Routledge
Taylor & Francis Group

Teaching in Higher Education
Critical Perspectives

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/cthe20

The mARC instructional design model for more experiential learning in higher education: theoretical foundations and practical guidelines

Slaviša Radović , Hans G. K. Hummel & Marjan Vermeulen

To cite this article: Slaviša Radović , Hans G. K. Hummel & Marjan Vermeulen (2021): The mARC instructional design model for more experiential learning in higher education: theoretical foundations and practical guidelines, Teaching in Higher Education

To link to this article: https://doi.org/10.1080/13562517.2021.1872527

Published online: 17 Jan 2021.

TEACHING IN HIGHER EDUCATION
https://doi.org/10.1080/13562517.2021.1872527

The mARC instructional design model for more experiential learning in higher education: theoretical foundations and practical guidelines

Slaviša Radović, Hans G. K. Hummel and Marjan Vermeulen

Faculty of Educational Sciences, Open University of the Netherlands, Heerlen, The Netherlands

ABSTRACT

The concept of lifelong learning is becoming increasingly important in contemporary educational research and development. Although the relationship between experience (practice) and knowledge (theory) is becoming an important aspect of the formal learning process, current instructional design models do not point to educational strategies that support learners in re- and de-contextualisation (both directions of Kolb's learning cycle). This article aims to provide more insight into the process of creating and redesigning experiential learning environments and to better understand the complex relationship that exists between the learning environments and experiential learning (considering underlying learning theories). We will present and discuss mARC (more Authentic, Reflective and Collaborative), a three-component instruction model with a set of instructional elements proved to facilitate the re- and de-contextualisation of knowledge. This article ends with practical guidelines for using the mARC model to support students in linking learning experience to academic knowledge development within higher education.

ARTICLE HISTORY
Received 15 October 2019
Accepted 10 December 2020

KEYWORDS
Experiential learning; higher education; instructional design; authenticity; reflection; collaboration

1. Introduction

'The necessity of lifelong learning' is a need underneath many educational reforms, government policy plans, and within organisations like the Organisation for Economic Co-operation and Development (OECD 2018). The growing complexity of the working place and learners' aspirations for acquiring more knowledge has increased the need for continuous learning (OECD 2019). Recent efforts to improve higher education have often mentioned experiential learning (Coulson and Harvey 2013; Groves et al. 2013; Lindsey and Berger 2009). These were seen as a dynamic approach to provide students with both learning experience and academic knowledge (Roberts 2018; Tynjälä, Välimaa, and Sarja 2003). Kolb (1984) proposed that learning is a process in which the learner goes through steps of concrete experience, reflective observation, abstract

CONTACT Slaviša Radović slavisa.radovic@ou.nl Faculty of Educational Sciences, Open University of the Netherlands, P.O. Box 2960, 6401 DL Heerlen, The Netherlands

conceptualisation, and active experimentation in an iterative manner (Kolb 1984, 2015). A considerable body of research shows that experiential learning offers the opportunity for learners to develop the ability to apply theory in practical situations (contextualising knowledge). At the same time, new knowledge can arise from gaining concrete learning experience and be converted into abstract generalisations (de-contextualising knowledge), and also from applying this new generic knowledge in other learning experiences (re-contextualising knowledge). Learning becomes 'really' experiential only if both processes are addressed (Kreber 2001). Moreover, Holman, Pavlica, and Thorpe (1997) and Tynjälä, Välimaa, and Sarja (2003) stressed that while theory and practice shift over time expand and become entangled, learners are involved in deeper and more meaningful understanding.

Although many scholars mention concrete learning experience as a key factor for their theories and educational development, Buschor and Kamm (2015) point out that educators face many challenges in their attempt to support learners in their efforts to practise both their knowledge and learning experiences. The complexity of experiential learning, together with critics of the Kolb's model, is emphasised in a number of studies (Boud, Cohen, and Walker 1993; Castelijns, Vermeulen, and Kools 2013; Roberts 2018). The most frequently mentioned issues are that experiential cycle does not take into account the social aspects of learning, group learning (Boud, Cohen, and Walker 1993; Holman, Pavlica, and Thorpe 1997) or the need for interaction between individuals. Race's (2014) Ripples Model of Learning identifies the fundamental factors underpinning effective experiential learning as motivation, purposeful intention, and the desire to learn. From another perspective, studies criticise the absence of methods to support learners' reflection (Boud, Keogh, and Walker 1985) and their progress through the learning cycle.

Finally, Beard (2008) noted that although organising experiential learning process is a challenge, it 'remains very influential in a pedagogical sense' (5). Moreover, whatever the limitations of Kolb's model are, the contribution cannot be underestimated since it 'helped move educational thought from the focus of the instructor back to the learner' (Kelly 1997, 4). Despite the growing body of research on different aspects of experiential learning, the literature emphasises the need for a better understanding of instructional elements that facilitate the integration of theory, understanding and learning experience (Groves et al. 2013; Matsuo 2015; Roberts 2018).

2. The present research questions

Both concrete experiencing and abstract thinking, being 'two sides of the same medal' of learning, are influencing each other through a complex process (Afdal and Kari 2018; Kreber 2001). Although a number of variants of experiential learning have been proposed (Bergsteiner and Avery 2014; Castelijns, Vermeulen, and Kools 2013), how to design such learning process is still not described in the literature. Besides, Coulson and Harvey (2013, 403) assert that experiential learning in higher education 'requires a degree of structure and planning that is not always required in other forms of experiential learning'. From this standpoint, we aim develop and propose an instructional design

model for facilitating more effective experiential learning. The main research questions underlying this article are

(1) What are the critical instructional elements in an experiential learning environment that support learners in their re- and de-contextualisation of knowledge (*theoretical foundations*)?
(2) What are the learning design principles that facilitate more experiential learning (*practical guidelines*)?

We followed the methodological procedure of Lee and Jang (2014) and the recommendation of Gustafson and Branch (2002) to develop an instructional design model. They suggest using a combination of theory- and practice-driven approaches (hybrid method). We first pointed out important instructional elements, then described and classified these elements, drew causal relationships between them, and finally provided design guidelines for applying the model (Gustafson and Branch 2002; Lee and Jang 2014).

Our article is structured as follows. Section 3 presents the results of a systematic literature review on experiential learning environments we used as a basis for our endeavour (Radović, Hummel, and Vermeulen 2019). Section 4 aims to clarify the model creation, and then continues with introducing the structure of the model and further highlighting the instructional elements and practical guidelines. The article concludes with discussion and recommendations (Sections 5 and 6).

3. Pillars, perils and pearls of experiential learning

For our systematic literature review we used narrative evaluation methods (Radović, Hummel, and Vermeulen 2019) to explore the relation between practice and theory. Previous literature on experiential learning is often criticised for mixing research results from various levels of education, ranging from primary school to higher education, and from different domains of learning (Lindsey and Berger 2009). To facilitate some more profound understanding, our review, therefore, focused on the masters in the educational sciences domain, in order to carefully isolate and explore all instructional characteristics that are relevant in that context. This approach allowed us to discuss and compare results, bearing in mind the specific educational context from which they emerged.

In order to study all relevant literature for that context, we searched for articles by following two phases (according to Petticrew and Roberts 2006). During the first phase, a comprehensive search of various online databases (full list is provided in Table 1) was carried out. We used a Boolean search query with combinations of keywords: Experiential AND (education OR learning OR knowledge) AND (master OR academic OR postgraduate OR graduate) AND teacher to explore the abstract, title, and keywords of articles. The choice of the databases and the search terms was based on the theoretical concept of experiential learning and trial searches of the literature. We expected an overlap between the articles found, as databases sometime involved the same publishers. During the second phase of the literature search, we used bibliographic branching to

Table 1. An overview of the search and evaluation protocol based on PRISMA with the number of articles that were retrieved and passed the criteria within every step of evaluation.

Database	Identified after search	Included after inclusion criteria	Included after exclusion criteria
EBSCO	748	24	9
Web of Science	148	2	1
JSTORE	1058	7	1
SAGE Publishing	2104	6	1
Science Direct	1025	10	4
Springer link	787	6	2
Taylor and Francis	3077	29	8
Wiley Online Library	1504	0	0
Total database search	10451	84	26
Bibliographic branching (26 references lists)	906	5	5
Total number of articles reviewed			31

examine the reference list of each study that had been considered relevant during the first phase.

All identified articles were evaluated based on the inclusion and exclusion criteria that were specified in advance (also according to Petticrew and Roberts 2006). During the first evaluation step, each article was scanned and appraised based on the abstract, title, and keywords (a total of 10.451 articles were thus scanned). To be included in the review, the article had to: (1) explore learning process in a master of educational sciences; (2) focus on experiential learning (in a broad sense); (3) include empirical research methods; (4) be published in a peer-reviewed journal; and (5) be published after 1984. After applying these inclusion criteria, 84 articles were selected for further evaluation. During the second evaluation step, several exclusion criteria were applied by means of thorough reading and quality assessment of the complete articles. Decisive criterions were whether the study provided empirical data, whether the study described a process in which knowledge was created through transfer of knowledge, and whether the study was related to a formal higher education programme. In this way, only 26 articles were left to be included in the review study.

During the process of bibliographic branching (the second phase of literature search) five more studies could be located (906 bibliography items were inspected from 26 selected articles). Each bibliographical list of these five studies was inspected correspondingly, but no more studies were found that could be included in the set of literature. Finally, a total of 31 studies were included.

The review study identified main results which provided us with an overview of important factors for and benefits of experiential learning. First of all, three pillars of experiential learning resulted from the review: (a) learning is a cyclic process related to the nature of the 'real' world beyond the classroom (Authenticity); (b) learners are supported to reflect on knowledge and experience (Reflection); and (c) learning is situated and mediated in a social context (Collaboration). These pillars were almost equally encountered across studies, implemented in various settings, with different learning factors and benefits to enhance experiential learning circle (see Figure 1).

Secondly, the literature review shows that effective experiential learning does not emerge automatically, but that a number of conditions must be fulfilled first. Within

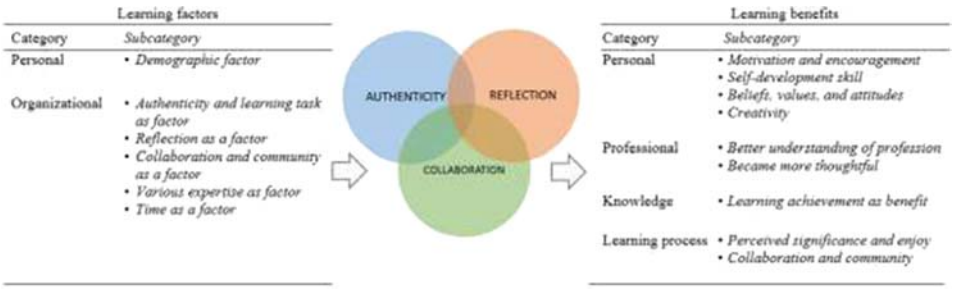

Figure 1. Diagram of (a) learning factors with impact on experiential learning process, (b) pillars used to facilitate experiential learning environments, and (c) perceived benefits from such learning processes.

all facilitating and hindering factors that influence experiential learning process, two groups could be distinguished: Personal and Organisational factors (the full list of subcategories can be found in Figure 1). Facilitating demographic factors include age, previous education, level of education, and work experience (Hagevik, Aydeniz, and Rowell 2012). This first group also includes personal characteristics such as integrity, openness, and commitment (Chi 2013). The Organisational factors group includes factors mainly related to the prevailing characteristics of learning tasks and processes (Korkko, Kyro-Ammala, and Turunen 2016). Identified factors within this group included different aspects of authenticity, reflection, collaboration and community as essential characteristics of the learning processes. Moreover, various expertise and feedback during learning process was seen as a factor for learning (Korkko, Kyro-Ammala, and Turunen 2016). Some studies argue (Hagevik, Aydeniz, and Rowell 2012; Korkko, Kyro-Ammala, and Turunen 2016) that the variety of previous experience between students can influence learning and support reflection in groups. The final subcategory mentions time (prolonged reflection, reflection over longer time period and time spent during reflective writing) as a facilitating factor (Leijen et al. 2014).

Thirdly, the review revealed a variety of benefits of experiential learning. Four categories of learning benefits could be distinguished: Personal, Professional, Knowledge and Learning processes (see Figure 1). Personal benefits reported include four subcategories: Motivation and encouragement; Self-development skill; Beliefs, values, attitudes; and Creativity (Chi 2013). Students were reporting to be more motivated, to feel better as a learner, and to believe in the benefits of the course. Most reported professional benefits of experiential learning are placed in two subgroups: Better understanding of profession and practice and Becoming more thoughtful, reflective and critical (Sutherland and Markauskaite 2012). Knowledge and Learning achievement benefits reported include developing deeper understanding, broader knowledge, and having greater achievement and success (Hagevik, Aydeniz, and Rowell 2012; Sutherland and Markauskaite 2012).

From the literature review it also appears that effective experiential learning is challenging to organise. Main factors mentioned as hindering include the struggle to work in groups, relation between team members, and lack of trust which diminished group harmony (Leijen et al. 2014). Furthermore, reflection without guiding leads to the feeling that the process is difficult and less beneficial (Leijen et al. 2014). The amount

of negative consequences reported were significantly lower than the number of benefits; however, authors pointed out that special attention must be given to this group of factors in order to assure effectiveness of the learning.

4. The mARC instructional design model

The aim of this article is to produce the instructional model to serve both as a conceptual tool providing scholars with an understanding of inter-related instructional elements proved to facilitate experiential learning, and as a procedural tool that guides educators while designing and revising learning environments (Lee and Jang 2014). The mARC model does not claim to portray all instructional elements that could influence learning, but defines a set of core elements that have proved to significantly strengthen the ties between theory (abstract knowledge) and practice (concrete experience).

The hybrid method used to design the instructional model allowed us to first investigate empirical results to extract instructional elements and learning design principles (Gustafson and Branch 2002; Lee and Jang 2014). The point of departure for this step was grounded in the review study (Radović, Hummel, and Vermeulen 2019) that argued facilitating and hindering factors that influence experiential learning process. Furthermore, we analysed those elements and clustered them according to the identified pillars of Authenticity, Reflection, and Collaboration. Finally, the underlying learning theories were used to explore relations among instructional elements, providing more clarity on their learning impact and mutual interdependencies. The instructional elements within each pillar of the model were further sub-clustered according to their influence (1) locally within the pillar – *fostering role*, and (2) in relation to the whole model – *strengthening role*. Instructional elements with fostering roles are seen to complement the pillar they belong to: the 'pearls' of their underlying learning theory. Instructional elements with strengthening roles are to relate the pillar with the rest of the learning model, making the learning instructions complete (see Figure 2).

Regarding the conceptual aspects of the mARC model, in the next subsections each pillar of the model will be described, as well as their most critical elements, and their founding learning theory, respectively for authenticity (Subsection 4.1), reflection (Subsection 4.2) and collaboration (Subsection 4.3). This will be followed with a presentation of the procedural aspects of the model and more practical (design) guidelines (Subsection 4.4).

4.1. Authenticity as pillar of the mARC model

That learning activities need to be more authentic and work-oriented was recognised during the mid-1980s. Over the past decades, authenticity has been identified as a way to support knowledge re- and de-contextualisation (Ashford-Rowe, Herrington, and Brown 2014; Herrington and Oliver 2000; Ursin and Paloniemi 2019; Villarroel et al. 2019). According to Gulikers et al. (2008) authenticity is defined and determined by the extent to which professional situations, reassembled in a learning environment, are relevant to the learner. Wald and Harland (2017) assert that meaningful learning is best placed in the context within which the learning experience and knowledge can

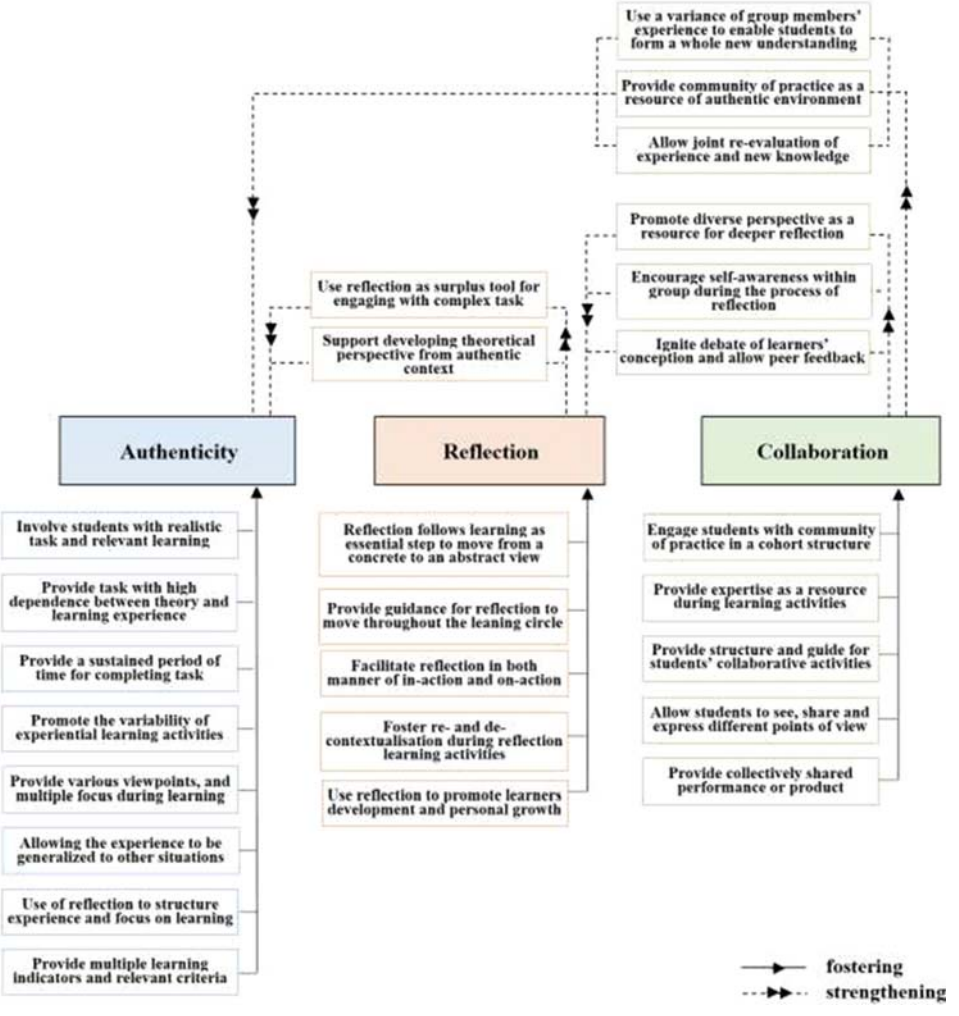

Figure 2. The mARC instructional design model.

emerge. Authentic tasks provide an outline to encourage both re- and de-contextualising processes and enlarge students' capacity to integrate understanding with practical learning experience.

However, designing authentic learning environments seems to be challenging with many barriers impeding successful transfer of learning and effective learning processes (Tynjälä, Välimaa, and Sarja 2003; Villarroel et al. 2019). In Table 2, critical elements from the Authenticity pillar of the model are described with respect to the review study's findings on facilitating more experiential learning.

4.2. Reflection as pillar of the mARC model

As cited by many, a pioneer in the field Dewey (1933) defined reflection as the active, persistent and careful consideration of any belief or supposed form of knowledge in

Table 2. Brief introduction and description of critical elements of Authenticity.

Elements	Elements description
Involve students with realistic tasks and relevant learning (Wenzlaff and Wieseman 2004).	The first form of 'realism' is when students are able to identify relations between learning outcomes and learning process. Learning process should question student knowledge and exercise their higher levels of thinking, while focused on relevant learning outcome, product or performance (Ashford-Rowe, Herrington, and Brown 2014; Wald and Harland 2017). Rather than forcing students to remember procedures and facts (Elvira et al. 2017).
Provide tasks with high dependence between theory and learning experience (Celik 2012).	The second form of 'realism' is the presence of a real context (Gulikers et al. 2008) that reflects the complexity of real work settings (Villarroel et al. 2019). Professional situations, reassembled in a learning environment, engage learners in more meaningful learning (Herrington and Kervin 2007). More importantly, learners' perceptions of the dependence between knowledge and experience facilitate the processing of learning experiences at a deeper level of reasoning in order to construct theory (re-contextualisation).
Provide a sustained period of time for completing task (Bain et al. 1999)	Solving complex tasks over a longer period of time has the potential to increase the ability of students to think more critically, reason effectively, and build understanding while looking at learning experience (Bain et al. 1999; Ursin and Paloniemi 2019). Moreover, sufficient time is needed for learners to be able to see and investigate all the connections between task, learning experience and academic context (Ashford-Rowe, Herrington, and Brown 2014; Elvira et al. 2017).
Promote the variability of experiential learning activities (Aiken and Day 1999)	Students should move through experiential learning cycle without consistency and fixed patterns in order to see the complexity of concepts that need to be understood (Elvira et al. 2017; Herrington and Kervin 2007). Moreover, when learners are challenged to associate between various and different learning experiences, it is likely that a coherent and more structured understanding will be developed.
Provide various viewpoints on, and multiple foci during learning (Hagevik, Aydeniz, and Rowell 2012)	Herrington and Kervin (2007) pointed out that providing opportunities for learners to explore different perspectives during learning can support explicating procedural knowledge into conceptual and vice versa. In addition, different angles or approaches during learning processes provoke a wide range of cognitive strategies, such as 'repetition, elaboration, analysis, organisation or deduction' (Elvira et al. 2017, 195).
Allow the experience to be generalised to other situations (Howard, McClannon, and Wallace 2014)	Learners should be provided with a mechanism to go beyond the reproduction of fragments of learning experience to achieve a deeper understanding (de-contextualisation) (Villarroel et al. 2019). Such a procedure can lead to further use of knowledge, or re-contextualisation to other, unrelated situations (Elvira et al. 2017). However, something learned in one situation is often not easy to transfer to other problems, situations and contexts (Tynjälä, Välimaa, and Sarja 2003).
Use reflection to structure experience and focus on learning (Korkko, Kyro-Ammala, and Turunen 2016)	Reflection should be used as a mechanism to connect learning experience with a broader context of knowledge, in an endeavour of making new understanding or solving complex tasks (Slavich and Zimbardo 2012). Elvira et al. (2017, 196) state that through reflection 'tacit knowledge can become explicit'.
Provide multiple learning indicators and relevant criteria (Cowan 2012)	Learning indicators should be a true representation of the criteria the learner has to meet in real-life or professional carrier (Herrington and Oliver 2000). Moreover, students should be able to estimate their effort with desired standards and to plan their learning activities using skills of self-monitoring, planning and self-evaluation (Elvira et al. 2017).

the light of the grounds that support it and the further conclusion to which it tends. In addition to Dewey, a great theoretical contribution to the theory of reflection was provided by Schön (1983). He defined the strategies of reflecting-in-action (thinking about doing something while doing it) and reflecting-on-action (thinking after an action has been done).

As a reflective learner, one can develop a deeper understanding of one's own experience and link it to academic theories during the course of active reflection (when moving through the processes: experiencing, reflecting, thinking, and acting) (Boud, Keogh, and Walker 1985; Kolb 2015; Larrivee 2000). Hence, the importance of reflection in higher education, and across disciplinary fields, is widely recognised (Mezirow 1981; Slavich and Zimbardo 2012). However, critical thinking will neither occur spontaneously nor is it a simplistic process (Boud, Keogh, and Walker 1985). In Table 3, the critical elements from the reflection pillar are described in respect to the ways in which they enhance more experiential learning and support both processes of re- and de-contextualisation.

4.3. Collaboration as pillar of the mARC model

The belief that knowledge is constructed through interaction with others is not new, but gains increasingly more attention in educational research and practice (Lave and Wenger 1991; Teräs 2016; Weinberger and Fischer 2006). Collaborative learning refers to an instructional strategy in which learners work actively together in groups with shared aims (Johnson and Johnson 2009).

According to the extensive literature, learning in a group can be organised in various ways, with different learning mechanisms, interactions and learning situations. While Wald and Harland (2017) assert that the authenticity should be socially constructed, Buschor and Kamm (2015) further point out that learners should be encouraged to collaboratively reflect on authentic experience. Furthermore, many researchers asserted that peer reflection supports engagement with learning tasks, promotes developing scientific argumentation skills, endorses academic growth and improves understanding of experience (Weinberger and Fischer 2006). In Table 4, essential critical elements from the collaboration pillar are described in respect to the ways in which they enhance more experiential learning.

4.4. Practical (design) guidelines

Lee and Jang (2014) suggest a different way to use an instructional design model for designing learning experiences, courses, and educational content. The vast majority of the models involve a number of instructional components (strategies) to be considered during one complex design phase (applying a cumulative approach). In contrast to these methods, the mARC model suggests shifting the design focus across three stages – with different foci on the pillars of Authenticity, Reflection and Collaboration (applying an iterative approach, see Figure 3). Each stage should include all five phases of the ADDIE framework (Analysis, Design, Development, Implementation, Evaluation).

Table 3. Brief introduction and description of critical elements of Reflection.

Elements	Elements description
Use reflection as surplus tool for engaging with complex tasks (Bain et al. 1999)	To develop coherent knowledge, Elvira et al. (2017) propose various metacognitive/reflective strategies to engage with complex tasks and concepts. It is reflection that takes a learner from one part of the authentic task to another. Moreover, it is the process that brings de-contextualised knowledge to the next complex situation with a deeper understanding of its origin (Ashford-Rowe, Herrington, and Brown 2014).
Support developing a theoretical perspective from an authentic context (Hramiak, Boulton, and Irwin 2009)	Dewey (1933) stated that the purpose of reflection is to discover connections between cause and effect, in order to gain new understanding. In that respect, reflection can support de-contextualisation by making the learner more aware of their own knowledge and promoting a critical evaluation of the experience. In addition, as noted in Elvira et al. (2017, 192), learners should be guided to 'see the complexity of knowledge' and be instructed to question their ideas.
Reflection follows learning as essential step to move from a concrete to an abstract view (Korkko, Kyro-Ammala, and Turunen 2016)	Reflection should follow learning experience as an essential step. Dewey (1933) pointed out that no experience has meaning without reflection (Kreber 2001). It is the process in which students try to acquire abstract and general understanding from concrete learning experience (Boud, Keogh, and Walker 1985; Larrivee 2000). Additionally, doing so, learners practise a range of cognitive processes such as summarising, analysing, deduction and elaboration (Elvira et al. 2017).
Provide guidance for reflection throughout the learning circle (Leijen et al. 2014)	Guided reflection activities enable students to find the way to structure perception and understanding. Literature indicates that reflective thinking is not necessary happening spontaneously and should almost always be explicitly encouraged (Boud, Cohen, and Walker 1993; Coulson and Harvey 2013). Guided reflection can support learners to understand knowledge and experience during both re- and de-contextualisation processes (Gibbs 1998).
Facilitate reflection both in-action and on-action (Harford and MacRuairc 2008)	Developing a coherent knowledge takes time and requires focusing on a specific sub-component of the learning process in order to witness relations between theory and experience (Elvira et al. 2017). Reflection-in-action (Schön 1983) should follow the learners in their efforts to adapt their thoughts and ways of thinking at the time they emerge into concrete experiential activities. Reflection-on-action (Schön 1983) is the process of examining experience at some distance from the event.
Foster re- and de-contextualisation during reflection on learning activities (Rawlins and Kehrwal 2014)	Reflective learning offers students the opportunity to (1) develop the ability to apply theoretical knowledge in the light of practical situations, (2) create new understanding by gaining experience and converting it into generalisation, and (3) further apply knowledge to create other experiences (Boud, Keogh, and Walker 1985; Tynjälä, Välimaa, and Sarja 2003).
Use reflection to promote learners' self-development and personal growth (Leijen et al. 2014)	Reflection will not only challenge learning experience and developed knowledge, but its influence goes beyond cognition (Dewey 1933). It is a process in which learners identify personal assumptions and question their meaning. Students should be aware of their beliefs and actions as a basis for personal growth and self-development (Gibbs 1998; Ursin and Paloniemi 2019).

The following nine practical guidelines that can be derived from the review study and the mARC model, as we have presented, are intended to assist practitioners in designing more experiential learning.

Table 4. Brief introduction and description of critical elements of Collaboration.

Elements	Elements description
Use a variance of group members' experience to enable students to form a new understanding (Cowan 2012)	Tynjälä, Välimaa, and Sarja (2003) stress that the others persons' experience in a group can be used effectively to promote interdependence and support the development of shared understanding. However, too much variation leads to no learning (Castelijns, Vermeulen, and Kools 2013). Van den Bossche et al. (2011) argue that only if there is a critical stance regarding each other's contributions, ideas and comments there will be construction of a new understanding.
Provide a community of practice as a resource of authentic environment (Hagevik, Aydeniz, and Rowell 2012)	As noted by Sutherland and Markauskaite (2012) engaging learners with a community (Lave and Wenger 1991) can be a mechanism to afford authentic environment for involvement in various aspects of theory and practice. In this context, community can serve as an environment for practising both professional development (Castelijns, Vermeulen, and Kools 2013) and academic skills (Wald and Harland 2017; Weinberger and Fischer 2006).
Allow joint re-evaluation of experience and new knowledge (Chi 2013)	Recognising that there is no one way to answer complex learning tasks is an important element in supporting authentic and reflective practice. Moreover, joint re-evaluation of experience and understanding, according to Lockhorst (2004) can lead to new knowledge.
Promote various perspectives as a resource for deeper reflection (Harford and MacRuairc 2008)	Having different perspectives within a group of learners can be used to expand each other's thoughts and ideas about a topic (Boud, Keogh, and Walker 1985; Coulson and Harvey 2013). Promoting diverse experience as a source of deeper reflection can increase the potential benefits of learning (Herrington and Oliver 2000; Mezirow 1981). Moreover, making students' tactical knowledge explicit within a group of learners evokes development of different metacognitive strategies (Elvira et al. 2017).
Encourage self-awareness within groups during the process of reflection (Wenzlaff and Wieseman 2004).	For Lave and Wenger (1991), the learning process is more than just gaining experience, skills and knowledge. Through the process of collaboration, not only experience and knowledge are explored and deconstructed, but also changes take place beyond cognition. Learners develop their identity in the relationship to a group and expand self-awareness (Ashford-Rowe, Herrington, and Brown 2014), self-esteem, confidence, and intrinsic motivation (Ursin and Paloniemi 2019).
Ignite a debate on learners' conceptions and allow for peer feedback (Swaggerty and Broemmel 2017).	Several authors point out that peer feedback can lead to the improvement of both processes re- and de-contextualisation (Elvira et al. 2017). It's a method to help students to monitor and compare their learning progress, concepts development and understanding. Peer feedback can stimulate a debate (Castelijns, Vermeulen, and Kools 2013), challenge each other's reasoning (Johnson and Johnson 2009), and help students to move through experiential learning.
Engage students within a community of practice in a cohort structure (Seed 2008)	During learning in a cohort structure, learners search for insights and jointly construct new knowledge that ultimately leads to strengthening involvement in complex learning (Castelijns, Vermeulen, and Kools 2013; Tynjälä, Välimaa, and Sarja 2003). Opportunity to have a dialogue is a strategy to develop new knowledge together (Castelijns, Vermeulen, and Kools 2013). Elvira et al. (2017) call that 'inexpressible knowledge' – finding a way within a group to convert procedural knowledge into conceptual knowledge.
Provide different expertise as a resource during learning activities (Cowan 2012)	Tasks that require individuals to work together to achieve goals create what Johnson and Johnson (2009) call 'positive interdependence'. This interdependence becomes even more evident when group members have different

(*Continued*)

Table 4. Continued.

Elements	Elements description
	disciplinary expertise (Noroozi et al. 2013). Although diversity in such interaction leads to new 'abstract or more complex' insights, big difference and variations may hinder learning (Castelijns, Vermeulen, and Kools 2013).
Provide structure and guidance for students' collaborative activities (Cannon and Scharmann 1996)	Guidance of students' collaborative activities is proved to be a promising approach to coordinate various learner processes and promote learning (Weinberger and Fischer 2006). Noroozi et al. (2013) point out, for example, that groups of learners during the collaboration often require special support, such as coordinating joint activities.
Allow students to see, share and express different points of view (Chi 2013)	Learners are more inclined to contribute to the creation of relation capital if there is a culture of openness and trust in which everyone has a voice and is listened to. Castelijns, Vermeulen, and Kools (2013) argued that talking openly with peers about different views, opinions and understanding positively influence learning in group.
Foster collectively shared performance or product (Howard, McClannon, and Wallace 2014)	Members' interdependency is increased by sharing the same goal and responsibilities for accomplishing a task (Scardamalia and Bereiter 2003). Van den Bossche et al. (2011, 284) stressed that 'the essence of collaboration is hereby a process of building and maintaining a shared conception'. These 'conceptual artefacts', as Engeström and Sannino (2010) call them, include the sharing of new knowledge, and also jointly developed outcomes as collectively shared activities and understanding (corresponding to cognitive social capital).

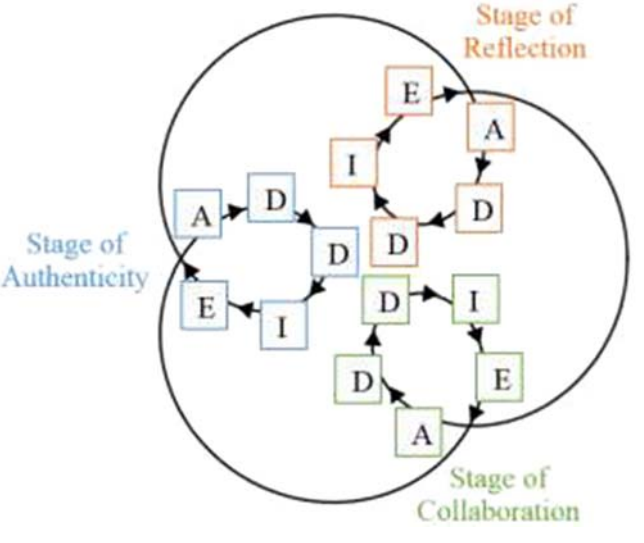

Figure 3 .#Three stages of learning environment redesign cycle according to three pillars of the mARC model (each including phases of the ADDIE framework).

To ensure that the learning environment reflects the complexity of what needs to be learned, with new knowledge emerging from experience and being transforming into understanding, practitioners need to assure that (1) *Students are enabled to appreciate and engage with the real-world context*. This can be achieved, for example, by (2)

Providing students with various viewpoints on the learning process through different learning strategies and methods, or by (3) *Engaging students within a community of practice in a cohort structure.* Furthermore, it may be necessary to ensure that learners have the opportunity to learn from each other's differences by assuring the (4) *Engagement of students in discussing and debating a topic, exchanging ideas, and expressing different points of view*.

We have argued that the learning context is often considered by students as being non-authentic or 'not important'. Therefore, during the learning design process, we have to consider the perception of the learning process itself. According to the model, practitioners should assure (5) *Students using prolonged, structured and guided critical reflection* as an essential step in engaging students with the meaning of the experience. In particular, this guideline is seen as a useful strategy to (6) *Support students in developing a theoretical perspective from an authentic context,* and to further elaborate upon understanding and experience. In addition, we argue that the learning environment has to provide opportunities for both processes of re- and de-contextualisation. In meeting this challenge, it may be necessary to consider (7) *Students using diverse learners' perspectives as resources for critical reflection* and support for the growth of shared understanding within a cohort.

Finally, the last two overarching practical guidelines derived are to (8) *Gradually design a complex structure of the learning environment and redesign it in each subsequent stage of the design process*, including elements from all three pillars of experiential learning (Authenticity, Reflection, Collaboration) in the learning design as (9)*'Fostering elements' of the pillar and 'strengthening elements' in relation to the whole model and all of its components.* By following these guidelines, the mARC model can make an important contribution to strengthening the links between theoretical knowledge and practical experience within learning.

5. Conclusion and discussion

Concrete learning experiences and more abstract thinking are influencing each other through a complex process (Afdal and Kari 2018). Yet, higher education institutions are often criticised for 'failing to embrace experiential learning methods' (Groves et al. 2013, 555). While the literature identifies multiple benefits of experiential learning, designing such an environment and adapting it to the needs of students and to the learning context is complicated. The point of departure for this article was defined by the results from our review study (Radović, Hummel, and Vermeulen 2019), the theory of experiential learning (Coulson and Harvey 2013; Groves et al. 2013; Kolb 1984), and the concepts of authenticity, reflection, and collaboration. Although the model is based on research specifically focused on experiential learning in the domain of the Masters in Educational Sciences, we have studied broad learning theories to further craft the model to enable wider applicability. At the same time, this article contains a number of points for consideration.

First and foremost, the mARC model is introduced as a complementary model to experiential learning model of the Kolb (1984). While the Kolb's model describes the process of transforming experience and knowledge, the mARC model provides a structure that allows an effective experiential learning environment to be developed.

Moreover, the mARC model indicates different instructional elements and how they can be used to strengthen the links between learning and practising (in both directions, from theory to practice and vice versa).

Second, the implication from the model suggests manifold use of critical elements, both locally within each pillar of the model (fostering role), and globally in relation to the model as a whole (strengthening role). Furthermore, this article clearly stressed the important roles of reflective and collaborative learning activities, alongside authentic learning activities. Reflective learning activities are not only seen as an extra layer of complexity, but also necessary to reinforce deeper learning and ties between theory and practice. The role of the critical elements of Collaboration proved to offer a number of advantages, and places experiential learning environments within a social context and in community of practice. All three pillars should be involved during learning design and revising in order to develop complexity and to foster re- and de-contextualisation of knowledge.

Third, we assume that for various learning domains the implementation of the mARC model will vary (different combinations, volumes and implementations of the critical instructional elements). We currently are carrying out and setting up empirical studies to further refine and evaluate the mARC model. We believe that with providing more understanding on the instructional design of experiential learning environments, these could become 'again' (here we refer to the last paragraph in Section 1) a leading educational innovation to foster learning transfer between concrete learning experience and knowledge.

6. Recommendation for further research

Future qualitative and quantitative research studies may examine and evaluate the influence of the critical elements described in the mARC model. We propose educational design research where the context and domain of learning can be controlled during the entire processes of learning design, redesign, and evaluation. Although the mARC model is depicted as a three-step iterative process, this does not mean that after three cycles of iteration the mARC model loses its applicability. To facilitate the pursuit of more experiential learning, it is probably necessary to continue use the model with much more cyclical iterations.

It is recommended that scholars and educators use the mARC model according to the structure we described (in the process we earlier called iterative approach). However, it would be interesting to witness the results of using the mARC model in a more cumulative approach – during just one stage of development. This approach would allow scholars to decide and attribute particular components of the model. We believe that this would be possible since the links between fostering and strengthening elements within the model are clearly highlighted (see Figure 2, and explanations in Section 4). However, the evaluation of particular elements and their impact on the learning process are more complicated to achieve in less controlled settings.

A final recommendation that arose from the article is that too much authentic, reflective and collaborative learning activities might paralyse, and too little might inhibit learners' growth. An important issue for scholars using the mARC model will be in finding the right volume, combination and implementation of these instructional elements in

providing the optimal level of support for learners to gain academic skills and practice knowledge in an authentic context.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

Slaviša Radović http://orcid.org/0000-0001-8840-6053
Hans G. K. Hummel http://orcid.org/0000-0002-3579-749X
Marjan Vermeulen http://orcid.org/0000-0001-8084-7217

References

Afdal, H. W., and S. Kari. 2018. "Designing and Redesigning Research-Based Teacher Education." *Teaching and Teacher Education* 74: 215–228.
Aiken, I. P., and B. D. Day. 1999. "Early Field Experiences in Pre-Service Teacher Education: Research and Student Perspectives." *Action in Teacher Education* 21 (3): 7–12.
Ashford-Rowe, K., J. Herrington, and C. Brown. 2014. "Establishing the Critical Elements That Determine Authentic Assessment." *Assessment and Evaluation in Higher Education* 39 (2): 205–222.
Bain, J., C. Mills, R. Ballantyne, and J. Packer. 1999. "Using Journal Writing to Enhance Student Teachers' Reflectivity During Field Experience Placements." *Teachers and Teaching: Theory and Practice* 5: 51–73.
Beard, C. 2008. "Experiential Learning: The Development of a Pedagogic Framework for Effective Practice." PhD diss., Sheffield Hallam University.
Bergsteiner, H., and G. C. Avery. 2014. "The Twin-Cycle Experiential Learning Model: Reconceptualising Kolb's Theory." *Studies in Continuing Education* 36 (3): 257–274.
Boud, D., R. Cohen, and D. Walker. 1993. "Understanding Learning from Experience." In *Using Experience for Learning*, edited by D. Boud, R. Cohen, and D. Walker, l–17. Buckingham, UK: SRHE and Open University Press.
Boud, D., R. Keogh, and D. Walker. 1985. "Promoting Reflection in Learning: A Model." In *Reflection: Turning Experience into Learning*, edited by D. Boud, R. Keogh, and D. Walker, 18–40. London, UK: Kogan Page.
Buschor, C. B., and E. Kamm. 2015. "Supporting Student Teachers' Reflective Attitude and Research-Oriented Stance." *Educational Research for Policy and Practice* 14 (3): 231–245.
Cannon, J., and L. Scharmann. 1996. "Influence of a Cooperative Early Field Experience on Preservice Elementary Teachers' Science Self-Efficacy." *Science Education* 80 (4): 19–436.
Castelijns, J., M. Vermeulen, and Q. Kools. 2013. "Collective Learning in Primary Schools and Teacher Education Institutes." *Journal of Educational Change* 14 (3): 373–402.
Celik, S. 2012. "Effect of Implementing Authentic Tasks in Teacher Education." *Cypriot Journal of Educational Sciences* 7 (3): 208–219.
Chi, F. 2013. "Turning Experiences into Critical Reflections: Examples from Taiwanese In-Service Teachers." *Asia-Pacific Journal of Teacher Education* 41 (1): 28–40.
Coulson, D., and M. Harvey. 2013. "Scaffolding Student Reflection for Experience-Based Learning: A Framework." *Teaching in Higher Education* 18 (4): 401–413.
Cowan, J. 2012. "Strategies for Developing a Community of Practice: Nine Years of Lessons Learned in a Hybrid Technology Education Master's Program." *TechTrends* 56 (1): 12–18.
Dewey, J. 1933. *How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process*. Chicago, IL: Henry Regnery.

Elvira, Q., J. Imants, B. Dankbaar, and M. Segers. 2017. "Designing Education for Professional Expertise Development." *Scandinavian Journal of Educational Research* 61 (2): 187–204.
Engeström, Y., and A. Sannino. 2010. "Studies of Expansive Learning: Foundations, Findings and Future Challenges." *Educational Research Review* 5 (1): 1–24.
Gibbs, G. 1998. *Learning by Doing a Guide to Teaching and Learning Methods*. Oxford: Oxford Brooks University.
Groves, M., K. Leflay, J. Smith, B. Bowd, and A. Barber. 2013. "Encouraging the Development of Higher-Level Study Skills Using an Experiential Learning Framework." *Teaching in Higher Education* 18 (5): 545–556.
Gulikers, J. T. M., L. Kester, P. A. Kirschner, and T. J. Bastiaens. 2008. "The Effect of Practical Experience on Perceptions of Assessment Authenticity, Study Approach, and Learning Outcome." *Learning and Instruction* 18: 172–186.
Gustafson, K., and R. M. Branch. 2002. *Survey of Instructional Development Models*. 4th ed. Syracuse, NY: ERIC Clearinghouse on Information & Technology.
Hagevik, R., M. Aydeniz, and C. Rowell. 2012. "Using Action Research in Middle Level Teacher Education to Evaluate and Deepen Reflective Practice." *Teaching and Teacher Education* 28: 675–684.
Harford, J., and G. MacRuairc. 2008. "Engaging Student Teachers in Meaningful Reflective Practice." *Teaching and Teacher Education* 24 (7): 1884–1892.
Herrington, J., and L. Kervin. 2007. "Authentic Learning Supported by Technology: 10 Suggestions and Cases of Integration in Classrooms." *Educational Media International* 44 (3): 219–236.
Herrington, J., and R. Oliver. 2000. "An Instructional Design Framework for Authentic Learning Environments." *Educational Technology Research and Development* 48 (3): 23–48.
Holman, D., K. Pavlica, and R. Thorpe. 1997. "Rethinking Kolb's Theory of Experiential Learning: The Contribution of Social Constructivism and Activity Theory." *Management Learning* 28: 135–148.
Howard, B., T. McClannon, and P. Wallace. 2014. "Collaboration Through Role Play Among Graduate Students in Educational Leadership in Distance Learning." *American Journal of Distance Education* 28 (1): 51–61.
Hramiak, A., H. Boulton, and B. Irwin. 2009. "Trainee Teachers' Use of Blogs as Private Reflections for Professional Development." *Learning, Media and Technology* 34 (3): 259–269.
Johnson, D. W., and R. T. Johnson. 2009. "An Educational Psychology Success Story: Social Interdependence Theory and Cooperative Learning." *Educational Researcher* 38 (5): 365–379.
Kelly, C. 1997. "David Kolb: The Theory of Experiential Learning and ESL." *The Internet TESL Journal* 3 (9): 1–5.
Kolb, D. A. 1984. *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, NJ: Prentice-Hall.
Kolb, D. A. 2015. *Experiential Learning: Experience as the Source of Learning and Development*. Upper Saddle River, NJ: Pearson Education.
Korkko, M., O. Kyro-Ammala, and T. Turunen. 2016. "Professional Development Through Reflection in Teacher Education." *Teaching and Teacher Education* 55: 198–206.
Kreber, C. 2001. "Learning Experientially Through Case Studies? A Conceptual Analysis." *Teaching in Higher Education* 6 (2): 217–228.
Larrivee, B. 2000. "Transforming Teaching Practice: Becoming the Critically Reflective Teacher." *Reflective Practice* 1 (3): 293–307.
Lave, J., and E. Wenger. 1991. *Situated Learning Legitimate Peripheral Participation*. Cambridge: Cambridge University Press.
Lee, J., and S. Jang. 2014. "A Methodological Framework for Instructional Design Model Development: Critical Dimensions and Synthesized Procedures." *Educational Technology Research and Development* 62 (6): 743–765.
Leijen, Ä, R. Allas, A. Toom, J. Husu, J. J. M. Marcos, P. Meijer, D. Knezic, M. Pedaste, and E. Krull. 2014. "Guided Reflection for Supporting the Development of Student Teachers' Practical Knowledge." *Procedia – Social and Behavioural Sciences* 112: 314–322.

Lindsey, L., and N. Berger. 2009. "Experiential Approach to Instruction." In *Instructional-Design Theories and Models: Building a Common Knowledge Base Volume III*, edited by C. M. Reigeluth and A. A. CarrChellman, 117–142. New York: Taylor and Francis.
Lockhorst, D. 2004. "Design Principles for a CSCL Environment in Teacher Training." PhD diss., Utrecht University, Utrecht.
Matsuo, M. 2015. "A Framework for Facilitating Experiential Learning." *Human Resource Development Review* 14 (4): 442–461.
Mezirow, J. 1981. "A Critical Theory of Adult Learning and Education." *Adult Education* 32 (1): 3–24.
Noroozi, O., S. D. Teasley, H. J. A. Biemans, A. Weinberger, and M. Mulder. 2013. "Facilitating Learning in Multidisciplinary Groups with Transactive CSCL Scripts." *International Journal of Computer-Supported Collaborative Learning* 8 (2): 189–223.
OECD. 2018. *Education at a Glance 2018: OECD Indicators*. Paris: OECD Publishing.
OECD. 2019. *Envisioning the Future of Education and Jobs: Trends, Data and Drawing*. Paris: OECD Publishing.
Petticrew, M., and H. Roberts. 2006. *Systematic Reviews in the Social Sciences: A Practical Guide*. Malden, USA: Blackwell Publishing.
Race, P. 2014. *Making Learning Happen*. 3rd ed. London: Sage.
Radović, S., H. G. K. Hummel, and M. Vermeulen. 2019. "The Challenge of 'More' Experiential Learning in Master of Education: Systematic Literature Review." Submitted.
Rawlins, P., and B. Kehrwal. 2014. "Integrating Educational Technologies into Teacher Education: A Case Study." *Innovations in Education and Teaching International* 51 (2): 207–217.
Roberts, J. 2018. "From the Editor: The Possibilities and Limitations of Experiential Learning Research in Higher Education." *Journal of Experiential Education* 41 (1): 3–7.
Scardamalia, M., and C. Bereiter. 2003. "Knowledge Building Environments: Extending the Limits of the Possible in Education and Knowledge Work." In *Encyclopedia of Distributed Learning*, edited by A. DiStefano, K. E. Rudestam, and R. Silverman, 269–272. Thousand Oaks, CA: Sage Publications.
Schön, D. A. 1983. *The Reflective Practitioner*. New York: Basic Books.
Seed, A. H. 2008. "Cohort Building Through Experiential Learning." *Journal of Experiential Education* 31 (2): 209–224.
Slavich, G. M., and P. G. Zimbardo. 2012. "Transformational Teaching: Theoretical Underpinnings, Basic Principles, and Core Methods." *Educational Psychology Review* 24: 569–608.
Sutherland, L., and L. Markauskaite. 2012. "Examining the Role of Authenticity in Supporting the Development of Professional Identity: An Example from Teacher Education." *Higher Education* 64 (6): 747–766.
Swaggerty, E. A., and A. D. Broemmel. 2017. "Authenticity, Relevance, and Connectedness: Graduate Students' Learning Preferences and Experiences in an Online Reading Education Course." *Internet and Higher Education* 32: 80–86.
Teräs, H. 2016. "Collaborative Online Professional Development for Teachers in Higher Education." *Professional Development in Education* 42 (2): 258–275.
Tynjälä, P., J. Välimaa, and A. Sarja. 2003. "Pedagogical Perspectives on the Relationships Between Higher Education and Working Life." *Higher Education* 46 (2): 147–166.
Ursin, J., and S. Paloniemi. 2019. "Conceptions of Teachership in the Professional Identity Construction of Adult Educator Graduates." *Teacher Development* 23 (2): 233–248.
Van den Bossche, P., W. Gijselaars, M. Segers, G. Woltjer, and P. Kirschner. 2011. "Team Learning: Building Shared Mental Models." *Instructional Science* 39: 283–301.
Villarroel, V., D. Boud, S. Bloxham, D. Bruna, and C. Bruna. 2019. "Using Principles of Authentic Assessment to Redesign Written Examinations and Tests." *Innovations in Education and Teaching International*, doi:10.1080/14703297.2018.1564882.
Wald, N., and T. Harland. 2017. "A Framework for Authenticity in Designing a Research-Based Curriculum." *Teaching in Higher Education* 22 (7): 751–765.

Weinberger, A., and F. Fischer. 2006. "A Framework to Analyze Argumentative Knowledge Construction in Computer-Supported Collaborative Learning." *Computers & Education* 46 (1): 71–95.

Wenzlaff, T. L., and K. C. Wieseman. 2004. "Teachers Need Teachers to Grow." *Teacher Education Quarterly* 31 (2): 113–124.