Connecting theory and practice: reviewing six learning theories to inform online instruction

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Abstract

Purpose – The purpose of this paper is to analyze six learning theories, beyond those presented in an earlier article by the authors, and discuss their relevance and application in online instruction.

Design/methodology/approach – The following databases were used to review the literature on adult learning theories: Academic Search Premier, ERIC and ProQuest. The following key search terms were used in the search process: online instruction, cognitivism, connectivism, heutagogy, social learning theory, transformative learning theory and Vygotsky’s zone of proximal development. The titles of the identified articles were first reviewed for relevance, followed by the abstract, before any further review for suitability for inclusion in this article.

Findings – The theory comparison revealed that it is critical to ascertain which learning theory best matches an instructional situation and the background of the learners. The selected learning theories differ in several parameters. The theories were critiqued for their contributions to identified elements in promoting learning. The discussed theories suggest ways to improve online learning environments.

Research limitations/implications – Many adult perspectives about learning, while called theories, are largely lacking in evidence leading to them becoming theories. Thus, there remains a need for empirical evidence of these theories and their roles in online instruction. Comparisons of the application of these theories for adult learners in online instruction would also be useful in establishing the effectiveness of the various learning theories in different adult learning situations.

Practical implications – This paper provides a theoretical lens for adult instructors and instructional designers in incorporating these adult learning theories appropriately in improving online instruction.

Originality/value – This literature review uniquely critiques and compares common adult theories as they apply to adult online instruction.

Keywords Heutagogy, Social learning, Behaviourism, Cognitivism, Connectivism, Online instruction, Transformative learning theory

Paper type Conceptual paper

Learner engagement is crucial in online learning (Arghode and Wang, 2016; Ellis and Bliuc, 2019). Adult learners do not fully participate in online discussions for many reasons (Baran et al., 2011; Ke, 2010; Song et al., 2004). Learners are unlikely to participate fully when instructors are not entirely engaged and committed to improving learner engagement...
Therefore, it can be beneficial for adult learners if online instructions clearly communicate their purposes, student expectations and how the online course design was informed from the course’s intended learning outcomes. The implementation of an instructor’s vision is equally important and must be actively and attentively furthered for the duration of the course. Learner engagement improves when faculty share their interests (Song et al., 2004). Similarly, adult learner understanding can be improved through faculty members’ effective utilization of adult learning principles (Arghode et al., 2017).

Adult learners often approach learning from their backgrounds and experiences, which creates an opportunity for critical group reflection. Group reflection is often an important aspect of adult learning that links to the adult learning theories discussed here. Online instruction created for the adult learner elicits the best academic performance when it provides opportunities for learners to exchange their experiences related to both cognitive and affective domains. This includes life experiences that connect with cognitive aspects of the content in the instruction. It is important to give the adult learner opportunities to share the importance of their beliefs, attitudes and values pertaining to the particular situation or phenomenon in the instruction (Abraham and Komattil, 2017; Krathwohl et al., 1973).

Adult learners often prefer to take responsibility for the learning, are usually self-directed, need information that can be immediately applicable to their professional situation and generally prefer practical knowledge that will improve their skills to help facilitate their work and boost their confidence. Finally, adult learners can be resistant to change and resist the idea that additional learning or training is even necessary. This article explores the importance for educators and trainers to consider and use learning theories that work in concert with adult learner traits and preferences.

Adults taking online courses introduce new dynamics to the course experience. Adult learners approach instruction with high expectations. Considering instructors’ pivotal role in online learning, in a previous article (Arghode et al., 2017), we explored four commonly accepted adult learning theories (Boling et al., 2012; Schutt et al., 2009) and described how they might be used to impact online learning for adults. That article, however, limited the number of theories explored. In this article, we add to that article by exploring six more commonly referenced adult learning theories. As we indicated in that article, while referred to as theories, many of these are not theories, in a technical sense, but are simply concepts about how some people perceive adults learn.

The underlying purpose of both articles is to improve online instruction. Such improvement, given the growth in online learning and increasing interest in exploring learner characteristics and their influence on learning (Abdelaziz, 2013; Salimi and Kornelus, 2018), is imperative and timely. At the same time, human resource development (HRD) will benefit from the integration of adult learning theory principles in designing online instruction. Instructors often use a learning theory, either consciously or unconsciously, to design and implement online instruction for adults without much consideration to students’ inclinations and skills to participate in online learning (Schommer-Aikins and Easter, 2018). While much of the research regarding learner motivation has been conducted in the classrooms of children and youth, there have been limited studies highlighting the role of adult learning theories and their applications in the online modality (Arghode et al., 2017; Chakraborty and Muyia Nafukho, 2014). Even though there are studies discussing online instruction (Lowenthal et al., 2018; Pickett, 2019), and there are also studies exploring learning theories, very few studies have focused on connecting the learning theory principles to online learning. Our aim is to provide a discussion on the relevance and applicability of adult learning theories in online instruction. In this article, we describe six popular learning theories, e.g. cognitivism, connectivism, heutagogy, social learning,
transformative learning theories and Vygotsky’s zone of proximal development (ZPD), and their implications for online instruction. Although cognitivism was included earlier, we are discussing the theory again in conjunction with our other selected learning theories to present an improved analysis. The theories were selected because of their relevance and applicability in improving online instruction. For example, cognitivists believe in making the learning process structured to be easier for learners. Instructors who accept this approach design their instruction to promote better connections with prior learning. Those who embrace social learning theory stress the building of a learning community by focusing on the needs of and benefits for learners through joint participation in the learning process. Heutagogy, transformative learning and Vygotsky’s theory stress the need to elevate the current state to achieve desirable states, whereas connectivism focuses on enabling learners to build associations with prior learning besides stressing on the need to select meaningful information. There are connections and overlapping themes among these selected learning theories. Between these two articles, while there are other learning theories, we cover the major theories affecting adult learning in an online learning environment. The purpose of this article, then, is to compare six learning theories and suggest their relevance to adults learning online.

Methods
We used the following databases to review the literature on adult learning theories: Academic Search Premier, ERIC and ProQuest. The following key search terms were used in our search: online instruction, cognitivism, connectivism, heutagogy, social learning theory, transformative learning theory and Vygotsky’s ZPD. The title of identified articles was first reviewed for relevance, followed by the abstract, before further review for suitability for inclusion in this article.

The literature review process included:
- exploring and choosing articles;
- summarizing the articles; and
- extracting relevant information from the summaries.

In selecting the central and seminal works, we used the following criteria:
- studies cited in the selected articles between 2007 and 2017; and
- the relevance of the articles to the theoretical framework and to the theories under study.

Although we restricted our selection to the past 10 years, relevant prior studies considered to be classic were also selected. In the following section, we review and reflect on the selected learning theories.

Theoretical framework
Keller (1987) proposed the ARCS (attention, relevance, confidence, satisfaction) model of motivation that is relevant for designing online instruction to engage adult learners. The model can be helpful in designing engaging instructional materials (Donovan, 2015). The ARCS model can be used with any learning theory and traditional instructional design models to improve learner motivation and learning outcomes. Similar to Gagne’s Nine Events of Instruction (Gagne and Briggs, 1974), the model starts with gaining learners’ attention (Anderson, 2008), which can be a non-graded introduction activity with a small-stakes approach to learner engagement. The next step involves informing the learner of the instructional relevance or online learning objective. Online strategies could include thorough
instructions that inform learners how the learning object or lesson is necessary in meeting the learning objective. This is especially important when designing for adult learners to help them understand how learning activities connect with real-life scenarios in the workplace. Hence, learning activities can then be connected to real-life situations (Anderson, 2008; Arghode and Wang, 2016; Donovan, 2015). Third, subject matter experts and instructors should design for success by creating thorough self-assessment, scaffolding and incorporating overall expectations for learners, besides making conscious efforts to understand and address the barriers involved in designing online learning (Anderson, 2008; Jokiaho et al., 2018; Mishra, 2002). Finally, effective and timely feedback on learner performance can promote satisfaction in the form of feedback on graded learner work, apart from using creative and novel ways to enhance engagement (Pickett, 2019).

Subject matter experts and online instructors should create online multimedia in multiple formats (Cetina et al., 2018; Rajadurai et al., 2018). Information presented in both a textual-visual and auditory format have the potential to promote more effective processing as opposed to a single format (Schommer-Aikins and Easter, 2018). Paivio (1990) developed dual coding theory based on the idea that the formation of mental images aids the learning process. Dual coding theory assumes that there are two cognitive subsystems, one specialized for the representation and processing of nonverbal events through imagery and the other specialized for dealing with language. Therefore, custom multimedia learning objects created for a specific instructional situation should have visuals and auditory that complement, not duplicate, each other. Specifically, appropriate non-text visuals should match a descriptive narrative rather than simple text-based slides or text-based images that relay the same content as the narrative. Moreover, some students are better equipped or skilled to use the online learning modality (Cetina et al., 2018).

Although adult learners are often attracted to the flexibility offered by asynchronous online learning, research (Kara et al., 2019) has revealed that adult learners can face challenges related to internal and external factors, such as their age, gender, knowledge and skills. Adults compose the largest portion of the online population in education (Kara et al., 2019; Ke and Xie, 2009; Lim, 2001). Educators should plan for challenges, such as time management; balance between academic program and work/family life; and learning new technologies and skills (Kara et al., 2019). External student challenges can include changes in employment or family life (Kara et al., 2019). Finally, program-related challenges can often exist through changes to the academic program or institution, or limited student resources (Kara et al., 2019). Online instruction is best if it is designed to meet as diverse a learning population as possible and include as many resources and instructions as possible for the adult learner.

Learning theories
The following sections present the six selected learning theories for this article and their relevance to online learning for adults.

Cognitivism
Cognitivism is a relatively recent learning theory that evolved in the second half of the twentieth century. The early works of Tolman (1948), Piaget (1964), Gagné (1970), Vygotsky (1978) and Bruner (1973) created a shift away from behaviorism to cognitivism in explaining the psychology behind learning as a cognitive process. Tolman’s (1948) research on the motivation of maze-running rats is often viewed as the precursor to contemporary cognitivism (Greenwood, 1999). To cognitivists, learning is an internal process that involves memory, thinking, reflection, abstraction and motivation (Ally, 2004). Information is often chunked or streamlined to reduce the cognitive load of the learner.
According to Piaget (1964), learning is a biological act in which one adapts to the environment. The structure of online instruction can be aligned with the tenets of cognitivism. While the behaviorist looks for eliciting certain behaviors in the learner, the cognitivist strives to streamline learning for the working memory. Ertmer and Newby (1993) submitted that the cognitive approach emphasizes making knowledge meaningful to help learners organize and relate new information with prior knowledge.

West et al. (2013) defined three types of cognitive load. Intrinsic load is the number of elements that are processed in the working memory. Reading a children’s story is analogous to a biology text as an example of intrinsic load. Learning from a biology text will likely present a higher intrinsic load than a children’s book. This is especially relevant when designing online instruction as online learning is intended for self-directed learner, and thus instructional design should present a lower cognitive load without compromising on the content. West et al. (2013) also pointed out that there is an extraneous load associated with the mental resources required for the learning process. A higher extraneous load results when the learner has to use more working memory than ideal to find information or understand what the learner needs to do as part of the learning process. Online course designers and subject matter experts should design instruction for extraneous load by keeping learner information and instructions concise, clear and understandable. West et al. (2013) highlighted the importance of germane load, which is the working memory necessary to create new or activate existing schemas to learn. Increasing germane load may increase learner efficiency. It is important to reduce extraneous cognitive load for online learner.

Prior knowledge acts as a mediating construct that changes the dynamics of cognitivism. The extent to which the learner has gained prior knowledge about a subject changes the nature of the stimuli and course activities (Arghode et al., 2018; Chakraborty and Muyia Nafukho, 2014; West et al., 2013). Online course activities can use strong stimuli based on prior knowledge in an upper level graduate course or minimum stimuli in a lower level course in which learners are in the discovery phase.

Connectivism

As access to education increases through online learning and massive open online courses (MOOCs), a new learning theory has begun to emerge (Jepchumba and Gaceri, 2013; Kop and Hill, 2008; Siemens, 2005). In connectivism, learning occurs when knowledge is actuated through the process of learners connecting to the prior knowledge and feeding information into a learning community (Kop and Hill, 2008). Learning and knowledge happen through diversity of opinion. Learning is a process of acquiring knowledge through nurturing diverse connections to a network and identifying what to learn in an ever-shifting reality (Bell, 2011). Connections to a network provide direct access for learners to share information and critique or discard information that is perceived to be inaccurate. The learners’ abilities collectively to share knowledge and build a learning network is aptly highlighted in the research (Zhang et al., 2018). Access to technology and the internet has increased the likelihood of large-scale learning communities in higher education. Social networking sites are nodes on the network that provide an environment for exchange of ideas and learning (Kropf, 2013).

According to connectivism, knowledge is distributed across an information network of nodes and can be stored in a variety of digital formats. As information constantly changes, in form, across the network, one’s understanding of the information also changes. Siemens (2005) categorized learning theory into three “epistemological frameworks” (p. 9), namely, objectivism, pragmatism and interpretivism. This framework provides a better understanding of what sets connectivism apart from other learning theories. Kop and Hill (2008) explained that, in objectivism, “reality is external to the mind, and knowledge and perception are
experientially acquired” (p. 5); in pragmatism, “knowledge is a negotiation between reflection and experience, inquiry and action,” whereas interpretivism posits out that “knowledge is an internal construction and is informed through socialization and cultural cues” (p. 5).

Siemens (2005) highlighted Downes’ theory of distributed knowledge as a basis for connectivism. Siemens added connectivism as a fourth framework, explaining “knowledge [is] composed of connections and networked entities [. . .]. The concept of emergent, connected, and adaptive knowledge provides the epistemological framework for connectivism as a learning theory” (p. 10). However, connectivism’s critics respond with resistance to the idea that connectivism belongs among other learning theories. Bell (2011) regarded connectivism as an instructional theory rather than a learning theory:

[…] connectivism alone is insufficient to inform learning and its support by technology is an internetworked world […] connectivism is perceived as relevant by its practitioners but as lacking in rigor by its critics (p. 98).

The author argued that connectivism is an actor-network theory placed at the curriculum level. However, Bell (2011) stated, in the modern instructional context, connectivism is an approach that holds value: “Connectivism exists as an influential phenomenon that inspires instructors and learners to make changes in their practice” (p. 112).

Course design activities and structures that align with connectivism must also be considered (Abdelaziz, 2013). Aksal et al. (2013) conducted action research with 35 interns who participated in one semester. Facebook was used to activate meaningful dialogue among the learners. Self-reports from participants indicated that almost all were satisfied using social media throughout the semester; found it to be an effective way of staying connected with their peers; and believed that it had a significant impact on awareness, reflection and leadership. Nevertheless, there is no evidence that such an approach is more effective than would be the case using other learning theories.

**Heutagogy**
Heutagogy is a recent approach to learning and instruction in which learners are active participants in the learning process and not just passive recipients. The age-old sage-on-stage approach is replaced by having belief in learners’ abilities actively to make efforts to improve their own learning. The focus is on improving both learning and ability to learn. Personal experiences play a vital role in improving learning (Hase and Kenyon, 2007). The instructor’s role is passive, serving rather as a course designer, resource provider, path creator and monitor, whereas learners own their learning and have improved flexibility to tailor its design to suit appropriately their needs, pace, interest and skill. The idea is to prepare and equip learners with the skills to become independent learners and develop the capacity and penchant for learning (Blaschke, 2012; Hase and Kenyon, 2007). An online learning environment offers opportunities to instructors to adopt flexible instructional approaches and enable learners to gain control of the learning process (Abraham and Komattil, 2017; Little and Knihova, 2014; Mulrennan, 2018). As a result, instructional designers and instructors have an opportunity to design online instruction allowing adult learners to ascertain the skills and learning they need to meet the learning outcomes of the course. This can be done through offering discussions in which adult students reflect on their needs and progress or through journaling directly with the instructor.

**Social learning theory**
Social learning theory emphasizes social interactions as a basis of learning. According to theorists, developing trust, exchanging and building on ideas through interactions,
evaluation of past beliefs, acquisition of cultural characteristics, observation and response to social environment are the mechanisms through which learners imbibe learning (Brunstein et al., 2015; Slootweg et al., 2013; Wang et al., 2015). Hall and Hall (2010) stressed that a person’s behavior is not only shaped by, but also shapes, the social environment. Similar to social facilitation theory (Sanders, 1981), in social learning theory, an individual’s dominant response improves because of the presence of others (Hill et al., 2009; Kranke et al., 2015). However, researchers caution that personality factors play a big role in social learning, thereby affecting an individual’s learning capability and inclination (Heller and Mohlin, 2018; von Schönfeld et al., 2019).

Social learning theory is strikingly different from other learning theories because of its reliance on the interactions between individuals/learners in shaping learning. The ongoing interactions constantly shape and design learning, which also results in not only knowledge sharing, but also its creation (Brunstein et al., 2015; Slootweg et al., 2013). Sulsky and Kline (2007) stressed the importance of social learning theory in not only improving trainee skill, but also understanding their motivation, thereby leading to better training design (Sulsky and Kline, 2007). Social learning theorists believe humans imitate, improve and learn with varying capacity and inclination (Tehrani and Riede, 2008). Moreover, humans learn through social interactions building on prior knowledge and the knowledge provided by others. The theorists also believe that providing venues for learners to interact freely can enable improved learning (Holbert and Wilensky, 2019). Social learning theorists accord high importance to learning through social interactions.

Adult learners often prefer to work through real-world problems that pertain to them. In online learning for adults, educators should design instruction that offers adult learners the opportunity for group reflection so that they can see other perspectives of the problem. It is especially useful to promote adult learner intrinsic motivation by designing discussion activities in a professional context. This approach has the potential to elicit the best academic performance from adult learners. An example is using professional current events as discussion activities tied to weekly learning objectives. Adult learners have the potential for deep learning by discussing what is happening in their profession as a teacher, accountant, nurse, manager, therapist, human resource professional, attorney or other professions.

**Transformative learning theory**

Inherent to transformation is the notion of change (Christie et al., 2015). Learning involves improvement in knowledge, skills, ability and attitudes. Transformative learning enables learners to challenge the status quo, aspire for something better and bring behavioral change (Din and Ahmed, 2017). The theory espouses that improved learning results in better community (Christie et al., 2015). Transformative learning encourages learners to be inquirers, examiners and challengers (Casebeer and Mann, 2017), while believing that only through continuous improvement can a learner learn. Thus, learning is not a destination but a never-ending quest for knowledge, skills and the shaping of attitudes and beliefs. According to transformative learning theory, learners need to assess, question and sometimes even disregard their own beliefs in search of knowledge (Casebeer and Mann, 2017; Chu et al., 2012; Madsen et al., 2014). Theorists acknowledge that, sometimes, it is difficult for learners to step away from their comfort zones. Being disturbed by the status quo and willingness to accept the challenges for the sake of betterment is, however, essential to achieve learning (Jepchumba and Gaceri, 2013; Strange and Gibson, 2017; Yelich Biniecki and Conceição, 2016).

Transformative learning theory stresses learner needs and abilities to design instruction in a manner that promotes effective learning (Din and Ahmed, 2017).
learning focuses on increasing interactions among learners and between instructors and learners. The relationship between practice-based theory and transformative learning is reciprocal (Christie et al., 2015). In transformative learning, the focus is on experiential learning to enable learners to achieve a higher learning state. Transformative learning encourages learners to evaluate and critically examine their learning so the distinction between the former and final learning states is evident. The theory also promotes greater application and transferability (Christie et al., 2015). Nevertheless, some theorists critique transformative learning theory for ignoring adult learning principles (Madsen et al., 2014). Sprow Forte and Blouin (2016) extended transformative learning theory’s application to adult learning contexts, including professional development, with a holistic perspective for overall development (Izmirli and Yurdakul, 2014). Chu et al. (2012) extended the theory to distance education and online learning. Interactive learning works well in the online arena. Educators can introduce online group assignments that challenge adult beliefs or initial understanding and monitor and reflect on their progress or shifting beliefs and learning to mark overall change (Yarbrough, 2018). Adult learners can work as a group. Educators can use discussion boards, blogs, wikis and cloud-based social sites as channels for communication within the group of adult learners.

Vygotsky’s zone of proximal development
Vygotsky’s theory emphasizes the gap between a learner’s potential and the actual learning state. Strauss (1993), building on Vygotsky’s framework, mentioned that “learning in social interactions among individuals happens in the zone of proximal development” (p. 198). Weibell (2011) highlighted:

[…] while Vygotsky’s ideas focused on social and cultural interactions as cognitive change catalysts, his theory emphasized internalization of knowledge as both [are] spurred on through social interaction and individually mediated (p. 136).

Vygotsky’s theory focuses on individual effort and external assistance from instructors. Strauss (1993) supported Vygotsky’s theory: “what is learned in concert with others comes to be internalized, and what is learned becomes the new actual knowledge or the new developmental level” (p. 198). Vygotsky urged instructors to focus on learners’ future development, also stressing that instructors must encourage independent learning (Moll, 1990). Instructors play a crucial role in fostering learning through social mediation.

Vygotsky’s ZPD theory espouses facilitated learning and, therefore, can be achieved by external interventions, such as instruction. According to Vygotsky’s ZPD, learning is not solely a personal endeavor because learning involves guidance, help and direction from someone who is more knowledgeable, skilled and experienced. In the following discussion section, we present a synthesis and reflection on these selected learning theories.

Linked to Vygotsky’s ZPD theory is social development theory that supports active learning directed by the learner. In the online arena, instead of restating theories and general course content, instructors and designers can use online media or other cognitive materials to drive deeper understanding through directed and active learning (Yarbrough, 2018).

We adopted the framework from Arghode et al. (2017) to present the six theories described in this article using two parameters:

1. learners’ dependence level (dependent vs independent); and
2. domain of learning (cognitive vs affective).

Figure 1 shows how the theories compare. Vygotsky’s ZPD supports an independent learner more than a dependent learner and is geared almost equally to the cognitive and affective domains.
Vygotsky’s ZPD (Figure 2) also focuses more on social learning and requires self-awareness more when compared to cognitivism, thus placing it more toward the affective than the cognitive domain.

Cognitivism, on the other hand, is placed in the third quadrant and leans more toward a dependent learner and more on the cognitive than affective domain. None of the described theories can be placed in the fourth quadrant, which is more about dependent learners in an affective domain.

Figure 2 depicts social learning and transformative learning in the first quadrant because of their focus on more self-awareness and social learning as opposed to individual learning. In the second quadrant, we have Vygotsky’s ZPD which focuses between less and more self-awareness and lean more toward social than individual learning. Connectivism also shares the quadrant with Vygotsky’s ZPD but leans more than ZPD toward individual learning. Cognitivism which focuses on individual learning but is balanced between less and more self-awareness is placed in the third quadrant. In the fourth quadrant, we have heutagogy which espouses more self-awareness and is almost balanced equally between social and individual learning.

On a continuum, Vygotsky’s ZPD, connectivism, social learning, heutagogy and transformative learning promote learner independence, whereas cognitivism is at the other
Heutagogy and connectivism emphasize the importance of knowledge generation and the role of learners as knowledge creators and not merely knowledge hoarders. Vygotsky’s ZPD and transformative learning highlight how the current learning state differs from the potential learning state and focus on achieving a transformation in learner state. All other theories, viz., cognitivism, connectivism, heutagogy and social learning focus on elevating learner state without considering the gap. Nevertheless, the theories and concepts are unable to specify an individual’s potential learning state and the way to reach it.

The selected learning theories differ on the selected parameters. Connectivism holds that learning perspective learning and knowledge can be developed through nurturing diverse connections to networks (Bell, 2011). It also promotes diversity in thinking to generate knowledge. The focus of learning is in the cognitive and affective domains, and the learning aims at developing rapid connection to networks for relevant knowledge acquisition. Instructors broaden learning by establishing connections to neural networks (Kop and Hill, 2008; Kropf, 2013). Self-directed learning and andragogy align closely with connectivism principles (Siemens, 2005).

Similar to connectivism, cognitivism focuses on learning as a cognitive process in which structure, storage and retrieval improve learning and focus on the cognitive domain. Cognitivists focus on relating new learning to prior knowledge, thus facilitating learning by designing content sensitive to cognitive load. Connectivism, cognitivism and heutagogy share some similarities, such as operating in the cognitive domain and within adult learning principles. As opposed to connectivism and cognitivism, which focus on active involvement of the instructors, heutagogy espouses the belief that instructors should be facilitators and supporters instead of active knowledge disseminators. Social learning theory is similar to heutagogy as it focuses on overall learner development and wants instructors to be facilitators; it even shares the same focus of learning in the cognitive and affective domain. However, social learning differs on the learning perspective from the other theories as social learning theory stresses on social connection, interaction and presence to improve learning. Compared to the four theories discussed above, transformative learning and Vygotsky’s ZPD stress on the need for change. Both theories operate in cognitive domain and stress on bridging the gap between the learners’ actual and potential state. Instructors’ role in both cases is important and experiential learning is an essential component. Tables I and II present details on the learning theories.

The theories discussed in this paper also differed in their core beliefs, implications for online learning and weaknesses. Cognitivism espouses the belief that learning is a process of interpreting and constructing meaning from understanding; connectivism focuses on the connections to a network that can provide access for learners to share information as well as critique or discard inaccurate information. Heutagogy believes learners can take onus of their learning and instructors act as facilitators, whereas social learning focuses on social interactions to promote learning. The two remaining theories, transformative learning and Vygotsky’s ZPD, believe in addressing the need to reduce the gap between the learner’s potential and actual learning state. Vygotsky’s ZPD stresses on collaboration among learners, besides stressing on both individual effort and outside assistance, whereas for transformative learning, the core is transformation.

The theories can be critiqued for their extensive focus on few identified elements in promoting learning. For example, cognitivism’s extensive reliance on human mental functions as an information processing model can be questioned. Similarly, connectivism’s belief that connections can be formed may be difficult in learning novel and complex materials. Not all learners are active learners, which challenges the very core assumption of heutagogy. Identically, social environment can sometimes lessen the pace of learning and
### Table I. Comparison of the theories’ parameters

<table>
<thead>
<tr>
<th>Construct</th>
<th>Transformative learning theory</th>
<th>Cognitivism</th>
<th>Connectivism</th>
<th>Heutagogy</th>
<th>Vygotsky’s zone of proximal development</th>
<th>Social learning theory</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Learning perspective</strong></td>
<td>Change in learning state</td>
<td>Learning involves processing of information</td>
<td>Learning involves linking current learning to previous experiences</td>
<td>Learners are active participants and not passive recipients</td>
<td>Learning operates in a zone and progresses</td>
<td>Social interaction as basis of learning</td>
</tr>
<tr>
<td><strong>Focus of learning</strong></td>
<td>Allowing learners to achieve an improved learning state</td>
<td>Cognitive domain</td>
<td>Generating sense from experience</td>
<td>Cognitive domain</td>
<td>Cognitive domain</td>
<td>Experiences, affective and cognitive domain</td>
</tr>
<tr>
<td><strong>Aim of learning</strong></td>
<td>Develop adults to be inquirers, examiners and challengers</td>
<td>Make learning engaging, motivating</td>
<td>Facilitate construction of knowledge</td>
<td>Support self-awareness, equip learners with skills</td>
<td>Bridge the gap between actual and potential state</td>
<td>Improve learning through interactions</td>
</tr>
<tr>
<td><strong>Role of instructors</strong></td>
<td>Support</td>
<td>Present information in an organized manner</td>
<td>Facilitate and agree upon meanings with learners</td>
<td>Facilitate</td>
<td>Elevate learning to potential state through effective instruction</td>
<td>Provide support</td>
</tr>
<tr>
<td><strong>Relevant adult learning principles and theories</strong></td>
<td>Self-directed learning, cognitive development, transformational learning</td>
<td>Learning the learning process, social role acquisition, age-connected learning, memory and intelligence</td>
<td>Reflective practice, communities of practice, situated learning</td>
<td>Self-directed learning, cognitive development</td>
<td>Experiential, transformational learning, situated learning</td>
<td>Self-directed learning, cognitive development, transformational learning</td>
</tr>
</tbody>
</table>

*Source: Merriam et al. (2007)*
## Table II.
Comparison of theories’ core beliefs, weaknesses and implications for online instruction

<table>
<thead>
<tr>
<th>Theory/model</th>
<th>Core beliefs</th>
<th>Critique</th>
<th>Implications for online instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transformative learning theory</td>
<td>Learning involves change in learning mode. Not all learning is change.</td>
<td>Sometimes learning also involves unlearning.</td>
<td>Create learning activities so learners can perceive a noticeable difference between the improved state and the initial state. Blogs, online activities and videos can help online educators design activities to encourage self-directed learning.</td>
</tr>
<tr>
<td>Connectivism</td>
<td>Learning occurs when knowledge is actuated through the process of learners connecting to the prior knowledge and feeding information into a learning community.</td>
<td>Relies on prior experiences to improve learning. Learner discretion plays a major role in determining the information suitability.</td>
<td>Online educators can create learning environment which is well integrated and builds on the prior learning experiences.</td>
</tr>
<tr>
<td>Cognitivism</td>
<td>Learning is an internal process that involves memory, thinking, reflection, abstraction and motivation.</td>
<td>Focuses only on internal knowledge conceptualization. Neglects the affective domain in learning. Places more emphasis on the instructors to engage learners.</td>
<td>The structure of online instruction can be aligned with the tenets of cognitivism. Streamlining information for working memory is helpful. Online educators can emphasize making knowledge meaningful by organizing the information into smaller chunks.</td>
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<td>Heutagogy</td>
<td>Learners are active participant in the learning process and not just passive recipients.</td>
<td>Over-reliance on personal experience in the learning process. Instructors’ role is passive.</td>
<td>The instructor’s role is passive, serving, rather as a course designer, resource provider, path creator and monitor, whereas learners own their learning and have improved flexibility to tailor its design to suit more appropriately their needs, pace, interest and skill. Online activities can be designed to promote interactions and discussions through blogs and other suitable discussion boards. Assignments involving teamwork can be designed and developed.</td>
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<td>Social learning theory</td>
<td>Emphasizes social interactions as a basis of learning.</td>
<td>Focuses more on learning as a result of the interactions; some learners may not be inclined to learn through social experiences.</td>
<td>(continued)</td>
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thus learners who learn best through problem-solving may have a hard time. Moreover, research has suggested that problem-solving through self-inquiry, even though slower than seeking support, may result in better learning (Roll et al., 2014). The biggest concern with Vygotsky’s theory of learning and transformative learning is determining the potential and actual state and how the potential state may not necessarily be discernible. Further, sometimes, unlearning is essential to get to a better state. Moreover, not all learners are social learners which may pose issues while describing learning through Vygotsky’s ZPD.

Strategies that boost deep processing for higher level learning can be used for long-term memory. Instructional strategies that require the learner to apply, analyze and synthesize will likely boost long-term memory. This approach is conducive for online adult learners. Examples of this approach would be learners applying theories to scenarios, analyzing case studies and creating a marketing plan or a school strategic plan.

Online course design strategies can follow a cognitive learning approach to elicit the best academic performance from the learner. Ally (2004) offers examples of online cognitive design to include the proper placement of relevant information on the screen; attributes of user interface and screen layout; the pacing of information; and multimedia design. Strategies for linking to prior knowledge can also include advanced information organization activities, conceptual models and concept checks (Ally, 2004; Arghode and Wang, 2016; Jepchumba and Gaceri, 2013). Most importantly, information presented online should be chunked to prevent cognitive overload. Lim and Kim (2003), using quantitative and qualitative analyses, found that gender and employment status affected online learners’ learning and learning application. The major finding from the study was that all motivation variables except course interest seemed to affect learning, whereas reinforcement and self-efficacy influenced application. From the qualitative findings, learners perceived personal interest as a relatively less important reason to their high learning and application compared to other categories. Course interest also did not show strong relationship with other motivation variables (except affect/emotion) and the learning and application scores as well.

Case-based learning (CBL) is a popular pedagogical approach, especially with graduate and online learners. Kantar (2013) claimed that CBL can be grounded with cognitivist approaches. The failure to use theories of learning when working with CBL may limit its effectiveness as a successful pedagogy for learners. Kantar (2013) took the cognitivist perspective and submitted that case method teaching has advantages over traditional instruction in that it promotes theoretical understanding and develops insights. Kantar highlighted an implantation of CBL in a nursing undergraduate program rooted to elements of behaviorism, cognitivism and constructivism. The implementation resulted in challenges from adopting a CBL pedagogy. Corrective measures and transformative actions evolved across cognitivism and constructivism that includes emergent issues, theoretical assumptions and

<table>
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<th>Theory/model</th>
<th>Core beliefs</th>
<th>Critique</th>
<th>Implications for online instruction</th>
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<td>Vygotsky’s zone of proximal development</td>
<td>Focuses on the gap between learners’ actual and potential state of learning. Stresses on individual effort as well as external assistance.</td>
<td>It may be difficult to ascertain a learner’s potential and actual learning state.</td>
<td>Vygotsky urged instructors to focus on learners’ future development, also stressing that instructors must encourage independent learning.</td>
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principles of case method approaches. CBL can then be facilitated online for group discussion and reflection within a group of adult learners.

The discussed theories suggest various pointers to improve online learning environment. Based on cognitivism, instructors can use media-based instruction especially designed for the working memory. Similarly, connectivism informs instructors to design instruction integrated with technology and online learning to establish access to learning networks and create activities essential to build and organize learners’ knowledge. Heutagogy also promotes integration of technology with online learning apart from encouraging self-directed learning. Social learning theory informs instructors to design group discussion and activities to foster collaboration and team work. The other three theories, viz., cognitivism, connectivism and heutagogy promote technology integration with learning experience, and thus instructors can create media-based instruction designed for the working memory, besides integrating technology and online learning to establish access to learning networks and create activities essential to build and organize learners’ knowledge. The next section presents conclusion of our review and reflection.

Research and practice implications
While general pedagogical frameworks are fairly well established for online learning at this point (Dennen, 2013), there are opportunities for more research in online instructional design for adult learners. Studies on learner motivation would establish a wider understanding of richer design formats that could elicit better performance of adult learners and make for richer educational experiences. Further comparisons of learning theories with regard to adult learners and what theories work best for which learners in an online module-by-module basis could be made to establish more empirical data as to which learning theory is better suited for online learning design for which learners with their differing learning styles. Further studies showing learner trends in using online media will help instructional technologists create online media content for higher impact. Finally, more research should be done on how connectivism-informed activities can help the professional learner connect to relevant practices and information from the field. In both research and practice, the existence of the ten theories we have reviewed in our previous article and this one underscore that there is no such thing as adult learning theory. There are many theories because learners differ in their learning needs and processes. One of the most obvious practical implications of our research articles is the emphasis on the need to acknowledge learners’ differences, use appropriate learning theory principles to design instruction and accept that online learning platforms may not be a complete replacement for face-to-face instruction. For additional specific suggestions in designing online instruction, refer to Table II.

Conclusion
In today’s environment, careers that lasted lifetimes now are measured in months or years (Lyons et al., 2015). Knowledge is growing exponentially, driving people to acquire new knowledge to be applied in the workplace (Ally, 2004; Tehrani and Riede, 2008; Yilmaz, 2011). In the discussion presented in this article, we attempted to capture the dynamic distance education field to indicate a connection with well-established learning theories. The learning theories largely remained unchanged and rarely investigated for their applicability and suitability in the ever-changing fields of learning and development. Improving online learning is important as online modality is often the preferred choice for instruction (Lim and Kim, 2003; Mishra, 2002). Moreover, if the trend continues, organizations will be offering an increased number of training programs online.
References


Further reading

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