Introduction

Distance education has been around in various forms for decades, from correspondence courses and radio-based learning to courses by satellite and CD-ROM to today’s online and blended courses. Throughout this time, the target audience has generally been “adult learners” - individuals for whom the existing structure of post-secondary learning does not fit. Despite a growing robust literature around online learning in general and on adults as learners in workplace learning, research specifically around learning for adults over 24 through distance education has been spotty. We set out to conduct a scoping review of the literature in this space to see what is well established and what has been lightly examined or not at all. In this paper, we first present our scoping review study, and then we discuss the benefits, challenges and the lessons learned from working on such a large inter-institutional and international team.

Literature Review

Learning happens in many circumstances, whether within the structure of an educational institution, a community event, or personal direction. Learning environments are categorized as formal, informal, and nonformal (Coombs, 1989; La Belle, 1982; Mocker & Spear, 1982). While initially organized around physical locations of learning, the structure can and has been applied to distance learning (Lowenthal et al., 2009). This scoping review is limited to empirical research
conducted on adult learning delivered at least partially from a distance and by a "formally constituted institution of education" (Hager, 2012, p. 1314).

The U.S. Department of Education records separate metrics for “nontraditional learners,” including those who are age 24 and older (Radford et al., 2015). Findings from the fields of neuroscience (Fjell et al., 2013) and psychology (Ackerman, 1996; Hagen & Park, 2016; Horn & Cattell, 1967; Salthouse, 2010) provide further evidence for classifying adults as a different type of learner.

Learning happens in many circumstances, whether within the structure of an educational institution, a community event, or personal direction. Learning environments are categorized as formal, informal, and nonformal. While initially organized around physical locations of learning, the structure can and has been applied to distance learning. This scoping review is bounded by research conducted on adult learning in formal learning settings defined as associated with an educational organization (non-credit or for credit).

Regular data collection by the US Department of Education does not capture enough about participation of adult learners in distance education for several reasons: 1) the primary focus is on first-time, first-year students, 2) population distinctions do not specify the modality of teaching/learning; indeed they assume an in-person learning environment, and 3) most data collected around distance learning per se focuses on traditional student populations (Advisory Committee on Student Financial Aid Assistance, 2012).

Several learning theories, models, and frameworks have been researched and found effective for online education. These include Community of Inquiry (Garrison et al., 2010), Connectivism (Siemens, 2017), and Online Collaborative Learning (Harasim, 2012). However, age is often not a variable studied.

We located eight existing systematic reviews of adult learning in distance education in a search of the literature. Three of these articles focused specifically on health-care education (Carroll et al., 2009; Peterson, 2009; Wu et al., 2018), and one each focused on communities of practice (Abedini et al., 2021), problem-based learning (Jurewitsch, 2012), heutagogy (Moore, 2020), computer games (Turner et al., 2018), and adventure learning (Veletsianos & Kleanthous, 2009). No systematic reviews looked specifically at the learning processes that adults experience in distance education.

Distance education is growing as a popular learning modality for adults though its presence in the literature is limited. Similarly, there is a gap in exploring the learning processes of adults, and a systematic review on this topic has not been conducted. A scoping review of the literature will lend the field of instructional design a holistic view of adult learners in distance education contexts and a baseline for identifying shortcomings and gaps in the literature. The research goals are to (1) map the current state of empirical and analytical research on adult learning in distance education; (2) identify gaps in the literature and directions for future research, (3) synthesize definitions, and (4) organize concepts and literature for other researchers and practitioners.

Research Questions and Definitions

The research question guiding this study is: How are researchers studying the ways adults learn in distance education? More specifically, we will explore:

1. What are the characteristics of studies on adult learning in distance education?
2. What research methods were employed to study adult learning in distance education?
3. What trends and gaps in research on adult learning in distance education emerge?
We defined “adults” as age 24 and older as reflected in the U.S. Department of Education definition of nontraditional learners. We explored “learning” as it relates to any actions directly connected to course content or skills, affect, or the self-regulation necessary for student academic success. Our context was “distance education,” meaning not in the same location or a hybrid combination of traditional and remote learning, either synchronous or asynchronous instruction provided by an educational entity.

Methodology

This scoping project addresses the issue of current ambiguous terminology and lack of comprehensive review of the literature on adult learning in distance education (Peters et al., 2015). A scoping review methodology is appropriate for the anticipated diversity of studies to be included to address the broad questions under investigation (Peters et al., 2020). Given the nature of scoping reviews, articles included were not assessed for quality in terms of methodological limitations or risk of bias. Our study utilized the protocol outlined in the JBI Manual for Evidence Synthesis (Peters et al., 2020). The team developed a protocol and utilized similar keywords to search institutional access databases to identify potential articles based on inclusion criteria. Searches were conducted in July 2021 and were not limited by date. Studies after that date have not been included. The initial search yielded 20,241 potential articles for review. After removing duplicates, the total abstracts reviewed included 11,227.

Fig 1. PRISMA diagram showing abstract screening results throughout the three phases of the project.

The research team utilized the Abstrackr platform from Brown University (Wallace et al., 2012) to screen the abstracts, where at least two researchers reviewed each abstract, and the team collaboratively resolved any conflicts. In the first round of abstract reviews, the team labeled 915
articles to be included, 912 as “maybe”, 1,342 received conflicting ratings, and 3,770 were excluded (see Figure 1). The AI in Abstrackr marked 4,288 abstracts as irrelevant based on our coding patterns. We took a random sample of 100 abstracts to confirm that these were indeed irrelevant. At this point, the team worked to refine the criteria to be more specific in our definitions and developed a job aid to assist in evaluating the abstracts (see Figure 2). The team conducted a second round of reviews of the abstracts marked “maybe” and those with conflicting scores which resulted in an additional 251 records to be included. In total, 18,786 labels were created in these first two rounds.

The researchers utilized Covidence to review the remaining records again. An additional 178 records were identified as duplicates, 577 were excluded, and 411 were included for the next phase. The full text was retrieved for each of the 411 records to determine if the article actually met the inclusion criteria. Those that will be included will be coded by research type, population, context, learning activities, and subject area. Covidence software will be used to extract data from the indexed articles to create a map of the literature. Descriptive statistics and crosstabs will be used to analyze the quantitative data and thematic analysis will be used for the qualitative data.

Preliminary Results

The research team has completed three rounds of abstract reviews to identify the records that have the most potential for meeting the criteria of studying how adults learn in distance
education. We have documented our observations from the abstracts we have reviewed, describing what we saw in the records we included and excluded (see Figure 3).

Reasons for which an article was excluded are as important as reasons for which an article was included. These exclusion criteria help in keeping the focus of the scoping study tight while enabling an understanding of the motivations and drivers supporting the study. Of the studies we excluded, we found that a great proportion of them only reported on student perceptions of learning or only provided recommendations for teaching adults in distance education without presenting empirical data on student learning. While understanding the experience of the adult learner is important, student perception alone is insufficiently reliable to be the only measure. Learners are often not accurate judges of their own learning (Avhustiuk et al., 2018; Deslauriers et al., 2019; Kirk-Johnson et al., 2019). Comparing course modalities without describing the learning, only evaluating the effectiveness or preference of a tool, focusing on learner retention, labeling traditional-aged undergraduates as adults, examining motivation for learning rather than learning itself, and focusing on the design of the instruction rather than its effect on learners were also commonly found exclusion reasons.

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<th>Excluded Records</th>
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<td>Student perceptions only</td>
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<td>Technology evaluation</td>
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<td>Traditional undergrad</td>
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<td>Retention-focused</td>
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<th>Included Records</th>
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<td>Topic of Instruction</td>
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<td>Language Learning</td>
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<td>Medical professions</td>
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<td>Focus of Research</td>
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<td>Social presence</td>
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*Note: Bars show trends, not actual values.*

Fig 3. Preliminary results showing focus of excluded and included records.

While adult learning in distance education was studied in relation to a number of different fields, we found that the language learning and medical education studies were more likely to describe and measure the learning than any other topic area. The focus of the included studies
also varies. Many focused on the use of a particular technology and they also described and measured the learning of the students, either quantitatively or qualitatively. Similarly, there were also many studies that compared learning between face-to-face and online learning modalities. Other common research foci included collaborative learning, including the Community of Inquiry, social presence, and several other specific topics. Results of the data extraction will be reported at a later date.

Team Processes

The value of this research extends beyond the results of the scoping review to come. The experience of assembling, managing, and collaborating as an international and inter-institutional team of 17 researchers merits its own examination. The large team of researchers is located at different institutions, in different time zones and in different countries. We will describe how the team formed and how members learned of the project, their motivation for participating, and how they managed to persist in a long-term project. We will also share what the team members learned throughout this process, the pros and cons of working on a large team, and the strengths and weaknesses of our particular project. Each team member was asked to reflect on their experience participating in the project. Their voices and perspectives are shared in aggregate below.

Recruitment

The genesis for this project came from the frustration of the lead author who struggled to find quality literature that examined adult learning processes in distance education. Most of the literature she encountered was either (a) about distance learning but did not address age groups or adult learners or was (b) about adult learners but addressed general recommendations not empirical study of learning processes. The lead author reached out to other doctoral students she had met through AECT to form a research team. The project was often discussed at Graduate Student Assembly meetings, so other doctoral students have joined the project during the past 16 months. The lead author posted calls for participation several times over the course of the project on Facebook, Twitter, and Gather which resulted in additional members joining, some who had experience conducting scoping reviews or had completed their doctoral degrees and were experienced researchers.

Motivation to Participate

Motivation to participate in this project varied among the team members. Some members had experience with systematic reviews and were looking to continue this work, while others wanted to increase their experience conducting empirical research. Most had a passion for adult learners and distance education as their primary motivator, and some were hoping to find resources that would be beneficial for their current work with adult learners in distance education as faculty or instructional designers. Other researchers who joined the team later were impressed with the protocol and rigor of the study and wanted to be involved in the project as a collaborative opportunity.
Persistence

Persisting on a long-term research project can be a challenge, especially one that requires hours of tedious work when there are so many other competing demands. Some members of the team have left the group because they were not able to make the time for the project, and some have left the project temporarily to address a major life issue before returning to the project. The project coordinator reiterated to all group members that this was to be expected and that everyone was welcome back if they needed to take a break. Notes for each of our bi-weekly meetings were kept in a running document, including a recording, a weekly update summarizing progress and decisions was sent out by the project coordinator and archived in a google group, and ongoing conversations were maintained in Slack. This let people feel like they could stay up to date with the project even when they were unable to participate.

When asked about their persistence on this project, several of the team members noted the camaraderie and relationships that have developed which make participation enjoyable. There is tremendous respect and admiration for each other. Others noted the helpful articles they have discovered or the skills that they continue to develop as part of the project. One team member explained,

I have realized that my article reading and analyzing process get better as I keep doing so. I have had the opportunity to discuss my decisions with other reviewers especially when I have wavered between two decisions. Additionally, the weekly meetings have helped me learn different perspectives towards looking at an article.

Completing most of the work asynchronously has provided the flexibility that many members of the team needed to work around their busy lives. With so many researchers in multiple time zones, it was not possible to find one common meeting time, so two meetings were held each week to accommodate the complex schedules. One researcher shared a strategy that helped her continue to plug away at the project. “I keep the Scoping Review tabs grouped on my browser window. That way, when I needed a bit of a mental break, I reviewed some abstracts. Keeping it accessible in the browser kept it on my mind.”

Lessons Learned by Team Members

Most of the team members had never conducted a scoping review before, so this project was an opportunity to become familiar with this methodology. Many of the team members recognized how much more they have learned by being part of a team than they would have on their own. Managing team dynamics and balancing multiple responsibilities were noted skills that were developed. One team member commented on the tolerance and understanding we have for each other in the challenges we each face, which has contributed to our sense of community and dedication to one another.

Several team members commented on the importance of shared definitions and documenting all of our work. For example, some of our conflicting ratings came from mismatches in what counts as learning. We spent several weeks searching the literature for definitions of learning and discussing what we would and would not consider to be learning for the purposes of this study. Seeing so many abstracts was a learning experience in itself for most of the team. One researcher explained, “I think my own manuscripts have improved because of the number of abstracts and articles we've reviewed. Reviewing so many works and looking for specific information (which was sometimes difficult to find) has reinforced the importance of alignment, clarity, details, and precision.” Documenting all of our work and creating the short
weekly summaries has been helpful for us to be able to go back and revisit decisions, report on our progress, and to easily onboard new team members. A few of the researchers noted the importance of strong leadership in a large project like this.

Pros and Cons of a Large Team

Working with such a large team has both its benefits and challenges. There are 17 researchers who have made substantial contributions to this project so far, from 16 different universities in four countries from around the world. A dedicated leader for a team of this size is essential as is the selection of appropriate tools and a system for documenting all of the work.

Team members identified several pros and cons of working on a large team. For example, one researcher noted, “diversity of opinions and perspectives (discussing what to include and exclude is so much stronger when dialogically argued over by a large group).” She also expressed that time was a challenge but worth it for the rigor. Another team member said, “Pros: diverse intellectual and cultural perspectives, more ideas generated, more help. Cons: challenging to coordinate, time zones and busy schedules make it difficult to arrange synchronous meetings that work for all.” These are consistent with the findings from Daudt et al. (2013) who conducted a scoping review with a large inter-professional team. They reported, “the strengths include breadth and depth of knowledge each team member brings to the study and time efficiencies” (p. 1).

A simple calculation shows the benefits of working with a large team. In our first two rounds of abstract reviews, we recorded 18,786 labels (see Figure 1). If each abstract required an average of three minutes to read, evaluate, and label (many required much more time), that adds up to 56,358 minutes or 939 hours. This is an extraordinary amount of time for a small research team to spend, but only 55 hours per person if spread evenly over 17 team members. The additional team members add to the complexity of the project but also reduces the burden on individuals.

Project Strengths and Weaknesses

Arksey and O’Malley (2005) explained that when conducting a scoping review, “The process is not linear but iterative, requiring researchers to engage with each stage in a reflexive way and, where necessary, repeat steps to ensure that the literature is covered in a comprehensive way” (p. 22). When asked about the strengths and weaknesses of our project, one team member noted, “The start (not necessarily weakness) had growing pains (expected) and we had to figure out what works and doesn't work. It requires flexibility, some rework, and ability to problem solve - also patience!” Having read several studies on scoping reviews, the team was prepared to accept the iterative nature of this type of research. We made several attempts at searching databases with various keyword combinations and worked together as a team to determine our final search string. We reviewed the abstracts multiple times as we came to understand the nature of the literature on adult learning in distance education so that we could make more informed decisions about our inclusion and exclusion criteria. Throughout the process, we found that we needed to be more specific with our definitions and what they look like in research studies. Documenting all of these discussions and this process helped new members to understand the criteria and feel more comfortable with making decisions on abstracts. One researcher explained, “we had to learn as we went about best practices, design methods, best tools for analysis, and deciding what we were actually going to analyze … it was and remains a work in progress.”
Synchronous discussions in weekly Zoom meetings were where we hashed out most of our team decisions, although we did carry on conversations asynchronously. One weakness of this project was the inability to find a common time for everyone to meet. With team members in Malaysia, British Columbia, the UK, the east coast of the US, and other places in between, we could not find a time when everyone was available. The team member from Malaysia noted that an 8:00 am EST meeting is at the end of her day at 8:00 pm, so she is often exhausted and is not able to contribute as much as she would like, while the team member in Utah found morning meeting times to be a challenge as she juggled her work and a toddler at home. We tried to address this challenge by adding the Slack platform to make asynchronous communication easier than it was with the Google Group and asking for input from each member of the team before we made decisions about definitions, inclusion criteria, or technology tools. All of the zoom meetings were recorded, and this was helpful for team members to catch up on missed meetings or for new members to familiarize themselves with the project.

One of the strengths of this team was how tech savvy the members were as the majority of the researchers were engaged in educational technology is some form. This allowed us to explore a variety of technology tools and strategies to find the ones that worked best for us. The tools that we found to be most helpful were Google Drive, Docs, and Groups, Zotero to maintain a shared library of our records, Slack for ongoing conversations, Covidence for full text review and data extraction, and VOSViewer for bibliographic analysis.

We looked at several tools to assist with reviewing the abstracts and doing data extraction of full-text articles. These included Rayyan, Abstrackr, Cadima, Covidence, SRDR, and a custom solution in Google Forms. The features that drew us to Abstrackr were the simple interface, the ability to select keywords for color coded highlighting, tags that could be added to abstracts, a notes tool, and most importantly, the artificial intelligence that continuously learned from our labels to sort the remaining abstracts by relevance. Using this tool saved us from reviewing almost 5,000 abstracts, which was a big time saver. However, only a limited number of fields could be imported with each record. Because we lost the DOI and URL field from any record that had them, we were unable to use a tool to automatically locate and import full text articles for those we wanted to review. This made it necessary for us to manually locate and upload pdf full text for the 411 records included in that round.

Conclusion

It is an ambitious undertaking to map the literature on a specific topic, but the scoping review methodology is an appropriate strategy. Our research team found that having many hands made light work. Our initial findings include a lack of research that specifically focuses on the process of learning in adults in distance education; most literature used student perceptions and satisfaction as the data source while other articles included recommendations for working with adult learners in distance education without empirical data on adult learners. Language learning and medical continuing education were the two dominant fields that described and measured learning processes of the adults in their studies. Scoping reviews are iterative in nature requiring multiple reviews of searches and abstracts to determine the final inclusion criteria. This team benefitted from the wisdom and experience of so many voices in this process which led to a richer understanding of the literature and a more rigorous study.

The recent global pandemic has drawn attention to distance learning in general. With increasing disruptions to learning due to global events, including increasing numbers of non-traditional learners (Garret et al., 2021; OECD, 2021), developing a deeper understanding of the
current state of empirical and analytical research on adult learning in distance education is becoming more pertinent. Once completed, this scoping review will provide synthesized definitions, suggestions for future research, and organized concepts and literature for other researchers and practitioners to consider for future research.
References


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