

Measuring Motivation in Learning Management System (Poster)

Miri Barhak-Rabinowitz

Technion – Israel Institute of Technology
miri.barhak@gmail.com

Yael Erez

Technion – Israel Institute of Technology
yael.erez@gmail.com

Ido Roll

Technion – Israel Institute of Technology
roll@technion.ac.il

מדידת מוטיבציה ללמידה בסביבה דיגיטלית (פוסטר)

יעל ארז

הטכניון – מכון טכנולוגי לישראל
yael.erez@gmail.com

מירי ברחק-רבינוביץ

הטכניון – מכון טכנולוגי לישראל
miri.barhak@gmail.com

עזו רול

הטכניון – מכון טכנולוגי לישראל
roll@technion.ac.il

Abstract

Usually, motivation for learning is measured using self-report surveys (Fulmer & Frijters, 2009). However, trace-data from Learning Management System (LMS) enable a new view into the learning process, thereby creating fertile ground for measuring learner motivation. Chen and Jang (2010) discovered that there were no significant correlations between learning motivation and the frequency with which learners logged into the LMS or the number of clicks performed on the platform. Therefore, to derive meaningful indicators of motivation within LMS, measurements should be based on the key question: *"What tasks or situations should elicit explicit behaviors?"* (Mislevy et al., 2006). Aluja-Banet and colleagues (2019) applied such approach to evaluate motivation using trace-data in LMS. Here we evaluate measurement of motivation in the Moodle LMS. Aluja-Banet and colleagues (2019) define motivation as "a psychological feature that arouses a student to invest its resources to start and to persist in an action of notable intensity toward desired goal, despite of distractions and the press of other priorities." (p.2). We adopted this definition and adjusted their behavioral indicators to fit the Moodle data. We derived 3 behavioral indicators for motivation in the LMS data: *Agility*, measuring how fast a student starts the task after its recognition (high pace -> high motivation). *Persistence*, the extent to which an individual performs a prolonged and concentrated

*Proceedings of the 16th Chais Conference for the Study of Innovation and Learning Technologies:
Learning in the Digital Era*

I. Blau, A. Caspi, Y. Eshet-Alkalai, N. Geri, Y. Kalman, T. Lauterman (Eds.), Ra'anana, Israel: The Open University of Israel

effort in order to pursue a goal. To measure persistence, we transformed the data from sporadic logs into consecutive learning "chunks". *Delivery*, computed as the ratio of the fulfilled obligatory tasks in respect to the pending ones in a given subject, as a proxy to the intensity of the effort done to achieve the goal. Students who enrolled in an online course at the Technion University participated in the study (N=31). Factor analysis yield a unidimensional measurement for motivation, replicating Aluja-Banet et al., (2019) findings. Total score on self-report questionnaires for motivation didn't correlate with our measure. This might be expected as concerns have been raised regarding the alignment of noncognitive factors measured with log-files data and self-reports (Jovanović, et al, 2019; Zhou & Winne, 2012). Overall, this research demonstrates progress towards developing a new methodology to measure motivation.

Keywords: Motivation, Learning Analytics, trace- data, LMS, Assessment.

References

- Aluja-Banet, T., Sancho, M. R., & Vukic, I. (2019). Measuring motivation from the virtual learning environment in secondary education. *Journal of Computational Science*, 36, 100629.
- Chen, K. C., & Jang, S. J. (2010). Motivation in online learning: Testing a model of self-determination theory. *Computers in Human Behavior*, 26(4), 741–752.
- Fulmer, S. M., & Frijters, J. C. (2009). A review of self-report and alternative approaches in the measurement of student motivation. *Educational Psychology Review*, 21(3), 219-246.
- Jovanović, J., Gašević, D., Pardo, A., Dawson, S., & Whitelock-Wainwright, A. (2019, March). Introducing meaning to clicks: Towards traced-measures of self-efficacy and cognitive load. In *Proceedings of the 9th International Conference on Learning Analytics & Knowledge* (pp. 511–520).
- Mislevy, R. J., Steinberg, L. S., Almond, R. G., & Lukas, J. F. (2006). Concepts, terminology, and basic models of evidence-centered design. In D. M. Williamson, R. J. Mislevy, & I. I. Bejar (Eds.). *Automated Scoring of Complex Tasks in Computer* (p. 15–47). Routledge. <https://doi.org/10.4324/9780415963572>
- Zhou, M., & Winne, P. H. (2012). Modeling academic achievement by self-reported versus traced goal orientation. *Learning and Instruction*, 22(6), 413–419