A conceptual framework for identifying emotional factors leading to student disengagement in Virtual Learning Environments

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ABSTRACT

Would instructors in Virtual Learning Environments (VLEs) benefit from being able to monitor the mental well-being of students? We are witnessing a mental health crisis in higher education without precedents. Recent statistics by the institute for Public Policy Research showed that 15,000 first year students in UK Universities reported a mental health issue in 2015/2016, a staggering fivefold increase from a decade ago, with 94% of HE institutions reporting an increase in mental health services requests. Studies on Affective computing (AC) suggest that being aware of the students' positive or negative emotions may help tutors identify issues related to student's engagement and identify students who need additional assistance during their study. But how can this be implemented in a way that is not disruptive to education? We have devised a conceptual framework in which the role of the online tutor or facilitator is incorporated into an environment that coordinates together information coming from the various communicative acts happening during learning, from tasks in the classrooms, to question to the teachers to discussion among peers. The communicative acts are all "observed" through the lens of the "emotional loaded" prediction system, which can decide to intervene, or simply flag, when some communication needs to be looked at more carefully. The conceptual framework is evaluated by a series of experiments and case studies, aimed at assessing the feasibility and appreciate the usefulness of single potential components, and on the basis of expert commentaries.

KEYWORDS

Student Mental Health, Affective computing (AC); Emotion Analysis; Engagement; On-line learning

1 Significance and Relevance of the Topic

We are witnessing a mental health crisis in higher education without precedents. Recent statistics by the institute for Public Policy Research showed that 15,000 first year students in UK Universities reported a mental health issue in 2015/2016, a staggering fivefold increase from a decade ago, with 94% of HE institutions reporting an increase in mental health services requests [1]. Previous research addressed the issue of monitoring students with the purpose of helping them achieve a better learning experience. Typically, such research makes use of various learning analytics, students' educational history and demographic information in order to predict their performance, for instance [2] used machine learning algorithms on specific analytics. However, few studies have paid sufficient attention to the use of emotion and/or sentiment analysis in addition to the student's educational history for a better understanding and prediction of student engagement in advance. To partially address this problem, we conducted studies to understand if emotional factors could be identified from the analysis of online conversations in a Virtual Learning Environment, using data from Stanford MOOCs dataset [3]. Our analysis shows how the students' emotions disengagement changes in real time using different input features collected from a wide range of communications during learning in the VLE. This suggests that the development of a real-time "observer", that would work as a monitor of emotions, could have a significant impact on the students' disengagement, by also providing complementary explanations of the of student engagement in future.

2 Content

The poster is meant to challenge the audience on the appropriateness/feasibility of a conceptual framework for a learning model where educators can receive real time warnings in order to identify whether a student is manifesting distress, or emotional engagement, over time, on the basis of the student's behaviour within the online learning environment. The poster will depict such conceptual framework, with the different theoretical "components", and will introduce the methodological evaluation of such components, by identifying problem, technical/algorithmic solution, use of off-the-shelf packages on available dataset to demonstrate feasibility and usefulness. It will then pose a number of provocative questions around what "can" be done, on the basis of our studies and experiments, and stimulate a discussion on the challenges of implementing such a system and how this can impact online teaching and learning.

REFERENCES

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