Assessing the effectiveness of predictive, Analytics and adaptive learning Tools

Chong Lor

University of Wisconsin – Stout

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Abstract

This paper aimed at assessing the trends in predictive learning, with special focus on technology-mediated predictive, analytics and adapting learning. Technology-mediated learning is well placed to foster the capacity of instructors to predict student performance, provide appropriate intervention when a student is struggling, and even customize the learning process to meet the learning needs of every student. It is noted that milestones have been realized in current technology-mediated predictive learning, as exemplified by Connect Insight and Desire2Learn initiatives. These predictive learning tools consider essential aspects of a desirable learning environment. In the future, new state-of-the-art tools and software are expected to be produced. Many institutions are expected to adopt these, imply that these technological developments would revolutionize education, in which an increasing number of students would benefit. However, a close examination of these trending developments reveals limited inclusivity, much less for the cases of learners with disabilities. It is necessary that technology-mediated predictive learning to consider the needs of learners with disabilities. Teachers and curriculum would need to be adjusted to meet the needs of users. Change management also needs to be strategic to ensure that objectives are realized.

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Introduction

Innovations in the educational sectors have sprung, prompting educators to learn on how to utilize the new technologies. This is exemplified by the emergence of new education and learning terminologies such as “distance learning”, “open education”, and “Virtual learning”, not to forget “technology-mediated predictive learning”, which is now a pivotal part of the day-to-day educator’s focus. Adoption and implementation of technology-mediated learning is crucial for the education system is imperative in many ways, as documented by Biddara and Dias (2004). For instance, technology-mediated learning is a delivery vehicle that is ideal for education and learning. Secondly, education systems and institutions should adopt technology-mediated learning because it is rich of information. Students can access information at any time, regardless of place. Thirdly, technology-mediated learning is a way forward to imparting knowledge to marginalized groups, that is, students with physical disabilities who have to overcome distance barriers and communication barriers to access education. Technology-mediated learning is desirable because it entails blended learning. This is because technology-mediated learning has the potential of augmenting traditional offerings in classrooms. In doing so, it frees the valuable resources and expands the capacity to greater numbers of students in post secondary institutions. Even much noteworthy, technology-mediated learning is also well placed to foster the capacity of instructors to predict student performance, provide appropriate intervention when a student is struggling, and even customize the learning process to meet the learning needs of every student. This paper assesses the current state of predictive, analytics and

adaptive learning with respect to this view and in comparison with a traditional form of predictive learning.

Problem Statement

As earlier stated, technology-mediated learning is well placed to foster the capacity of instructors to predict student performance, provide appropriate intervention when a student is struggling, and even customize the learning process to meet the learning needs of every student. However, limited considerations have been accorded to technology-mediated learning with respect to predicting student performance, intervening when a student is struggling, and personalizing the learning process for every student. Thus, this creates an allowance for a number of critical questions to thrive. For instance, what is the state of predictive, analytic, and adaptive learning? What could be lacking.

Status of Predictive Learning Technology

Various noticeable developments have taken place regarding the use of technology-mediated learning with respect to predicting student performance, intervening when a student is struggling, and personalizing the learning process for every student. These developments are particularly exemplified by Connect Insight and D2L initiatives.

Connect Insight has developed predictive learning software known as Connect Success Academy. Upon logging in the Connect Insight enabled course, the use is presented with a banner that comprises an Insight link. In the subsequent log in procedures, users can access Connect Insight via the performance drop-down

menu. The software displays student distribution, providing an overview of sectional performance, in which students in every quadrant are represented in terms of the sizes of circles, as well as in terms of numbers.

The position of the student is essentially based on the current score averages for submitted and graded assignments, as well as the number of hours that have been spent in Connect on assignments. This also includes the time that has been spent on reading e-books, which is recorded at sectional levels. The information is presented graphically. The graphical information is accompanied by the numbers of active students, expressed relative to the total number of attending students. Active student group comprises those that have submitted at least one assignment. The student distribution is often displayed by default, with students represented with opaque circles. The user can tap the circles to visualize student cards. The graph areas can be zoomed and swiped to see other areas. The distribution function of students possesses functionalities comparable to those of other graphs, only that it makes use of opaque squares in representation of assignments.

The student cards can be accessed by clicking student distribution circles. The student card reflects the current score of individual students, the time spent and the number of submitted assignments, in addition to the total lead time. Lead time refers the amount of time that the student started tackling an assignment before the actual course start date. In the cases where the number of students with similar score is large, the predictive software makes the circles to appear darker, reflecting the cluster of students. The user can tap the cluster to view the model comprising the list of students. The assignment cards can be accessed by clicking the

assignment distribution squares. The assignment cards will show the average scores of sections, the time spent and the number of admitted students, as well as the lead-time. Users can quickly view the student plot resulting from assignment submissions.

However, this software is limited in the sense that it does include the time, as well as performance in assessments that have been done offline such as speech and writing assignments. Such may only be presented as no time was spent in doing them.

Desire2Learn (D2L) has also advanced technology-mediated predictive learning. In D2L, the process of management of large courses comprising of many sections has been made easy. D2L provides support to multiple section management, creating an allowance for the instructors to offer varying due dates, as well as differing content and assessment criteria to the advantage of the learners. This tool also enables every instructor to tell when the learners need time extension and windows to complete their assessments. Thus D2L ensures that the instructors and learners do have a difficult time in creating additional forms of assignment to accommodate the student needs by supporting an array of flexible education delivery models. The tool is designed in anticipation of varying learner needs, including allowance for accommodation of the enrollment dates, performance, and learning paths that are dependent on time. This model is inclusive for all the learners.

The tool also comes with assessment and measurement features, which assure full functionality, including document and data security. Users can preview

their submissions, at the same time gauge the scores based on rubric while offline and online. This is supported by sophisticated media platform that makes it possible to randomize questions. D2L learning allows users to share questions with others. Users can copy and save questions to use as a template. Learning assessments comprises of the summative, anecdotal and formative information that can be collected when online or offline. The learning environment in D2L creates the allowance to incorporate custom grades, including tracking information crucial to the processes of assessments. Users can order and reorder items for easy access and use. “Most large corporations such as Pearson, Blackboard and Desire2Learn have invested heavily in analytics to capture a significant amount of data, including the time spent on a resource, frequency of posting, number of logins, etc.”, according to Li.

This software also supports social and collaborative learning. When learners are assessing discussion or reading, optimal format view is crucial. The tool appraises this point by providing connection to conversation even when users are not on the computer. Users can receive notification through their mobile phone, as well as through personal emails. D2L comprises of a calendar, which is a crucial tool for organization. This allows users to select their colors and calendar format. They can set due dates on calendar and receive notifications when deadlines are critical. D2L allows users to manage and enter personal task lists. Instructors and learners can bridge internal and external learning networks through integration of profiles with social medial platforms such as Facebook and twitter.

Communication is also enhanced, and users can view other online users and even send private messages. The feature allows users to control the amount of emails to receive, and enhances the capacity of users to communicate with their peers with relative ease. Learners receive purposeful notification on what they need to pay keen attention, informing them of their assessments' feedbacks. The important information of course activities cannot be filtered, and users can receive critical course information, including questions, discussions, and assignment updates.

Even important, D2L is designed to support predictive learning. The tool does much more role other than serving as a location for storage and access of assignments. It is integrated with D2L e-portfolio. This reflects the journey of learning, creating an enabling environment for the predict student performance and warrant remedial support. Furthermore, D2L is integrated with D2L learning repository. This further allows instructor to use learning resources within the learning repository and even embed them on learning environment platform in the form of news, discussions, and questions. The tool allows resourced to be created locally, as well as be drawn from an aggregate of materials and libraries available through search interfaces. "Greenville College was able to demonstrate the advantages of the Student Success System to faculty and begin developing a best practices protocol for using and engaging with the learning environment," (Rhounda, 2014)

Clearly, technological developments are positive and consider essential aspects of learning environment highlighted earlier. Thus, they are also better than

the traditional forms of predictive learning. Indeed, traditional forms of predictive learning, such as IQ, have been limited because it has negative implications. In one way, children with low IQ scores are likely to develop a feeling of rejection. This feeling could have far reaching consequences in their lives' successes, including education. IQ could make "one a victim of self fulfilling prophecy" (Kirst & Zastrow, 2010). Children with relatively low IQ are likely to lose motivation on learning that they may not be as bright as others. They would feel discouraged from working hard while they would be filled with feelings of inferiority complex. However, the point to inform children of their IQ could only be advantageous to children who turn out to score relatively high. Such children are likely to possess high self-esteem on learning that they are better than others are. Nevertheless, letting children learn of their IQ only cultivates differences among them. Children could be bullied and even be sidelined based on their IQ levels.

In the same way, letting parents know of their children IQs comes with certain inherent implications, as well. However, the negative implication is that few parents are likely to act in the most desirable way, based on the information obtained from the IQ. Some IQ results, especially the low IQ scores, would disillusion some parents from the full dedication to assist children to excel. Others are likely to give ill-informed guidance to their children, giving them a reason to terminate education (Kirst & Zastrow, 2010). IQ could be misunderstood and be applied in the grading children, which constrains constrained their objectivity. This makes the current technology-mediated predictive, analytic and assessment learning advantageous.

These predictive assessment materials assure quality measurement, which is subject to compilation of resources aimed at assisting higher education facilities to assess support and academic programs and their effectiveness. The tool presents for categories of resources. The first category comprises of elements such as questionnaires, surveys, data collection, and examinations. These are considered to be of particular interest for instructors searching for resources to assess learning outcomes of jobs. Other resource categories include initiatives, benchmarking systems, data resources, projects, and platforms.

Future of Predictive Learning Technology

The future of technology-mediated predictive, analytics and adaptive learning promises desirable learning results. Predictive learning-mediate technologies are also expected to address a number of areas of desirable learning environment. For instance, one of the crucial elements is that a desirable curriculum should have assessment tests for learners. The tests need to be conducted frequently, and are aimed at assessing the progress of students and understand their learning needs to recommend action for improvement. Learners need to be subjected to continuous assessment tests on certain topics (Bruner 2009) Curriculum should have continuous assessment tests, yet the desirable test approach should acknowledge the imperativeness of the imagination processes. There are various reasons as to why imagination is crucial. Imagination enables the learners to visualize possibilities that exist in a given actuality. Imagination can be perceived as the process whereby once perceives what is unconventional. In other

cases, imagination has also often been associated with creativity. In order to realize its objectives, the assessment tests should be designed to be as objective as possible (Egan 2010). Technology mediated predictive, analytics and adaptive learning would bridge gap. Technology mediated predictive learning would encourage creative and critical thinking such as through imagination(Fellini, Federico, Peter Bondanella, and Manuela Gieri 2009).

Technology-mediated predictive learning would develop learners by preparing them to fit into the society. The development encompasses the transformation of structures; the input from the human that interact with the learner is subject to nature of content structure. The structure, which could be non-contingent and consequential, interests should interest more than the content itself. More often than not, learning process entails taking in of contents that are more or less inconsequential or contingent, Self-initiated learning is composed of cultural input, although it is not easily discerned following its pervasiveness and, hence, the liability to be taken for granted. The interaction of learners in the technology-mediated predictive, analytics and adaptive learning facilitates their learning in life and the world phenomena from the people that they interact in a manner that enhances processes of conceptualizing ideas (Tasos 2010).

In all these respects, only predictive learning would be placed to guide the instructors in assuring desirable student outcomes because it enables them understand learners' weaknesses and adopt appropriate remedial strategies. Furthermore, new state-of-the-art tools and software are expected to be produced. Many institutions are expected to adopt these, imply that these technological

developments would revolutionize education, in which an increasing number of students would benefit (Kirst-Ashman and Zastrow, 2010; Doerr and Zangor, 2013).

Weaknesses and Recommendations

Kirst-Ashman and Zastrow (2010) observe that technology has revolutionized education and learning processes in many ways, yet the subject is still characterized by persistent advocacies on the need for institutions to continue adopting technologies, seizing the opportunities in emerging technologies to improve the learning needs.

Examinations of predictive learning tools have overlooked the needs of the learners with disabilities. Indeed, Mason (2001) advises that teachers be allow to participate in implementing technology-mediated predictive learning processes for students with disabilities, rather than adopting it as an imposition. There can be no successful approach such as involving teachers in the implementation and designing of the phases. This is because such an approach would enhance the effectiveness of predictive learning.

According to Mason (2001), for digital-mediated predictive learning among students with disabilities to thrive, robust technical infrastructures should be put in place to give support to the technical processes that are vital for the course material production, digital-mediated predictive learning course delivery and teacher-student supports. According to Schofield (1997), the implementation process of digital-mediated, predictive learning calls upon an effective, strategic planning. Thus, changing the process of offering education to students with disabilities

through technology requires the implementation of strategies and plans in an effective manner. For instance, proficient planning for the digital-mediated predictive learning course calls for attention to develop the course content, which includes sound pedagogical aspects that are necessary for the delivery of technology-mediated predictive learning. According to Biddara and Dia (2003), the focus on various sub-strategies is also essential in ensuring smooth integration of digital-mediated predictive learning across education institutions for students with disabilities. Schofield (1997) observes that planning is one of the complex processes, and which should be specific to certain educational institutions for students with disabilities.

Another limitation about the trending predictive technology-mediated predictive learning is the lack of capacity for teachers and curriculum to keep abreast the trending developments. Jamlan (2002) suggests that there is the need for a slow pace while adopting technology-mediated predictive learning. The transition process from traditional approaches to the digital stage should consider the needs of all educational institutions. Notably, educational institutions differ in terms of size and modes of operation. Therefore, such aspects as digital device affordability ought to be considered, while embracing digital education in society. Furthermore, such a move to enhance digital-mediated predictive learning calls for cooperation from concerned parties like the management, parents, teaching staff, and learners (Groth, 2011).

Even so, other perspectives regarding technology-mediated predictive learning among the leaner with disabilities exist. According to Doerr and Zangor

(2013), there are reasons as to why technology-mediated predictive learning processes for the loaners with disabilities should be adopted, in particular, because they have a positive impact on educational achievement among the learners with disabilities students. By support and professional capacity enhancement, these programs give assistance to teachers in matters pertaining to best teaching practices. In addition, the qualities of grass root processes are pivotal in diffusing these innovations while making classrooms authentic centers of learning. Such processes serve as an encouragement to teachers to shift from the strict traditional information delivery approach and adapt to the needs of learners. The technology-mediated predictive learning implementation increases access to education, as well as train students with technological integration; the learners with disabilities learners inclusive. This is advantageous, especially to innovative institutions, where technology-mediated predictive learning constitutes an integral part by which technology is often integrated in the processes of learning.

Conclusion

This paper has sought to evaluate the trends in predictive learning, with special focus on technology-mediated predictive learning. This is in appraisal of the fact that technology-mediated learning is also well placed to foster the capacity of instructors to predict student performance, provide appropriate intervention when a student is struggling, and even customize the learning process to meet the learning needs of every student. A number of elements of desirable elements of curriculum are highlighted, justifying the essence of technology-mediated predictive learning,

as well as highlighting the essential elements that technology-mediated predictive learning should pay keen attention. It is noted that milestones have been realized in current technology-mediated predictive learning, as exemplified by Connect Insight and Desire2Learn initiatives. These predictive learning tools consider essential aspects of a desirable learning environment. In the future, new state-of-the-art tools and software are expected to be produced. Many institutions are expected to adopt these, imply that these technological developments would revolutionize education, in which an increasing number of students would benefit. However, a close examination of these trending developments reveals limited inclusivity, much less for the cases of learners with disabilities. This point is support by array of literature. Therefore, it is necessary that technology-mediated predictive learning to consider the needs of learners with disabilities. Teachers and curriculum would need to be adjusted to meet the needs of users. Instructors would need to adopt and utilize these new tools. Change management also needs to be strategic to ensure that objectives are realized.

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