



EXPANDING BLENDED LEARNING SCENARIOS: HOW TO EMPOWER ADULT LEARNERS TO PERSIST?

Ellen Van Twembeke, Katie Goeman, Luc De Grez, Jan Elen, KU Leuven, Belgium

Abstract

Blended learning, the seamless integration of online and face-to-face instruction, especially appeals to adult learners. However, it was repeatedly shown that learners' persistence tends to be low in blended environments due to insufficient self-regulation skills. While in search of effective self-regulated learning (SRL) interventions to improve adult learners' retention in blended learning contexts, our systematic review disclosed that scholars can not fall back on a suitable empirical knowledge base. The SRL-persistence relationship is seldom simultaneously addressed, the studied instructional context differs often from blended learning, adult learners are not targeted and/or the empirical approach entails static parameters. In order to expand blended learning scenarios aimed at SRL to improve adult learners' persistence, further scrutiny is necessary. We argue that such research requires not only dynamic and context-related measures of learners' SRL behaviours and persistence but also has to act upon learners' progress through adaptable and timeable SRL interventions.

Introduction

Blended learning is rooted in the online and face-to-face organization of content, activities, assignments, and meetings – “using the web for what it does best and using class time for what it does best” (Osguthorpe & Graham, 2003 p.227). This flexibility especially appeals to adults, who seek out learning opportunities that fit within their work and family responsibilities (Park & Choi, 2009). In spite of their growth, persistence rates tend to be low in blended learning environments (Goeman & Deschacht, 2014). Student persistence or retention refers to completing a learning course or programme, despite the presence of adverse circumstances (Burns, 2013). Studies on learners' persistence often seem to focus on opposing concepts describing early withdrawal from learning programmes such as drop-out or attrition. We emphasize persistence as learners' study continuance that can be positively influenced (McGivney, 2004).

In order to persist in blended learning programmes learners need adequate self-regulation skills (Bannert & Reimann, 2012; Bernard et al., 2014). In this regard, Zimmerman's theoretical framework (2013) on self-regulated learning (SRL) refers to students' observing and monitoring of their thoughts, behaviours and environmental conditions as well as the selection and use of learning strategies. SRL is not an absolute state of functioning but varies

according to personal efforts and context (Zimmerman & Martinez-Pons, 1990). Therefore, this study is concerned with the interaction between formal training and learners' (meta)cognitive, motivational, behavioural and environmental processes (Bell & Kozlowski, 2008) in settings of online and blended learning.

Starting point of the present study was the quest for effective interventions on adult learners' SRL aimed at improving their persistence in blended learning environments. The results would enable us to conceptualize design principles with regard to self-regulation in blended learning contexts (Bernard et al., 2014) and to scrutinize these in follow-up design-based research.

Searching the literature: A systematic review approach

Main objective of the current study is identifying effective interventions on adult learners' SRL which improve adult learners' retention in contexts of blended learning. For this purpose, we carried out a systematic review study. To be included, articles had to:

- be written in English;
- be peer reviewed;
- involve empirical interventions on SRL, in particular experimental designs (Kirk, 1982) that randomly assigned participants to experimental conditions and measured the effect of SRL interventions on persistence/retention;
- target a student population of adult learners;
- be conducted in the context of blended learning.

The concepts of adult learners and blended learning were always incorporated in the search command. In most studies, no direct reference was made to the concept of blended learning. Instead, articles often discussed fully online or technology-enabled learning (e.g. Sitzmann et al., 2008). In order to avoid a major narrowing of search results and partly because it is especially the online space of blended environments that requires SRL (Bernard et al., 2014), these terms and related keywords were also included in our search strategy.

'SRL' was combined with 'persistence' or 'retention' as well as inserted as a single variable, taking into account that studies could include persistence as one of the measured effects and not necessarily as a single research outcome. In order to refer to the act of improving SRL, we based possible verbs (e.g. 'fostering', 'enhancing', 'supporting') on a mid-term review of keywords used by the authors of retrieved studies.

Information retrieval (without date restrictions) was conducted between November 2014 and January 2015 in the databases ERIC, PSYCArticles, Web of Science and EBSCO. These databases were searched using a combination of key terms: "support" / "foster" / "enhance" / "design" / "promote" / "improve" / "help" / "scaffold" / "intervention" AND/OR "self-regulat*" AND "adults" / "adult learners" / "mature learners" AND "blended learning" OR "online learning" OR "technology-delivered instruction" OR "technology-enabled

instruction” OR “web instruction” OR “web-based learning environment” AND/OR “persistence” OR “retention”.

Scope of the literature

Current studies differ from our original problem setting in terms of research context, applied methodology or central concepts. Contextual ambiguities were encountered when adults were just offering assistance to children who were questioned on their use of SRL strategies (e.g. Zimmerman & Martinez-Pons, 1990) and when studies used computer systems solely as a means to conduct experiments without relating to actual online learning environments (e.g. Koriat, Nussinson & Ackerman, 2014).

With respect to methodology, search results returned correlational survey studies relating demographics to SRL ability (e.g. Zhao, Chen & Panda, 2014) or descriptive case studies (e.g. Idan et al., 2011).

Some studies reported SRL interventions exclusively aimed at SRL per se, such as effects of reflection prompts on SRL (van den Boom et al., 2004). Moreover, when SRL interventions were aimed at learning outcomes, the measured effects often differed from persistence/retention. In particular, the relationship between SRL and performance prevails (e.g. Rowe & Rafferty, 2013). Sitzmann, in collaboration with Ely (2010) and Johnson (2012) introduced SRL interventions to examine the effects on both performance and attrition, opposed to the concept of persistence/retention. Attrition was lowest when reflective questioning was prompted throughout the learning process (2010) and when trainees followed through on the plan to devote substantial time to training (2012).

Running the above screening process, two studies were retained where persistence was included as a learning effect among a larger set of learning outcomes. In the first study by Kramarski and Michalsky (2009) 194 first-year pre-service teachers were randomly assigned to one of four instructional methods: e-learning (EL) or face-to-face (F2F) learning, whether or not supported by SRL instruction. Experimental groups were trained in the importance of SRL and a metacognitive self-questioning method. Subsequently, they received self-questioning before each practice of pedagogical skills, prompting them to reflect. Experimental pre-service teachers in the e-learning condition reported higher persistence in learning, compared to the F2F and control group. In the second study, Hu and Driscoll (2013) examined the influence of a web-based SRL strategy training on the achievement, motivation and self-reported strategy use of 21 undergraduate students. Similar to the first study, the intervention consisted of a training and prompting part. First, students received an online tutorial and exercises on what, when and how to use SRL strategies. Afterwards, they were encouraged to apply the strategies throughout the course, completing a series of interactive online questionnaires. Learners who received training in SRL and were prompted to reflect on their strategy use, had a higher tendency to persist compared to the control condition.

In short, current literature seldom simultaneously addresses the SRL-persistence relationship in the instructional context of blended learning and adult education. The retained studies by Kramarski and Michalsky (2009) and Hu and Driscoll (2013) did cover this problem setting but are open to methodological improvement. Therefore, before we can build on current SRL intervention guidelines aimed at improving adult learners' persistence in blended environments, these are the very foundations that require further reflection.

Methodological issues

Applied SRL and persistence measurements in both Kramarski and Michalsky (2009) and Hu and Driscoll (2013), have shortcomings in terms of objectivity, fitting in with the learning context and the ability to capture and act upon the dynamics of the learning process.

With respect to the measurement of SRL, both studies adapted the Motivational Strategies for Learning Questionnaire (MSLQ) by Pintrich, Smith, Garcia and McKeachie (1991), a prevailing tool for assessing SRL (Saks & Leijen, 2014). However, self-report measurements have been criticized for failing to register students' actual strategy use as they rely on biased long term memory or are likely to incite socially desirable answers (Hughes, 2013).

Moreover, since the MSLQ was designed to measure SRL strategies in face-to-face classrooms, it may become invalid in online learning settings. While the Online Self-Regulated Learning Questionnaire (OSLQ) was presented as a measurement of SRL strategies in wholly or partially web-based environments, it does not contain items on motivation and therefore falls short as an alternative to the MSLQ (Barnard et al., 2009; Goda, 2012).

By using the MSLQ, both studies only measured SRL as an aptitude or trait, generalizing student actions across learning situations. However, given the domain specific nature of SRL behaviour, analyzing self-regulatory traits also makes assumptions about self-regulatory states (Leidinger & Perels, 2012). Since "there is no general ability without reference to the environment" it is desirable that the specific learning event students are experiencing, is taken into account (Beck & Breuer, 2004, p.8). Furthermore, SRL is a continuous process (Sitzmann et al., 2008). However, both studies applied a pre- and post-test measurement which fails to seize the changes in students' SRL throughout the learning process. In this context, Winne and Perry's (2005) process models advocate the assessment of students' SRL over time, through for instance think-aloud protocols.

When turning to the concept of persistence, both studies applied a different measurement approach. Kramarski and Michalsky (2009) did not address persistence as a stand-alone measure but extracted a motivational construct from the MSLQ. By contrast, Hu and Driscoll (2013) obtained data on students' learning achievement from the course instructor. Next to questionnaires (e.g. Lee & Choi, 2013) and administrative student records (e.g. Dirks & Jha, 1994), persistence measurements also rely on the online tracking of activity trends (e.g. Morris, Finnegan & Wu, 2005). Although these studies measure persistence in a variety of ways, they share a static approach towards the concept, only registering persistence rates without acting to improve retention.

When we consider the intervention design of Kramarski and Michalsky (2009) and Hu and Driscoll (2013), we note that the timing and content of SRL training and prompts were part of a pre-fixed outline. Although this area of concern was not empirically addressed, authors of both studies acknowledge the need to observe and monitor learning processes – be it with respect to providing adapted support to learners with varying levels of SRL (Kramarski & Michalsky, 2009) or to “data-mining for more individualized SRL guidance and more effective control for study drop-out to cultivate more 21st century competent e-learning completers” (Hu & Driscoll, 2013, p.180).

Conclusion

The present study focused on identifying interventions on adult learners’ SRL aimed at improving their persistence in blended learning environments. However, the systematic literature review revealed a lack of relevant empirical evidence. The SRL-persistence relationship is seldom simultaneously addressed, the studied instructional context differs often from blended learning or adult learners are not targeted. Moreover, the empirical approaches entail static parameters and focus mainly on university education and single (online) courses.

In order to know *how to* expand blended learning scenarios in terms of strengthening adult learners’ SRL so that their persistence will improve, further scrutiny is necessary. Such research requires not only dynamic and context-related measures of learners’ SRL behaviours and persistence but also has to act upon learners’ progress through adaptable and timeable SRL interventions.

Departing from this problem setting, our future research aims i) to identify the particular points in time when students’ persistence is significantly challenged and ii) to define which SRL interventions, either online or face-to-face, could be implemented within a blended learning programme. This follow-up research will be carried out in close cooperation with several Adult Education Centres throughout different regions in Belgium. Ultimate aim is to find solutions for increasing participation in lifelong learning, one of the key issues in the European 2020 policy framework (European Commission, 2013).

References

1. Bannert, M. and Reimann, P. (2012). Supporting self-regulated hypermedia learning through prompts. In *Instructional Science*, 40(1), (pp. 193–211). DOI: 10.1007/s11251-011-9167-4
2. Barnard, L.; Lan, W.Y.; To, Y.M.; Paton, V.O.; Lai, S.L. (2009). Measuring self-regulation in online and blended learning environments. In *The Internet and Higher Education*, 12(1), (pp. 1-6). DOI: 10.1016/j.iheduc.2008.10.005
3. Beck, K. and Breuer, K. (2004). *The development of traits of self-regulation in vocational education and training*. A Longitudinal Study. Retrieved from: http://www.wipaed.uni-mainz.de/ls/ArbeitspapiereWP/gr_Nr.51.pdf
4. Bell, B.S. and Kozlowski, S.W.J. (2008). Active Learning: Effects of Core Training Design Elements on Self-Regulatory Processes, Learning, and Adaptability. In *Journal of Applied Psychology*, 93(2), (pp. 296–316). DOI: 10.1037/0021-9010.93.2.296
5. Bernard, R.M.; Borokhovski, E.; Schmid, R.F.; Tamim, R.M.; Abrami, P.C. (2014). A meta-analysis of blended learning and technology use in higher education: from the general to the applied. In *Journal of Computing in Higher Education*, 26(1), (pp. 87-122). DOI: 10.1007/s12528-013-9077-3
6. Burns, M. (2013). Staying or leaving? Designing for persistence in an online educator training programme in Indonesia. In *Open Learning*, 28(2), (pp. 141–152). DOI:10.1080/02680513.2013.851023
7. Dirks, J.M. and Jha, L.R. (1994). Completion and attrition in adult basic education: a test of two pragmatic prediction models. In *Adult Education Quarterly*, 45(1), (pp. 269-285). DOI: 10.1177/0741713694045001002
8. European Commission (2013). *Online Education and Training Monitor Adult participation in lifelong learning*. Retrieved from: http://ec.europa.eu/education/dashboard/lll/lifelong_en.htm
9. Goda, Y. (2012). *Formative Assessment and Support for Students' Self-Regulated Learning in E-learning*. Symposium Summary. Retrieved from: http://www.code.ouj.ac.jp/sympo/2012/pdf/5_YoshikoGoda_8.pdf
10. Goeman, K. and Deschacht, N. (2014). Persistence and Performance of Adult Learners in Blended Business Education. In the *Proceedings of the World Conference on Educational Multimedia, Hypermedia and Telecommunications*, (pp. 459-479).
11. Hu, H. and Driscoll, M. P. (2013). Self-Regulation in e-Learning Environments: A Remedy for Community College? In *Educational Technology & Society*, 16(4), (pp. 171–184). Retrieved from: http://www.ifets.info/journals/16_4/14.pdf
12. Hughes, G. (2007). Using blended learning to increase learner support and improve retention. In *Teaching in Higher Education*, 12(3), (pp. 349-363). DOI:10.1080/13562510701278690

13. Idan, E.; Abrami, P.C.; Wade, A. and Meyer, E.J. (2011). Designing for self-regulation: the development of a web-based digital portfolio for adult learners. In the *Proceedings of the 5th International Technology, Education and Development Conference*, (pp. 2127-2135). 7-9 March, 2011, Valencia, Spain. Retrieved from: <http://library.iated.org/view/IDAN2011DES>
14. Kirk, R.E. (1982). *Experimental design: Procedures for the behavioral sciences* (2nd ed.). Pacific Grove, California.: Brooks/Cole.
15. Koriat, A.; Nussinson, R. and Ackerman, R. (2014). Judgments of Learning Depend on How Learners Interpret Study Effort. In *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 40(6), (pp. 1624–1637). DOI: 10.1037/xlm0000009
16. Kramarski, B. and Michalsky, T. (2009). Investigating Preservice Teachers' Professional Growth in Self-Regulated Learning Environments. In *Journal of Educational Psychology*, 101(1), (pp. 161–175). DOI: 10.1037/a0013101
17. Lee, Y. and Choi, J. (2013). A structural equation model of predictors of online learning retention. In *Internet and Higher Education*, 16, (pp. 36–42). DOI: 10.1016/j.iheduc.2012.01.005
18. Leidinger, M. and Perels, F. (2012). Training Self-Regulated Learning in the Classroom: Development and Evaluation of Learning Materials to Train Self-Regulated Learning during Regular Mathematics Lessons at Primary School. In *Education Research International. Vol. 2012*. DOI: 10.1155/2012/735790
19. McGivney, V. (2004). Understanding persistence in adult learning. In *Open Learning*, 19(1), (pp. 33-46). DOI: 10.1080/0268051042000177836
20. Morris, L.V.; Finnegan, C. and Wu, S-S. (2005). Tracking student behavior, persistence, and achievement in online courses. In *Internet and Higher Education*, 8(3), (pp. 221–231). DOI:10.1016/j.iheduc.2005.06.009
21. Osguthorpe, R.T. and Graham, C.R. (2003). Blended learning environments: Definitions and directions. In *Quarterly Review of Distance Education*, 4(3), (pp. 227-234). Retrieved from <http://eric.ed.gov/?id=EJ678078>
22. Park, J.-H. and Choi, H.J. (2009). Factors Influencing Adult Learners' Decision to Drop Out or Persist in Online Learning. In *Educational Technology & Society*, 12(4), (pp. 207–217). Retrieved from http://ifets.info/journals/12_4/18.pdf
23. Pintrich, P.R.; Smith, D.A.F.; Garcia, T. and McKeachie W.J. (1991). *A Manual for the Use of the Motivated Strategies for Learning Questionnaire (MSLQ)*. Michigan: National Center for Research to Improve Post-secondary Teaching and Learning.
24. Rowe, F.A. and Rafferty, J.A. (2013). Instructional Design Interventions for Supporting Self-Regulated Learning: Enhancing Academic Outcomes in Postsecondary E-Learning Environments. In *MERLOT Journal of Online Learning and Teaching*, 9(4), (pp. 590-601). Retrieved from: http://jolt.merlot.org/vol9no4/rowe_1213.pdf

25. Saks, K. and Leijen, A. (2014). Distinguishing Self-Directed and Self-Regulated Learning and Measuring them in the E-learning Context. In *Procedia – Social and Behavioral Sciences*, 112, (pp. 190-198). DOI: 10.1016/j.sbspro.2014.01.1155
26. Sitzmann, T.; Bell, B.S.; Kraiger, K.; Kanar, A.M. (2008). A multilevel analysis of the effect of prompting self-regulation in technology-delivered instruction (CAHRS Working Paper). Retrieved from Cornell University, ILR School site: <http://digitalcommons.ilr.cornell.edu/articles/394>
27. Sitzmann, T. and Ely, K. (2010). Sometimes You Need a Reminder: The Effects of Prompting Self-Regulation on Regulatory Processes, Learning, and Attrition. In *Journal of Applied Psychology*, 95(1), (pp. 132–144). DOI: 10.1037/a0018080.
28. Sitzmann, T. and Johnson, S.K. (2012). The Best Laid Plans: Examining the Conditions Under Which a Planning Intervention Improves Learning and Reduces Attrition. In *Journal of Applied Psychology*, 97(5), (pp. 967–981). DOI: 10.1037/a0027977
29. van den Boom, G.; Paas, F.; van Merriënboer, J.J.G.; van Gog, T. (2004). Reflection prompts and tutor feedback in a web based learning environment: effects on students' self-regulated learning competence. In *Computers in Human Behavior*, 20(4), (pp. 551–567). DOI: 10.1016/j.chb.2003.10.001
30. Winne, P.H. and Perry, N.E. (2005). Measuring self-regulated learning. In M. Boekaerts, P.R. Pintrich & M. Zeidner (eds.), *Handbook of self-regulation*, (pp. 532-568). San Diego, CA: Academic Press.
31. Zhao, H.; Chen, L. and Panda, S. (2014). Self-regulated learning ability of Chinese distance learners. In *British Journal of Educational Technology*, 45(5), (pp. 941–958). DOI: 10.1111/bjet.12118
32. Zimmerman, B.J. and Martinez-Pons, M. (1990). Student Differences in Self-Regulated Learning: Relating Grade, Sex, and Giftedness to Self-Efficacy and Strategy Use. In *Journal of Educational Psychology*, 82(1), (pp. 51-59). DOI: 10.1037//0022-0663.82.1.51
33. Zimmerman, B.J. (2013). From Cognitive Modeling to Self-Regulation: A Social Cognitive Career Path. In *Educational Psychologist*, 48(3), (pp. 135–147). DOI: 10.1080/00461520.2013.794676

Acknowledgements

The authors acknowledge the support of the Agency for Innovation by Science and Technology (IWT) through its grant (N° 140029) for Strategic Basic Research (SBO) in the Adult Learners Online! (ALO) project on 'Blended and Online Learning in Adult Education and Training'.