The Roles of University Teachers' Attitude Towards Learning Analytics in Higher Education Institutions: A Concept Paper

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ABSTRACT

The use of technologies for teaching and learning is evolving at every level of education worldwide, including Higher Education Institutions (HEI), particularly in the universities. Such evolving technologies also include Learning Analytics (LA), which analyses data obtained from students' online interactions with various technologies used for teaching and learning in online classes and uses such data to provide feedback on learners' academic progression. To ensure integration and get the best out of using technologies like learning analytics to support teaching, university teachers (lecturers) are expected to have a positive attitude towards using learning analytics in their online teachings since teachers are the central agent for bringing about the required change in terms of technology integration in schools. University teachers' attitude entails engaging in teaching and learning using relevant technological tools like computers, the internet, smartphones, etc., and having the right feelings, excitement and understandings of the tools and how to make use of the tools for effective teaching and learning in schools. University teachers' attitudes toward using technology for supporting teaching is an important construct that educators use for determining the rate of using technology in schools. This paper aims to lay out the concept of university teachers' attitudes towards using learning analytics in HEI to achieve effective teaching and learning and provision of data-driven feedback to students.

Keywords
Teachers' Attitudes; Lecturers; Learning Analytics; Higher Education Institutions

Introduction

The application of Learning Analytics (LA) in higher education institutions has been rising in recent years, and subsequently, research in the area is equally on the increase. Learning Analytics is defined as "the measurement, collection, analysis, and reporting of data about learners and their contexts, for understanding and optimising learning and the environments in which it occurs" (Long & Siemens, 2011).

Learning analytics is an area of technology-enhanced learning that is meant to assist teachers and institutions of learning at all levels to access students' data from which academic decisions and actionable outcomes in terms of feedback can be produced to achieve desired educational objectives (Soltanpoor & Branch, 2018). LA is also an aspect of educational research that draws from diverse disciplines like information and communication technology, educational science, psychology, sociology, personalised and adaptive learning, recommender systems, and educational data mining (Kollom et al., 2021; Soltanpoor & Branch, 2018).

Basically LA consists of software and tools that display academic information on how students are engaged in learning. LA is designed to enhance teaching and boost students' academic success (Gazulla & Leinonen, 2016). LA tools also have a series of data viewpoints like a social network, discourse analytics, content analytics, and student-centered analytics (Liu et al., 2017). The data sources used in LA tools usually come from a series of online learning systems like learning management systems (LMS), student admissions systems, student information, students' grades, and library services (Lockyer et al., 2013).

LA provides personalised feedback to students concerning their learning activities and results (Corrin & de Barba, 2015). The aim of LA as a digital online learning scheme is to make use of big data and analytics to develop learning outcomes by providing real-time and personalised feedback to students and their teachers with the sole aim of

increasing the productivity and efficiency of digital and online education (Lewkow et al., 2015). Furthermore, using LA in the feedback process gives a better understanding of the students' learning achievement (Lim et al., 2021). Pinheiro Cavalcanti et al. (2019) also opined that providing good feedback to students could enhance the capacity of students in self-regulating their academic performance.

Learning analytics has the potential to provide feedback to students regarding their performance and progress in their learning activities, thereby creating an opportunity for giving timely and accurate feedback for actualising and developing self-regulation skills in students (Schumacher & Ifenthaler, 2018). Learning analytics supports teaching staff in higher education in improving students' feedback process, which boosts students' metacognitive skills, and doing that also enhances teaching staff's instructional practice (Kollom et al., 2021).

In online learning, LA dashboards are the famous format for delivering such feedback to students. The dashboards are designed to visualise several sources of students' online data that are related to students' engagement and performances, and all put together in a single view (Corrin & de Barba, 2015). In the realm of LA and feedback, dashboards have obtained much awareness as technology tools that provide users with feedback containing appropriate insight, haste user reflection, and potentially provide interventions aimed at enhancing learning and the quality of student learning experience (Matcha et al., 2019).

Trends of Learning Analytics in Higher Education Institutions

Johnson et al. (2012) reported that LA was first mentioned in the New Media Consortium (NMC) Horizon Report of 2012 and has been regarded as one of the most significant trends in the area of technology-enhanced learning and teaching. Since then, LA has gained increasing relevance in online teaching and learning, particularly in HEI.

LA's main priority is data collection and analysis and the implementation of relevant interventions aimed at improving the students' learning experience (Greller et al., 2014). The existing data is collected and assessed, and the insights gained can be used to have a better understanding of students' behaviours and provide them with the required additional support (Gašević et al., 2015). The transmission of the resultant information to educators and students is an essential feature of LA. It allows them to improve their teaching and learning behaviours, stimulate the acquisition of knowledge and skills, and develop a better perspective of learning (Leitner et al., 2017).

In HEI, LA has proved to be of immense benefit to educational institutions in strategic areas such as allocation of resources, student success, and funding. To optimise strategic outcomes, the institutions are capturing so much data than before. Data is evaluated, and predictions are generated to acquire insights and take necessary actions based on essential questions (Bichsel, 2012).

From HEI's perspective, LA is a valuable tool for capturing students' learning performance and providing appropriate support from lecturers. Personalised or group support offers unique pedagogical approaches and a method to analyse learners' learning behaviour (Leitner et al., 2017). More academic institutions have been using LA approaches to acquire information on students' academic achievement, forecast future behaviours, and identify possible academic problems at early stages. Another reason for using LA in HEI is to strengthen inter-institutional interaction and establish a common agenda for students and lecturers (Atif et al., 2013).

The Attitude of University Teachers to Learning Analytics

According to Ferguson et al. (2016), it was reported that institutional adoption of LA is not as systematic as one might assume. Also, in a review of the usage of LA in higher education institutions conducted by Viberg et al. (2018), it was discovered that just about 6% of the 252 articles included in the study showed that LA is being widely adopted and used. Likewise, in a study by West et al. (2018), Malaysian and Australian academic staff were surveyed regarding their experiences and needs with using LA, focusing on their participation in LA projects. The study revealed that academics would instead use LA to improve their teaching than to enhance student retention. Tsai and Gasevic (2017) also pointed out that institutional acceptance of LA is limited because many HEIs are either in the planning stages of implementing LA or are piloting LA solutions that will be implemented by the entire institution later.

According to Persico & Pozzi (2015), the best practical use of LA by teachers in the classroom is still minimal. The teachers who utilise LA in an organised and instructionally informed way are a small group of early adopters. Also, Kaliisa et al. (2021), in their review of LA frameworks that address the notable challenges in LA adoption, reported that though researchers have made significant progress in designing suitable frameworks to conceptualise LA adoption among teachers. They have equally made substantial progress in integrating LA and learning theory, the adoption of LA by teachers has remained limited.

Likewise, in a mixed-method study of academic staff from higher education institutions from four European universities, Kollom et al (2021) revealed a relatively low perception and eagerness for academic staff to be required to act based on data that suggests students are at risk of failing or when they are under-performing. Cavalcanti et al. (2019) have earlier opined that giving effective feedback for supporting students' self-regulated learning is usually resource-demanding for university teachers.

Roles of Teachers' Attitude in Achieving the use of LA in Higher Education Institutions

The successful integration of educational technology tools in schools does not depend only on the quantity and complexity of such technologies or their mere existence in the schools but also depends greatly on the attitude and support of the teaching staff (Islahi & Nasrin, 2019). Therefore, the attitude of teachers towards using learning analytics plays a critical role in ensuring successful adoption of technology, effective incorporation and their use for productive performance in education. Furthermore, people's attitude to a particular technology is a vital component for adopting such technology (Islahi & Nasrin, 2019).

Attitude has been defined as the tendency to behave in specific ways due to the occurrence of certain affective, behavioural and cognitive components, and each of the components is inclined to influence the other two (Hernandez-Ramos et al., 2012). In addition, attitude towards conduct signifies an appraisal of an object or event that entails a series of quality dimensions such as good or bad, beneficial or harmful, and pleasant or unpleasant (Kundu et al., 2020).

Teachers' attitudes in terms of teaching with technology can be expressed as emotions, experiences and thoughts about the use of technology and the internet for teaching and learning (Tuncer, 2012). The attitude of people to their work has an influence on their efficiency and productivity (Kundu et al., 2020). An individual's attitude can be described as a factor that influences their behaviour in accordance with their thoughts and feelings. Attitude is also known as the degree of positive or negative effect in relation to a specific object or belief (Guillén-Gámez & Mayorga-Fernández, 2020). Therefore, teaching staff in higher education institutions are required to have good attitudes to using technology including LA for the purpose of achieving its optimal use in schools.

The attitude towards a planned behaviour such as the use of technology for teaching is also expressed as the extent to which an individual has a satisfactory or unsatisfactory assessment or appraisal about using technology for carrying out teaching and learning (Teo & van Schaik, 2012). Attitude is a multifaceted mental state comprising opinions and emotions which influence a person's enthusiasm, and it is structured by experience and have a dynamic effect on the response to all things and circumstances with which it is associated (Kundu et al., 2020).

Teachers' attitude to technology can be interpreted as a multi-dimensional construct that is made up of various components. Such components include anxiety or comfort, which the teacher experiences at the time of using technology and can be referred to as personal emotions (Schottenbauer et al., 2004). Also, teachers' attitude to technology is the personal motivation which teachers derive from the pleasure of using technology resources for teaching students, which can be termed as personal interest (Cai et al., 2017). Teaching staffs are critical to successful technology integration in the school system because they decide whether or not to use technology, and the choices to use technology in classrooms are usually influenced by teachers. Therefore, having the right attitude will play a significant role in the use of technology application such as LA in schools.

Since the emergence of using technology for teaching and learning, teachers' attitudes towards teaching with technology has been one of the primary constructs that determine teachers' intentions to use and the actual use of technology in classrooms (Scherer et al., 2018). Therefore, the decision to use LA in higher education institutions will be dependent on individual teachers' attitudes to them.

Teachers' attitude to teaching with technology are expected to play a significant role in attaining success in the successful adoption of technology in the classroom as well as effective integration and utilisation for positive output in teaching and learning (Islahi & Nasrin, 2019). Attitude towards using technology for teaching is considered an indispensable factor for detailed technology integration in teaching methodologies in schools (Hernandez-Ramos et al., 2012).

The success of any innovation in technology for supporting teaching in any educational course of study is subject to the support and attitudes of teachers that will implement the use of the specific technology (Teo et al., 2007). Sophisticated technologies that were designed for improving education can only achieve the aims for their design and implementation when teachers have the right attitude towards using them (Agyei & Voogt, 2011). According to research findings, technology attitudes are essential factors in how teachers prepare and incorporate the use of technology in the classroom (Admiraal et al., 2017).

Njiku et al. (2019) had expressed that beyond infrastructures and tools availability in schools, the successful use of any form of technology in education is dependent on a number of factors which include having the right attitude by teachers who are involved in technology adoption in schools. Attitude is one of the most critical factors for the successful use of technology in education at all levels, and of which LA is not an exception.

The decision to use technology depends on individuals' attitudes to them, and as a result, teachers' attitudes cannot be ignored while incorporating technology into teaching (Hernandez-Ramos et al., 2012). Teachers' attitude is an indispensable factor for successfully integrating technology in both training and in-service learning situations. So, teachers' attitudes towards technology integration are considered a vital factor for successful technology integration in teaching and learning (Hernández-Ramos et al., 2014). Attitude also plays a critical role in making technology acceptance decisions by users, including university teachers. Therefore, it is imperative to entrench the development and cultivation of positive attitude needed to achieve a successful technology application in schools.

Extant research suggests that attitudes toward the use of technology and its educational relevance are essential elements of classrooms' technology acceptance and integration (Guillén-Gámez & Mayorga-Fernández, 2020). Therefore, teachers' attitudes cannot be ignored while incorporating technology like LA to online teaching and learning in higher education institutions.

Positive Teachers' Attitude and Negative Teachers' Attitude

Farjon et al. (2019) proposed that teachers' attitudes towards technology can be positive or negative, affecting how teachers respond to using technologies in the classroom with their students. Teachers' attitudes toward using technology for teaching and learning are influenced by their positive or negative attitudes. Teaching staff that have positive attitudes regarding technology are seen as having a better chance of developing their technology skills. The more positive teachers' attitude toward technology is, the better equipped they are in using technology for teaching.

Positive attitudes towards the use of technology for teaching also promotes the incorporation of technology into teaching and learning (Teo & Noyes, 2011). Therefore, one of the foremost steps required for the integration of technology into teaching and learning is to promote among teachers, positive attitude towards using relevant technology as tools for improving teaching and learning (Hernández-Ramos et al., 2014). Thus, for LA to be successful in higher education institutions, lecturers are required to have positive attitudes towards the use of technology.

Positive teachers' attitudes will be required for successful usage of LA in schools, and such positive attitudes will influence teachers' practice, which in turn influences students' performance. Kundu et al. (2020) opined that positive teachers' attitudes promote better classroom performance and teaching practice. Positive teachers' attitudes have also been acknowledged to be a vital contributive factor in the successful technology integration in the classroom (Chigona, 2015). Teachers with positive attitudes have been reported to be better at using technology effectively in their classrooms (Alshammari et al., 2016; Prior et al., 2016). As a result, lecturers are encouraged to cultivate a positive technology attitude as a starting point for the effective use of LA.

Tuncer (2012) discoursed that access to technology promotes positive attitudes towards using technology. Teachers with more access to relevant technology usually have a more positive technology attitude. A positive attitude towards technology is related to the amount of time spent using it. Likewise, the quantity of technology used for teaching is also linked to a positive attitude toward technology (Farjon et al., 2019). Therefore, a positive attitude to the use of LA in higher education institutions will be improved if the required and necessary access to relevant LA tools is provided for lecturers.

A negative attitude towards technology has also been reported to be a significant factor behind the resistance of teachers in infusing technologies into education despite the facilities available in schools and classrooms. The negative attitudes usually cause teachers to doubt the usefulness of technology in teaching and, therefore, averse to using technology in the teaching process (Islahi & Nasrin, 2019). Many promising technological innovations failed to attain their usefulness in the past due to poor end-users attitudes (Islahi & Nasrin, 2019). An attitudinal shift on the part of teachers is needed because they need to feel the urge to use data to support teaching and feedback (Ebbeler et al., 2017). If teachers express a lack of confidence or have a negative attitude in using technology, their technology adoption would be less than ideal (Guillén-Gámez & Mayorga-Fernández, 2020).

Lack of confidence and negative attitude from lecturers may mar the successful use of LA in schools. Consequently, successful implementation of LA in higher education institutions requires that lecturers maintain positive attitude towards LA for supporting their online teaching and providing feedback to students.

Technology Competence, Experience and Teachers' Attitudes

It has been reported that there is a significant relationship between teachers' attitude towards technology and their technology competence for teaching and learning (Yerdelen-Damar et al., 2017). Teachers' competence in teaching with technology was found to be significant and positively related to their attitudes in teaching with technology (Inan & Lowther, 2009). Karaca et al. (2013) also conducted a study on teachers' competency in using technology for teaching, and their attitudes and a direct positive relationship was established. Tuncer (2012) also found that competency in using technology is significantly related to teachers' attitudes. Attitude has significant effects on increasing teachers' competencies and bringing about effective integration of all types of background competencies needed in the classroom (Hernández-Ramos et al., 2014). It is also expected that lecturers' competence in using LA will be improved when they have positive attitudes.

Guillén-Gámez & Mayorga-Fernández (2020) opined that teaching experience has a considerable influence on teachers' attitudes toward using technologies. Teachers with more technology experience have a more positive attitude toward using technology in the classroom and learning environment (Metin et al., 2012). Cavas et al. (2009) also reported in their study of the experience of science teachers' attitudes to using technology for instruction that teachers who had more than five years' experience in using technology were significantly different and better in terms of technology attitudes compared to teachers with lesser years of experience. Also, it is anticipated that as lecturers' experience about LA increases, their attitudes to the use of LA will be improved.

Conclusion

This paper explored the role of teachers' attitudes in achieving integration of LA in higher education institutions. The importance of university teachers' attitudes in ensuring technology integration in higher education institutions cannot be overemphasised. To promote the optimal use of available LA' tools in schools, lecturers need to exhibit positive attitudes toward using LA for supporting teaching and giving feedback to students. On the other hand, negative attitudes will make lecturers not appreciate the importance of using technology. Thus, the aim of promoting the use of technology tools like LA in schools will be defeated.

Therefore, there is a need to improve the attitude of lecturers to the use of LA in HEI, particularly in using LA solutions to provide effective feedback to students. The attitude can be improved through training, access, and awareness of the advantages of using LA in giving feedback to students. Also, there is a need to conduct more empirical research on the attitude of lecturers to LA in HEI institutions due to limited empirical research on it. These will enhance the required competencies and experiences in using LA to support teaching and the provision of data-driven feedback.

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