

# Students' Expectations Toward Features of Learning Analytics System

Muhd Khaizer OMAR<sup>a\*</sup>, Nurfadhlin Mohd SHAREF<sup>b</sup>, Masrah Azrifah Azmi MURAD<sup>b</sup>, Evi Indriasari MANSOR<sup>b</sup>, Nurul Amelina NASHARUDDIN<sup>b</sup>, Normalia SAMIAN<sup>b</sup>, Nur Raihan Che NAWI<sup>b</sup>, Noreen Izza ARSHAD<sup>c</sup>, Waidah ISMAIL<sup>d</sup>, Faaizah SHAHBODIN<sup>e</sup>, & Mohammad Hamiruce MARHABAN<sup>f</sup>

<sup>a</sup>*Faculty of Educational Studies, Universiti Putra Malaysia*

<sup>b</sup>*Faculty of Computer Science and Information Technology, Universiti Putra Malaysia*

<sup>c</sup>*Positive Computing Research Center, Institute of Autonomous Systems, Universiti Teknologi PETRONAS, Malaysia*

<sup>d</sup>*Faculty of Science and Technology, Universiti Sains Islam Malaysia, Malaysia*

<sup>e</sup>*Centre for Academic Excellence and Scholarship, Universiti Teknikal Malaysia Melaka, Malaysia*

<sup>f</sup>*Vice Chancellor Office, Universiti Sains Islam Malaysia,*

\*khaizer@upm.edu.my

**Abstract:** Learning analytics depicts the process of assessing, evaluating, and measuring student performance and the effectiveness of the teaching and learning process delivered by educators. The objective of learning analytics is to optimize students' learning by maximizing the pedagogical technique, assistive technologies, and cognitive abilities of learners. It is argued that the learning can be varied and subjective, however, with the use of technology, big data application, and machine learning, the process of learning can be empowered through learning analytics. This whole ecosystem proves to be the best practice in understanding student learning needs in tangible ways. The researcher employed descriptive and correlational studies to determine the relationship between learning analytics features and studied variables. Three dimensions of learning analytics were involved in the study: summative, real-time, and predictive. A set of questionnaires was distributed to 350 students enrolled in various programs at Universiti Putra Malaysia. Based on the results, it was found that demographic profiles of the respondents include age, gender, type of student, credit hours intake, concern on achievement, learning preference, and learning motivation contributed significantly to learning analytic features when ANOVA and T-Test being employed in the analytical procedures. Our finding also revealed that there was a strong and positive direction of learning analytic features based on the Pearson Correlation report. In summary, the current study unveils the influence of demographic characteristics of learners on learning analytic features. It is apparent from the findings that the learning analytics features shall consider the extrinsic and intrinsic values of the learners that include assistive technology, learning performance, and motivation. With a blend of values in understanding learning analytics study, the extensive study related to learners profiling is necessary to empower the learning experience comprehensively.

**Keywords:** Students' expectations, learning analytics, students' profiling, big data, machine learning

## 1. Introduction

Formal education has evolved in a myriad of ways. From conventional and traditional teaching method where educator plays the central role to Massive Open Online Courses (MOOCs), virtual reality and blended learning, just to name a few; advance pedagogical methods for content delivery. Additionally, educators have been pushed to integrate technologies in their teaching and learning procedures (Beldarrain, 2006). Not only the preparation and investment of technology, but educators are also spending many efforts in designing curriculum that meets technology requirement to ensure learning 'happens'(Lee & Yuan, 2018).

It is notable, the meaningful learning experience occurs when there is adequate interaction between teacher and student. Abundant efforts have been expanded by educators to design the curriculum that ensembles the values of that interaction (Elias, 2011). The crux of the education process

has always been placed to the use of technology to enhance interactions. Hence without the right tools and technologies, the process of learning might be tangle and disconnect from the learning objective.

The term 'learning analytic' varies, depending on the context and field of study. Therefore, understanding the extent of the learning effectiveness is vital to flourishing the holistic learning ecosystem. To scrutinize the learning effectiveness, learning analytics has been adopted to exaggerate the aforementioned issues in education. This research was initially carried out partially from the whole learning analytic project that includes the development of a chatbot, dashboard, and playbook to investigate the learners' characteristics and profiling. Inferential analysis was undertaken to determine relationships that exist between demographic profiling of the learners and learning analytic features.

## **2. Methodology**

In this study, data was collected by utilizing a survey research design in a form questionnaire. The implementation of a descriptive quantitative survey and correlational study was done by selecting 500 students from Universiti Putra Malaysia. They were selected using a random sampling technique. 500 questionnaires were distributed and 350 respondents (70%) completed the survey which was valid with information and utilized in this research. The distribution process as well as a collection of questionnaires took almost a month to be completed. A descriptive and inferential analysis approach was used in this study to interpret the data obtained, which were mostly categorical.

## **3. Results**

The findings of this study reveal that there is a strong correlation among learning analytic features: summative, real-time, and predictive. Each item that categorizes under the features describes important indications of learning analytics environment in a Malaysian university. Students' age, gender, types of student, credit hours intake, concern on achievement, learning preference, and learning motivation are those contributors to the success of learning analytics. In addition, the researchers divided these characterizations into two types of values: extrinsic and intrinsic values. Signals were posted in the findings depicting the parameter of characterization of learners is vital to construe learning analytics ecosystem.

## **4. Significance of Research**

Learning analytics is imperative in the era of digitalization and online learning environment to maintain the balance of teaching and delivery units for achieving success in an academic context. It is feasible to build a learning analytics system that able to capture data, however, more importantly, to discern the characterization of learners. Understanding learners through profiling their behaviors and preferences has contributed to the important finding of the study and neglecting these factors will produce a detrimental effect on the overall learning analytics study. Researchers are continuing to measure the impact of learning analytics application teaching and learning, and customization of data captured in learning analytic tools to combat the run-off from providing a relevant learning experience to students.

## **Acknowledgements**

This study was funded by the Malaysian Research Grant University titled Enhancing Education for Human Capital Development through Establishing Future Learning Ecosystem (UPM/800-4/11/MRUN/2018/5539210). Appreciation also goes to Universiti Putra Malaysia (UPM), Research Management Centre (RMC), and the Innovative Learning Sciences Research Centre of Excellence (INNOVATE), UPM for the coordination and distribution of financial support for this study.

## **References**

- Beldarrain, Y. (2006). Distance Education Trends: Integrating new technologies to foster student interaction and collaboration. *Distance Education*, 27(2), 139–153. <https://doi.org/10.1080/01587910600789498>
- Elias, T. (2011). Learning analytics. *Learning*, 1-22. Retrieved June 9<sup>th</sup>, 2021 from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.456.7092&rep=rep1&type=pdf>
- Lee, R. M., & Yuan, Y. S. (2018). Innovation education in China: Preparing attitudes, approaches, and intellectual environments for life in the automation economy. In *Higher education in the era of the fourth industrial revolution* (pp. 93-119). Palgrave Macmillan, Singapore.