college-wide retention program is included. They also provide an overview of past and present research pertaining to student retention.

Reasons [14] has reviewed recent research related to the study of college student retention, specifically examining research related to individual student demographic characteristics. The increasing diversity of

undergraduate college students requires a new, thorough examination of those student variables previously understood to predict retention. The retention literature focuses on research conducted after 1990 and emphasizes the changing demographics in higher education. Research related to a relatively new variable—the merit-index—also was reviewed, revealing potentially promising, but currently mixed results.
Here the aim was to wipe the slate clean and start with a fresh canvas. The author wanted to think to use the jargon, outside the box. The research was done in the Department of Design and Engineering within the Faculty of Science and Technology.

2 METHODOLOY

After some soul searching, retrospective thinking and observations, it was decided to level the playing field, some might say move the goal post, and some might even say take our level to the student's level. The common fact to the current students, whether supplied through student support or bought by themselves is technology, mainly tablets and smart phone. The technology has already been widely embraced by the student. The next step was have role models, course champions, someone whom then students could look up and warm to. Hence the PAL (Peer Assisted Learning) Project was resurrected. Mature students and higher level students were encouraged to nurture the weaker lower level students. Team working was widely and vehemently promoted. Regular meetings gathering were set up with links on the social media and forums. Live projects have run as competitions between the first and second year students. Cross framework design and engineering collaboration and competitions have been encouraged. BA students have been given the opportunities to contribute to BSc students and vice versa. Even the new BEng cohort were encouraged to contribute.
Students have a studio days in which they are given a brief at 9 am and they need to come up with solutions and manufacturing plans by 5 pm. The sessions were initially run strictly through the project tutors but gradually they were put in charge up to the point where the academics acted as arbitrators. Sometime projects were resurrected in order to achieve optimization. Sometimes different levels and design groups were mixed. Guest clients from other courses within the school were used. The aim was to simulate the real world and promote growth and developments as well as time keeping and the professional etiquette.
Ex-students in industry and students on placements have been called upon to help the freshers ride the initial turbulent tides of higher education.
All this has to been done in the light of the balanced work load which to be honest is the most difficult challenge.

3 DISCUSSION

In order to achieve what was set up, the system had to work seamlessly but the student body is many things but seamless. In many cases, it takes real courage and dedication on the part of the academics involved, to be complementary and encouraging. As academics, you understand the importance of this and hence it is done. Another challenge has always been that of how do you persuade industry to want to be involved with live projects. It is understandable that a company would look at the time involved and would ask the question what is in it for me?
One of the issues faced is the fact due to dropping of the tariff points sometimes the students do not have the real underpinning for design. However, it was hoped that by throwing the students at the deep end, it prompted a reaction. They are encouraged and interaction with live projects could be useful.
Many obstacles were traversed by selling the idea to the companies. The preverbal carrot, was the opportunity to tap into so many young, vibrant, fresh and untapped minds? They could reap the benefits of new ideas and designs and concepts generated especially if they would set the design briefs. The incentives for the students came in the form of assessments, prizes and possibility of placement not to mention the opportunity of seeing their designs becoming commercial realities.
Students could develop, test and submit their ideas and concepts online.
Students were encouraged to twit about their ideas and then discuss their concepts on Facebook. They were thought of as shop owners and had to display their merchandise digitally. The style and process was left to them to consider and implement.
Ultimately a Who Wants to be a Millionaire theme competition was run. This gave the other students to be involved in the ask the audience part. In the ask a friend, groups were allowed to interact together.

All these were easy to implement as the current generations are very digitally adept. However, there were issues to do with copy rights, patents and Intellectual Properties, IP, as well as cyber security. It may have been a totally different approach and interaction, had cash prizes were involved. However, for the sake of not getting into financial implications, no cash was involved.
Cross fertilization across the whole framework was the key from the start. Encouraging students from different disciplines to cooperate requires a tight control and a willingness on the part of the academics as well as the students. A commitment which is difficult especially as each group wanted to stick together and sees the cooperation as an added activity with no academic credits for their efforts.

4 CONCLUSIONS

The approach proved to be a success for all parties involved from the student engagement and satisfaction to fulfilment of the company requirements. Above all also it has improved the student retention considerably. Of course, it must be noted that many other factor have also contributed to the retention rates, namely correct screening of applicants in the first place during the open days and interviews. The dedication of the academics and admin has played a big role in the retention rate. The digital experience of the students and their interaction with it was also a key to rate of implementation. Other logistic and legal issues was checked by the academics but the students had to go through the process not knowing that it had been checked by the academics, or did they…
Implementation of any project and process which is outside the remits of course validation is always difficult especially if the academic credits assigned are not well defined and not well understood by the students. Therefore a review of the accreditation of the courses and documentations are needed.

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