

# 1.Problem Definition

The greatest measure of the quality of learning in education is students' assessment successes which makes it an objective point for both educators and students. With the impact of developing technologies, understanding of education is transforming from conventional in-class learning to online learning platforms. This transformation creates opportunities for educators to make innovations by developing new strategies that will lead to enhanced student success.

In order to consider all the factors that are interacting with educative aspects of an online learning platform, components of the platform can be investigated under 2 correlated sections with distinct purposes.

- First one aims to introduce the content of a module to the students by using various activities and resources focused on teaching. Performance of first part is substantially dependent on factors such as quality of the teaching material, design of the framework of modules, suitability of platform's teaching approach for students and how user-friendly is the platform's interface.

- Secondly, assessing student success is another fundamental requirement for online courseware which can be optimised by deciding the correct structure and types of assessments based on the nature of the modules.

From a business perspective, the interactions of the VLE as a product and registered students as the customers determine the student success (student assessment scores) which are the objective parameters of the business problem at hand. Therefore, continual improvement of the VLE as a product is a must for the business to succeed in the online education landscape.

The key elements driving higher levels of student achievement are learning facilities that successfully align with each student's learning patterns. The challenge is to spot the personal need of each student and to provide a tailored range of solutions personalised to their needs. The concept to be used as a strategy to address this is the personalisation of learning processes. Virtual Learning Environment inherently supports the implementation of the personalised learning experience for registered students. The online data gathered by the VLE combined with each student's personal data gives an opportunity for in-depth analysis of student preferences and learning patterns. When built by analyses of student and VLE data, personalised learning can produce targeted learning experiences for each segment of students registered on VLE.

# 2.Problem Structure

Using the Open University Learning Analytics dataset, initially, demographics that are more likely to be related to student success are explored and findings revealed that three characteristics listed below are significantly related with assessment score levels of students in the modules. students' final results (Withdraw – Fail – Pass – Distinction) and final weighted average marks based on assessment scores are used as student success criteria.

- Educational Background: Students are divided into 5 categories below starting from the group most likely to be more successful than the others.
  - o Students possessing Post Graduate Qualifications
  - o Students possessing Graduate Qualifications
  - o Students possessing Level or Equivalent Qualifications
  - o Students possessing Lower than a Level Qualifications
  - o Students without Formal Qualifications
- Age Band: Students are divided into 3 categories starting with the group most likely to be more successful.
  - o 55 years old or older students
  - o 35 to 55 years old students
  - o 35 years old or younger students

- Deprivation Index: Students are divided into 3 main categories again most likely to be more successful than the others.
  - o Students located at a district with Deprivation Index in 60% - 100%
  - o Students located at a district with Deprivation Index in 30% - 60%
  - o Students located at a district with Deprivation Index in 0% - 30%

### 3.Key Analysis Findings

#### i. Demographics Exploratory Analysis

According to the results of the analysis process, highly educated, old students who are located in an area that has a higher deprivation index during the presentation of the course are statistically more likely to end up with a higher final result.

Using these 3 demographics, 3 different student profiles are defined as follows:

- High Profile Students:
  - o Post Graduate or Graduate Qualifications
  - o 55 years old or older
  - o Deprivation Index in 60% - 100%
- Average Profile Students:
  - o Level or Equivalent Qualifications
  - o 35 to 55 years old
  - o Deprivation Index in 30% - 60%
- Low Profile Students:
  - o No Formal Qualifications
  - o 35 years old or younger
  - o Deprivation Index in 0% - 30%

#### ii. Targeted Learning Model

The analyses findings of the interaction between students' online activity patterns and final marks among these 3 groups indicate that particular activities are more beneficial for particular groups. It's important to note that in the dataset there are 20 different activity types with usage amounts measured by total clicks in corresponding activity pages.

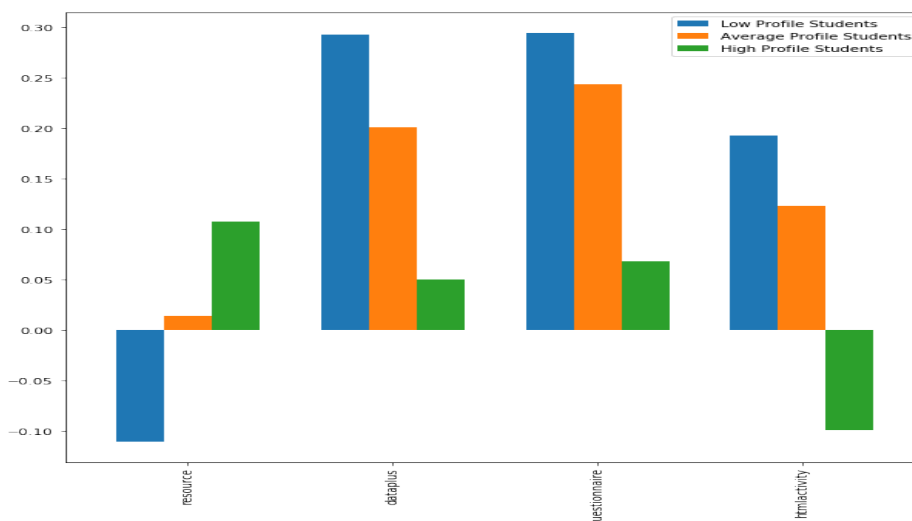


Figure A: Correlation of Student Demographics vs VLE Activity Type

Figure A illustrates the correlation measure which is the rate of return by involving in an activity type in terms of the final mark. It is possible to conclude that low profile students are more likely to benefit from 'dataplus', 'questionnaire' and 'htmlactivity' pages and it is recommended that more of these resources should be used in the targeted learning model of low profile demographics groups. Whereas, for higher profile students more resource page activity types should be targeted.

## 4.Recomendations

The findings of the analysis suggest that certain activity types must be targeted to student profiles that would benefit the most. A recommendation system that personalise the VLE experience to each student depending on their demographics is found to be suitable for the future success of VLE. This can lead to a significant improvement in the quality of the students' learning process. Upon registration of each student, the recommendation system can provide, in real time, suitable VLE resources for each registered course.

VLE should implement a data driven approach to not only to contribute to student success but also to strengthen its market presence in the online education landscape.

- The student demographics can differ in every presentation of the modules hence, VLE should perpetually provide appropriate course materials in the form of online learning activities in order to meet the changing individual needs of the students.
- Gathering a wider range of student demographics data is highly essential to get more insights about student's learning patterns which lead to implementation of more personalised strategies to contribute to student achievements.

## 5.Conclusion

In conclusion, the study started with key observations on the structure of VLE which are used to define the business problem. The relation between student demographics and success is explored to provide a foundation to build high, average and low level profiles on. By examining the learning patterns of every profile, activities that are most likely to be beneficial for particular student profiles are determined to develop strategies to improve student success. Using the targeted activity types for each student profile, strategies are recommended to effectively allocate the resources belonging Open University in order to contribute to the continuous improvement to the student learning experience.