

# **A micro-learning based model to enhance student teachers' motivation and engagement in blended learning**

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## **Abstract**

Blended learning, the combination of face to face and online learning, is increasingly adopted by educational institutions worldwide in initial teachers' education or teachers' continuing professional development programs. Blended learning can have many potential benefits. However, the intensity of student participation in on-line activities varies. Therefore, it still remains a challenge to stimulate students' motivation and active engagement in blended learning. The current study uses the Self-Determination Theory (SDT) of motivation as its theoretical framework and proposes a micro-learning based blended learning model to support pre-service and in-service teachers' education. The proposed model aims to enhance student teachers motivation and engagement in blended learning by supporting content-learner, teacher-learner and learner-learner on-line interactions through micro-learning. Educators, designers and policy makers could consider the proposed model in order to design and implement blended learning in order to further enhance and sustain learning motivation and engagement.

## **Keywords**

Blended learning, motivation, engagement, self-determination theory, micro-learning, teachers competencies, autonomy, competence, relatedness, learner interactions

## **1. Introduction**

The range and complexity of competences required for teaching in the 21st century are constantly evolving. Research suggests that contemporary teacher professional development programs should focus on pedagogy of teacher education, research and reflection, professional identity, and different kinds of knowledge (Ping, Schellings, & Beijgaard, 2018). Blended learning is an instructional approach that intends to offer enhanced pedagogy, increased learning effectiveness and satisfaction, increased access and flexibility and improved cost effectiveness (Graham, Allen, & Ure, 2005). Blended learning is increasingly utilized by educational institutions worldwide to facilitate pre-service and in-service teacher education. However, access to on-line and blended learning teacher professional development does not always ensure improved learning experiences and outcomes (Ross, 2011). Student participation in different on-line learning activities varies in intensity and quality. The literature often reports low student engagement in online activities due to low motivation levels (Jordan, 2014; Hartnett, George & Dron, 2011; Muilenburg & Berge, 2005). Moreover, research suggests that students' preferences and motivation to use different on-line learning activities in the context

of blended learning, regardless their abilities and styles, has not been investigated sufficiently (Baragash, & Al-Samarraie, 2018). Promoting student learning motivation and engagement in blended learning still remains a critical issue.

The current study proposes a model that aims to promote student motivation and engagement in the on-line component of a blended learning approach based on micro-learning.

## **2. Background**

### *2.1 Self-Determination theory of motivation*

Self-Determination Theory (SDT) (Ryan & Deci, 2000) is a well-established and empirically supported theory of motivation. It distinguishes two types of motivation: intrinsic and extrinsic motivation. Intrinsic motivation refers to doing something for its own sake and extrinsic motivation refers to doing something for a consequence external to the activity itself. With the process of internalization, the two types of extrinsic motivation, namely identified regulation and integrated regulation, can be transformed from extrinsic types into personally endorsed values. Supporting the self-determined types of motivation (intrinsic motivation and identified regulation) leads to satisfaction and enhanced performance. According to the theory, a basic set of psychological needs must be satisfied in order to enhance intrinsic motivation. These needs are autonomy, competence and relatedness. Competence refers to the desire to feel effective in attaining valued outcomes. Autonomy refers to the desire to self-initiate and self-regulate own behaviour. Relatedness refers to the desire to feel connected to others (Ryan & Deci, 2000b). If the basic psychological needs of autonomy, competence and relatedness are supported, students are more likely to internalize their motivation to learn and to be more autonomously engaged in their studies (Niemi & Ryan, 2009). Self-determination theory has been successfully applied in on-line learning environments (Nikou & Economides, 2017; Hartnett, 2016; Chen & Jang 2010) and online distance-learning of preservice teachers as well (Hartnett, George, & Dron, 2011).

### *2.2 Motivation and engagement in blended learning*

Blended learning is a pedagogical approach that combines online and face-to-face instructional activities (Graham, 2005). Based on a widely adopted classification (Moore, 1989), there are three types of interactions in a distance learning environment: learner-content, learner-instructor and learner-learner. Blended learning not only offers technology-mediated educational content and resources delivery (learner-content interaction), but also offers technology-supported communication and collaboration among the learning community (learner-instructor and learner-learner interactions). There are many benefits associated with the use of blended learning: increased learning effectiveness, optimized learning experience, increased access and flexibility and improved cost effectiveness (Graham, Allen, & Ure, 2005; Graham, 2013). However, research has shown that motivation to learn in online learning contexts is a complex, multidimensional and situation-dependent construct (Hartnett, 2016). Studies exist providing evidence for low levels of student motivation and engagement in online activities (Jordan, 2014; Hartnett, George & Dron, 2011; Muilenburg & Berge, 2005). Developing appropriate instructional methods to support motivation and engagement in blended learning contexts is an important research issue. Latest research highlights the

importance of designing blended learning activities that support learners' interactions (Powell, & Bodur, 2019).

### 2.3 Micro-learning

Micro - learning is a learning approach that is based on the delivery of small learning units and short-term focused activities (Hug, Lindner, & Bruck, 2006). Micro-learning resources can be made available on-demand to facilitate just-in-time learning. Micro-learning seems to be a promising learning delivery method that enhances the learning experience and outcomes. It has been successfully used in professional and corporate working environments (Werkle, Schmidt, Dikke, & Schwantzer, 2015; Pimmer, & Pachler, 2014) and Massive Open Online Courses (MOOCs) as well (Deng, Shao, Tang, & Qin, 2014). Main MOOCs providers already offer courses based on the principles of micro-learning. The micro-learning approach is in-line with the lifelong learning and the micro-credentials approach of professional development. Micro-credentials are based on the competency-based learning model. Competency-based teaching and learning differs from other forms of more abstract learning in that learners receive small units of instructions corresponding to specific skills or competencies. These small learning units can also be adapted to learners ability levels so as learners follow their own personalized learning paths. The application of micro-learning in teacher education and continuous professional development is rather new. Very few studies exist that are based on the micro-learning approach. A proposed design of an adaptive micro-learning implementation embedded in MOOCs (Sun, Cui, Yong, Shen, & Chen, 2015), a micro-learning based blended learning approach to enhance student engagement (Semington et al., 2015) and a pilot implementation of the micro-credentials mode in the field of teachers' professional development (Friedler, 2018) are such examples. To the best of our knowledge, no study exists on the development of a blended learning approach based on the micro-learning concepts for pre-service and in-service teachers' education.

### 3. The proposed model

Our blended learning approach based on micro-learning is aiming at supporting and enhancing the three forms of learning interactions (Moore, 1989): learner-content, learner-instructor and learner-learner.

Micro-learning facilitates the learner-content interaction. The on-line delivery of micro-content that is focused on a specific skill or competency (e.g. subject knowledge or how to teach specific subjects) facilitates the learner-content interaction by allowing the learner to learn without information overload. It is also consistent with the attention span constraints of the human brain. It may also provide just-in-time knowledge that learners need or are interested to know, offering an authentic learning experience. Moreover, when micro-content is adapted to learners' ability, preferences or context, on-line learning experience becomes personalized. The learner – content interaction can also be supported by micro-learning self-assessment tasks.

Micro-learning facilitates the learner-instructor interaction. One form of micro-content delivery can be formative micro-assessments with different question types that are followed by the provision of automated or tutor-generated feedback. Feedback can be just-in-time and context-specific. Moreover, feedback can not only be cognitive but also affective as well, further supporting the communication links between learner and instructor. Also, survey polls

that collect student feedback are usually a form of bite-sized information that can be shared between learners and instructor.

Micro-learning facilitates the learner-learner interaction. Different forms of micro-content can be exchanged between learners in a formative or informative way. Examples are cooperative or collaborative content creation activities based on the principles of micro-learning (small learning units with short completion times), review for contents generated by other learners, exchange of bite-sized teaching or learning materials (e.g. web links, videos, text, images) through social media, micro-blogging, or sharing learning or job-relating experiences through forums.

Research has shown that micro-learning has the potential to enhance learners' basic psychological needs of autonomy, competence and relatedness and stimulate their motivation and engagement (Nikou & Economides, 2018). The facilitation of learner-content and learner-instructor interactions can enhance learners' perceived autonomy levels. The proposed micro-learning based blended learning approach can be autonomy supportive since it provides students with self-contained small, manageable learning units and tasks that can also be personalized and adapted to learners' needs and preferences. It can also be competence supportive because just-in-time cognitive or emotional feedback enhances students' perceived sense of competence and gives learners more control of their learning (Fyfe, 2016). The facilitation of learner-learner interactions can enhance learners' perceived relatedness levels. Collaborative micro-content creation and integration of social networking in online learning platforms facilitates the learners' interaction supporting perceived relatedness (Liao & Zhu, 2012).

#### **4. Discussions and Conclusions**

The current study proposes a model to enhance student teachers' motivation in blended learning by incorporating micro-learning that supports the learner-content, learner-instructor and learner-learner interactions.

Research has already addressed the importance of enhancing learner-content, learner-instructor and learner-learner interactions (Powell, & Bodur, 2019). The importance of motivation in online learning is a critical research issue (Hartnett, 2016). Motivation to learn is usually transformed to engagement (Boekaerts, 2016) and engagement is considered a necessary prerequisite for learning (Fredricks, Blumenfeld, & Paris, 2004). Also, students' participation in blended learning activities may influence their learning outcomes (Zacharis, 2015). Previous studies have shown that by supporting the autonomy, competence and relatedness needs of learners is likely to enhance online engagement and achievement (Chen, 2010).

The proposed model, not only intends to support the learner-content, learner-instructor and learner-learner interactions in a blended learning environment and to enhance perceived autonomy, competence and relatedness, but it is also a promising approach to face other challenges of blended learning such as: (1) incorporating flexibility, (2) stimulating interaction, (3) facilitating students' learning processes, and (4) fostering an affective learning climate (Boelens, De Wever, & Voet, 2017). We argue that the suggested micro-learning-based approach is a means of incorporating flexibility and stimulating interactivity as well. Moreover, the proposed model can be utilized in the design of more intrinsically motivating

MOOCs, increasing their low completion rates (Jordan, 2014). However, micro-learning should be used with caution in order to avoid the possibility of delivering low quality fragmented learning experiences.

The development and evaluation of our proposed micro-learning based blended learning model in the context of pre-service and in-service teacher education can provide empirical evidence for the effectiveness of the suggested approach.

## References

- Baragash, R.S., & Al-Samarraie, H. (2018). Blended learning: Investigating the influence of engagement in multiple learning delivery modes on students' performance, *Telematics and Informatics*, 35, 2082–2098
- Boelens, R., De Wever, B., & Voet, M. (2017). Four key challenges to the design of blended learning: A systematic literature review. *Educational Review Research*, 22, 1–18.
- Boekaerts, M. (2016). "Engagement as an inherent aspect of the learning process". *Learning and Instruction*, vol. 43, pp. 76-83.
- 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.
- Deng, H., Shao, Y., Tang, Y. & Qin, Z. (2014). How micro lecture videos trigger the motivation of learners of Coursera: A comparative study based on ARCS model, *International Conference of Educational Innovation through Technology*, Brisbane, 2014, pp. 117-122.
- Friedler, A. (2018). "Teachers Training Micro-Learning Innovative Model: Opportunities and Challenges," 2018 Learning With MOOCs (LWMOOCs), Madrid, 2018, pp. 63-65.
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. (2004). School engagement: Potential of the concept: State of the evidence. *Review of Educational Research*, 74,59-119.
- Fyfe, E. R. (2016). Providing feedback on computer-based algebra homework in middle school classrooms. *Computers in Human Behavior*, 63, 568–574.
- Graham, C. R., Allen, S., & Ure, D. (2005). Benefits and challenges of blended learning environments. In M. Khosrow-Pour (Eds.), *Encyclopedia of information science and technology* (pp. 253–259). Hershey, PA: Idea Group.
- Graham, C. R. (2005). Blended learning systems: Definition, current trends, and future directions. In C. J. Bonk & C. R. Graham (Eds.), *Handbook of blended learning: Global perspectives, local designs* (pp. 3–21). San Francisco, CA: Pfeiffer Publishing.
- Hartnett, M. (2016). *Motivation in online-education*, Springer, Singapore (2016).
- Hartnett, M., St. George, A. St.; & Dron, J. (2011). Examining motivation in online distance learning environments: Complex, multifaceted and situation-dependent. *The International Review of Research in Open and Distributed Learning*, 12(6), 20-38,
- Hug, T., Lindner, M., & Bruck, P.A. (2006). *Microlearning: Emerging concepts, practices and technologies after e-learning*, In *Proceedings of Microlearning*. Innsbruck: Innsbruck University Press.
- Jordan, K. (2014). Initial trends in enrolment and completion of massive open online courses. *International Review of Research in Open and Distance Learning*, 15 (1) 133-169.

- Liao, S., & Zhu, C. (2012). Micro-learning based on social networking, Proceedings of 2nd International Conference on Computer Science and Network Technology (pp.1163-1166), Changchun.
- Moore, M. G. (1989). Editorial: three types of interaction. *The American Journal of Distance Education*, 3(2), 1-6.
- Muilenburg, L. Y., & Berge, Z. L. (2005). Student barriers to online learning: A factor analytic study. *Distance Education*, 26(1), 29-48. doi: 10.1080/01587910500081269
- Niemiec, C.P. & Ryan, R.M. (2009). "Autonomy, competence, and relatedness in the classroom. Applying self-determination theory to educational practice". *Theory and Research in Education*, vol. 7, no. 2, pp. 133–144.
- Nikou, S.A. & Economides, A.A. (2017). Mobile-Based Assessment: Integrating acceptance and motivational factors into a combined model of Self-Determination Theory and Technology Acceptance. *Computers in Human Behavior*, 68, 83-95,
- Nikou, S.A., & Economides, A.A. (2018). Mobile-Based micro-Learning and Assessment: Impact on learning performance and motivation of high-school students. *Journal of Computer Assisted Learning*, 1–10,
- Pimmer, C., & Pachler, N. (2014). Mobile learning in the workplace: Unlocking the value of mobile technology for work-based education. In M. Ally, & A. Tsinakos (Eds.), *Perspectives on open and distance learning: Increasing access through mobile learning* (pp. 193–204). Athabasca University Press
- Ping, C. Schellings, G., & Beijaard, D. (2018). Teacher educators' professional learning: A literature review, *Teaching and Teacher Education*, 75, 93-104.
- Powell, C.P. Bodur, Y. (2019). Teachers' perceptions of an online professional development experience: Implications for a design and implementation framework, *Teaching and Teacher Education* 77, 19-30
- Ross, J. D. (2011). *Online professional development: Design, deliver, succeed!* Thousand Oaks, CA: Corwin.
- Ryan, R.M. & Deci, E.L. (2000). "Intrinsic and extrinsic motivations: Classic definitions and new directions", *Contemporary Educational Psychology*, vol. 25, no. 1, pp. 54–67.
- Ryan, R. M. & Deci, E. L. (2000b). "Self-determination theory and the facilitation of intrinsic motivation, social development, and wellbeing", *American Psychologist*, vol. 55, pp. 68-78.
- Semington, P., Crosslin, M., & Dellinger, J. (2015). Microlearning as a tool to engage students in online and blended learning. In D. Rutledge, & D. Slykhuis (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference* (pp. 474-479). Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).
- Sun, G., Cui, T., Yong, J., Shen, J., & Chen, J. (2015). Drawing micro learning into MOOC: Using fragmented pieces of time to enable effective entire course learning experiences. In *IEEE 19th International Conference on Computer Supported Cooperative Work in Design* (pp. 308-313), Calabria.
- Werkle, M., Schmidt, M., Dikke, D., & Schwantzer, S. (2015). Technology enhanced workplace Learning. In S. Kroop, A. Mikroyannidis, & M. Wolpers (Eds.), *Responsive open learning environments: Outcomes of research from the ROLE project* (pp. 159–184). Cham: Springer International Publishing.
- Zacharis, N. Z. (2015). A multivariate approach to predicting student outcomes in web-enabled blended learning courses, *The Internet and Higher Education*, 27, 44-53.