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Adult Learning in Online Communities of Practice: A Systematic Review

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Abstract

Background: *Adult learning is a lifelong process whereby knowledge is formed through the transformation of adults' experience. Research on online adult learning has been on the rise in recent years, thanks to the innovative opportunities provided to adults by digital technologies. Online communities of practice (OCOPs) a one of such opportunities, which offer the potential to bring geographically dispersed adult learners together through a common interest.*

Aims: *Despite an increased growth in the use of OCOPs by adults in various professional sectors, there is still a lack of understanding of the characteristics of online adult learning in OCOPs, and the facilitators and hinderers influencing engagement in these communities. This paper presents a comprehensive synthesis of research literature on online adult learning in OCOPs to understand its characteristics and what may facilitate or hinder adults' engagement in these communities.*

Method: *A review has been conducted using a systematic, rigorous, and standard procedure, aiming to summarise and synthesise existing research on the topic and to provide analytical criticism.*

Results: *In total, thirty-seven studies were included in this review. Findings revealed that members of OCOPs are independent, experience-centred, problem-centred, self-motivated, goal-oriented, and lifelong learners with the purpose to achieve professional outcomes. Moreover, the results revealed how the engagement of adults in OCOPs could lead to improving learning processes. Findings also showed that the level of engagement is influenced by aging, fatigue caused by a busy life, resistance process due to learning new technologies, lack of personal evolution, interactive learning settings, motivation, self-regulation and competition factors.*

Conclusion: *This study revealed facilitators and hinderers of engagement in OCOPs. The study extended andragogy to digital environments and contributes to the theory by making sense of characteristic of adult learning in OCOPs.*

Keywords: *Adult learning, Adult engagement, Lifelong learning ,Online Communities of Practice, , Systematic Literature Review*

Practitioner Notes

What is already known about this topic:

- The importance of lifelong learning for adults in the digital era has been stressed by past studies.
- Digital technologies have offered new opportunities for professional adults to continuously develop their skills and knowledge.
- Online communities of practice can facilitate self-directed and individual-centred learning.

What this paper adds:

- Enhances our understanding of online adult learners as lifelong learners taking advantage of OCOPs for professional and personal development.
- Provides a systematic literature review (SLR) of recent studies on online adult learners' characteristics.
- Presents facilitators and hinderers of adults' engagement in OCOPs.
- Makes recommendations on future research and practice into lifelong learning in the digital era.

Implications for practice and/or policy:

- There is a need to reframe the way lifelong learning via OCOPs is defined, to account for adults' needs more effectively, where individuals are better engaged to share their experiences that are valuable to them and connects them with their peers to build sustainable online communities.

Adults are also encouraged to more actively engage in OCOPs, as this process can increase opportunities for knowledge sharing, engaging in collaborative activities and sustaining these interactions.

1. Introduction

Adult learning, at first glance, seems a simple phenomenon (Merriam, 2010). It is a crucial part of everyday life, and it is the process of transforming life experience into knowledge and skills (Illeris, 2010). Past studies have described adult learning as a lifelong process whereby knowledge is created through the transformation of experience (Illeris, 2010; Kolb, 1984). However, it is also reported as a complicated process because there is no one definition, model, or theory that explains how adults learn, why they learn, how best to facilitate their learning process (Merriam, 2010), and why adults engage in the learning process (Boeren, 2017). In addition to this, adult learning tends to be a highly self-directed and independent process (Merriam, 2010). Self-directed learning is a complex phenomenon, involving a range of activities, decision-making strategies, learning experiences and a degree of responsibility for accomplishing learning goals (Beach, 2017). Adult learning's importance has particularly been influenced by the opportunities digital technologies have offered in recent decades, as adults can have lifelong engagement with various learning opportunities available to them for professional and personal development purposes (Boeren, 2017).

Wenger, McDermott and Snyder (2002) defined a community of practice as a group of people who share a common interest, a collection of problems, a passion for a subject, and an interest in deepening their awareness and expertise in a given field by continuously engaging with the community. Online Communities of Practice (OCOPs) fit within this definition as they are informal groups of individuals engaged in a common practice or interest to share ideas, exchange information and seek advice (Cho, 2016; Gunawardena, Hermans, Sanchez, Richmond, Bohley and Tuttle, 2009; Kumi and Sabherwal, 2018; Zhang and Watts, 2003). OCOPs mitigate the hinderers of distance, time limitation and members' isolation and increase opportunities for knowledge sharing, engaging in collaborative activities and sustaining these interactions (Jesionkowska, 2020; Pesare, Roselli and Rossano, 2017). OCOPs use internet-connected communication to facilitate interactions through online technologies such as group discussion, question-answer mechanisms, online discussion, instant messaging, and social groups (Kumi et al., 2018; Yilmaz and Yilmaz, 2019; Sadeghi and Kardan, 2015).

Previous research has investigated the effects of engagement on enhancing the quality of life of adult learners (Wedgeworth, LaRocca, Chaplin, and Scogin, 2017), the engagement factors (Abu Bakar, Tengku Wook and Sahari, 2017), and the lifelong learning experiences and self-regulation capabilities (Mu, Chai, Wang and Chen, 2019; Broadbent and Poon, 2015; Malinen, 2015). Most previous studies have investigated the effects of engaging in OCOPs on learning outcomes (Boulton and Kent, 2018; Guo 2018; Kumpas-Lenk, Eisenschmidt and Veispak, 2018; Panigrahi, Srivastava and Sharma, 2018; Post, Guo, Saab and Admiraal, 2019). Yet less attention has been paid to characterising online adult learning in OCOPs where individual adults engage in a targeted interest and shared passion (Grangeia, de Jorge, Cecilio-Fernandes, Tio and Carvalho-Filho, 2019; Malinen, 2015). Further to this, less has been

done in understanding what may facilitate or hinder engagement in these communities and in turn learning processes. Thus, the research described in this article aims to address two main research questions:

What are the characteristics of adult learning in online communities of practice?

Which facilitators and hinderers interplay with adults' engagement in online communities of practice?

In order to get an overview of research on adult learning in OCOPs, previous literature on the topic was reviewed (research background), aiming to provide an overview of existing knowledge in current research. The research background section of this study focuses on the definitions used in previous research to describe (1) adult learners' characteristics in OCOPs, and (2) what may facilitate or hinder adults' engagement in OCOPs. Section 3 details the SLR planning and execution. In the results section, the aim described above is elaborated upon based on analyses of the collected studies (section 4). This is followed by conclusions and discussion on the main results (sections 5 and 6).

2. Research Background

2.1. Adult learning

The critical question of how adults learn has occupied the attention of scholars since the founding of adult learning as a professional field of practice (Merriam, 2001). This study adopts the andragogy theory for characterising adult learners in OCOPs. Andragogy was selected because it is a learning theory that is designed to address specific adult needs (Knowles, 1973), and has been adopted by various scholars for multiple learning settings (Cercone, 2008; Berg, Mani, Marinakis, Tierney and Walsh, 2015; Noe, Tews and Marand, 2013). Although andragogy may not an all-encompassing theory of adult learning, but it still sparks debate and “constitutes one piece of the rich mosaic of adult learning” (Merriam and Caffarella 1999, p. 278). Essentially, andragogical theory explains adult learners' characteristics in terms of the following four main principles (Knowles, 1980): (i) Independent self-concept, (ii) Experience-centred, (iii) Professional outcome, (iv) Problem-centred. In later publications, researchers also suggested fifth and sixth principle (Merriam 2008): (v) Self-motivated and (vi) Goal-oriented.

Some empirical studies examine the behaviour and opinions of individuals with higher degree of education (Cárdenas-Robledo and Peña-Ayala, 2018; Shang and Wu, 2019). However, adult learning differs from this setting, since it is more directly related to the past experience, professional development and outcome-oriented expectations of the individual (Cheng, Wang, Yang and Peng, 2011; Shang and Wu, 2019). Adult learning is not a unique and specific process. Generalisations about adult learners imply that people over a certain, yet to be defined, age are part of a similar group. But differences in culture, life experiences and learning settings may be far more important to adult learning than age (Knowles, 1980).

2.2. Online Communities of Practice

Communities of practice (COPs) consists of informal groups of participants, who engage in various activities that involve a common practice or interest (Wenger et al., 2002). These participants share ideas and information and seek advice and support one another (Cho, 2016; Gunawardena et al., 2009; Kumi et al., 2018; Zhang et al., 2003). According to Sherer, Shea and Kristensen, (2003), an online community of practice (OCOP) has three main characteristics: (1) an individual's involvement requires some knowledge of the domain area, (2) members must interact and learn in collaboration with one another by helping each other and sharing information, and (3) members should build a shared collection of online resources such as stories, experiences and methods of addressing recurring problems. The advantages of OCOPs are the ability to connect members, to share information and to promote an effective engagement in the learning process (Pesare et al., 2017), mitigating distance hinderers, and time limitation due to busy life, increase knowledge-sharing opportunities and engage in collaborative activities (Jesionkowska, 2020; Pesare et al., 2017). The popularity of OCOPs and their potential benefits have been explored in previous studies, with one significant stream of research focusing on the reasons that members contribute their time and knowledge to these communities (Kumi et al., 2018). Scholars have put forward several reasons, ranging from self-esteem to self-sacrifice, as all the way to conformist considerations (Faraj and Wasko, 2001). An online community of practice evolves out of its members' willingness to complete tasks in order to further develop their learning path, where different levels of professional expertise are simultaneously presented between members (Chung and Chen, 2018). Therefore, the successful functioning of an online community of practice is impossible without the active engagement of all types of members, from beginners to experts.

2.3. Adult engagement in Online Communities of Practice

A range of studies have pointed out that an online community of practice provides opportunities to its members to become interactive participants (Agrawal and Snekenes, 2017; Diep, Cocquyt, Zhu and Vanwing, 2016; Jesionkowska, 2020; Nuutinen and Filho, 2018;). In addition to this, it has been generally acknowledged that these

communities function as a catalyst for improving adults' engagement (O'Neill, Light, and Pope, 2018;). According to Matzembacher, Gonzales and do Nascimento (2019), such engagement is a vital part of the learning process. However, promoting adults' engagement through OCOPs is not a straightforward process. It has been proven that there needs to be a sustainable level of engagement in the online community for it to be successful. The absence of engagement degrades the members' learning efficiency and effectiveness of the process (Cheng et al., 2011; Jung and Lee, 2018; Lee and Desjardins, 2019; Shang et al., 2019). Hence, understanding adults' engagement is critical for the success of learning strategies and the enhancement of one's learning process in OCOPs.

There are several important aspects of adults' engagement in OCOPs that must be taken into account in order to understand it. Firstly, OCOPs have caused a shift towards the decentralisation of the learning process. This has resulted in a stronger emphasis on sharing experience than in traditional settings, and a higher volume of problem-solving using past experience. Therefore, participants have become involved in a wide range of engagement practices from experience sharing to contributing to real-world projects. Secondly, the sense of belonging to a community and the purpose of the engagement are two determining elements which affect participation in OCOPs (Tang and Chung, 2016). Moreover, research efforts should be shifted from examining the nature of communities of practice to OCOPs, and from scrutinising the benefits of such communities to exploring how they promote success in adults' engagement. Thirdly, members of the online communities may have diverse backgrounds and are therefore influenced by different contexts and past experiences. They are more likely to exchange information if they share a common understanding and skill (Kumi et al., 2018). This would also help provide a frame of reference to comprehend the values that guide expectations in an online community of practice. Finally, we need to consider not only the causes of the online adults' engagement process but also its consequences in real life. The effects of participating in OCOPs range from immediate results to the gradual acquirement of new knowledge (Marcaletti, Iñiguez Berrozpe and Koutra, 2018). Through engagement, members of an OCOP share their experiences and learn from each other (Kumi et al., 2018). As already mentioned, OCOPs mitigate distance hinderers, time limitation due to an adult's busy life, increase knowledge-sharing opportunities, engage in collaborative activities, and sustain these interactions (Jesionkowska, 2020; Pesare et al., 2017). Therefore, it is necessary to identify what may facilitate and hinder online adults' engagement in OCOPs and its potential impact on learning processes. In summary, researchers have focused on the online adult learning in OCOPs to explore adult learners' characteristics in these communities and identify facilitators and hinderers which may interplay with their online engagements. Because as we mentioned above, engagement has been identified as a key aspect in an online community to sustain interest and to promote the willingness to collaborate in exchanging information between members (Pesare et al., 2017). Therefore, the scope of this systematic review is primarily on the online learning, both for community and for adults. In the rest of this paper, whenever we refer to community learning or adult learning, we are referring to online adult learning.

3. Research method

To address the research questions, we have conducted a systematic literature review.. A systematic literature review is an approach to reviewing past research and can be applied to most types of review (Elliott et al., 2017). A rigorous and scrupulous procedure is required to search and select the sample studies for analysis.

The process of collecting published studies of acceptable quality is a methodical and meticulous one. A systematic criteria need to be used for selection to reduce researcher bias and provide transparency (Bano, Zowghi, Kearney, Schuck and Aubusson, 2018; Sharma and Giannakos, 2020). We used the guidelines provided by Kitchenham and Charters (2007) to conduct our systematic review. These guidelines have been widely used in various disciplines, including in the educational technology literature (e.g, Breien and Wasson, 2020). They are consistent with similar guidelines such as Standard Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher, Liberati, Tetzlaff, Altman and Prisma Group, 2009), as both of them recommend search strategy, identifying inclusion and exclusion criteria, data collection, quality assessment, data extraction and analysis and reporting the findings as the key steps for undertaking the review.

3.1. Search Strategy and inclusion and exclusion criteria

We searched seven major information system databases and four online education databases (see appendix 1) for journal articles on adult learning in OCOPs and adults' engagement in OCOPs. A Boolean search was performed on each database using the following search terms: adult learning (concept 1), Online Communities of Practice and adult learning (concept 2) and adults' engagement and learning (concept 3). The other vital criterion was that the studies' focus was on adults' engagement or adult learning in OCOPs. The string was adjusted according to the requirements of the various online databases, thus maintaining a consistent logical order. To ensure we did not skip any important studies, we applied the search string to several databases (see Appendix 1 for selected databases and search engines).

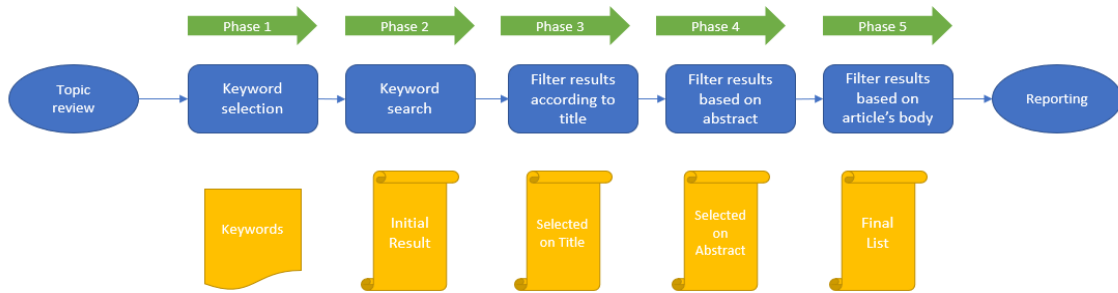


Figure 1: The publication selection process.

Table 1 shows the result of the preliminary keyword search extract. Following Kitchenham et al.,'s (2007) steps, we also employed the snowballing technique, in which the references of sources that were deemed relevant were reviewed to find missing studies. The main advantage of snowballing, when compared to the search string strategy for systematic literature reviews, is the ability to reduce the number of studies to be analysed while still presenting a good identification of relevant papers (Felizardo, Mendes, Kalinowski, Souza and Vijaykumar, 2016). The new findings were judged using the same steps as the original database search. To ensure that selected papers were relevant to the topic, our focus remained solely on adult learning, sources must have had discussions of applied online settings, and the literature must discuss adult learning. Therefore, our inclusion criteria were research articles that had been written in English and published between 2012 and 2020, inclusive.

	Adults Engagement			OCOPs			Adult Learning			Total
	Keyword Search	Selected Paper	Snowballing	Keyword Search	Selected Paper	Snowballing	Keyword Search	Selected Paper	Snowballing	
Database										
ACM Digital Library	28	1	0	120	2	0	166	1	0	
Computers and Applied Sciences Complete (EBSCO)	16	2	0	308	2	0	83	8	0	
IEEE Xplore	38	2	1	18	10	2	75	9	1	
INSPEC (Institution of Engineering and Technology)	8	0	0	66	5	0	367	1	0	
ProQuest Science & Technology	296	1	0	760	5	1	1406	11	0	
SCOPUS (Elsevier)	110	2	2	390	8	0	1210	11	1	
A+ Education: Australian Education Index Plus Text (AEIPT)	16	0	0	19	0	0	1702	0	0	
Education Database (ProQuest)	48	2	0	369	3	0	1964	10	1	
Academic Research Complete	57	3	0	66	0	0	1712	3	0	
sciencedirect	133	2	0	262	1	4	1920	4	1	
SpringerLink	223	0	0	503	0	0	809	3	0	
Total Per Keywords	973	15	3	2881	36	7	11414	61	4	
Grand Total	973			2881			11414			15268
Selected Paper for abstract and title	23			39			112			175
Final list	8			10			19			37

Table 1: Studies initially identified and included in the final list

To conduct the search and collect results from online databases, we carried out the following steps recommended by Kitchenham et al.,'s (2007) and shown in Figure 1.

1. Phase 1: Scoping the review and finding search keywords.
2. Phase 2: Applying search keywords to identify relevant publications in online databases.
3. Phase 3: Screening each publication's title to filter out irrelevant papers quickly.
4. Phase 4: Evaluating each publication's abstract against the research topics.
5. Phase 5: Reading and evaluating each selected publication's full text against the research aims.

The selection phase determines the overall validity of the studies for the literature review, which is why, it is important to define specific inclusion and exclusion criteria. We applied four quality criteria (see Appendix 2) informed by related works (Sharma et al., 2020). Therefore, studies were eligible for inclusion if they were focused on adult learning in OCOPs. The aforementioned criteria were applied in phase 5 of the selection process (Figure 1) when the researcher had to assess the papers based on their full content.

3.2. Data extraction

The following results were extracted from the included publications to be later used for cross-analysis: title, authors, name of journal or conference, publication year, the geographical location of publication, which theory was used in the study, and the study's contribution to adult learning. We manually categorised, synthesised and analysed the studies. All the PDF files of the included studies were reviewed in order to extract answers to the research questions according to the guidelines provided in Appendix 3.

4. Results

In this section, we provide the result of the search for this study. Using the keyword search, 15268 studies had been retrieved from the online databases (Phase 2). After reviewing titles 591 paper selected (Phase 3) which resulted in a set of 175 unique papers after re-scanning the titles and reviewing abstracts (Phase 4) to filter out irrelevant studies and removing duplicates. Out of these 175, only 32 were included in the systematic literature review (Phase 5). At the same time, 11 further studies were retrieved using forward snowballing. Of these, five were selected for inclusion applying the selection criteria (see Appendix 2).

4.1. Geographical distribution

We found a total of 37 papers contributing to the definition of adult learning or adult engagement in OCOPs. Even though our review only includes English language studies, our final selection was made up of papers published in various countries around the globe. The United States dominated the results with the highest number of studies, followed by Germany and Romania with three studies. Next came Australia, Belgium, Canada, China Malaysia and UK has the least number of studies, with two papers each.

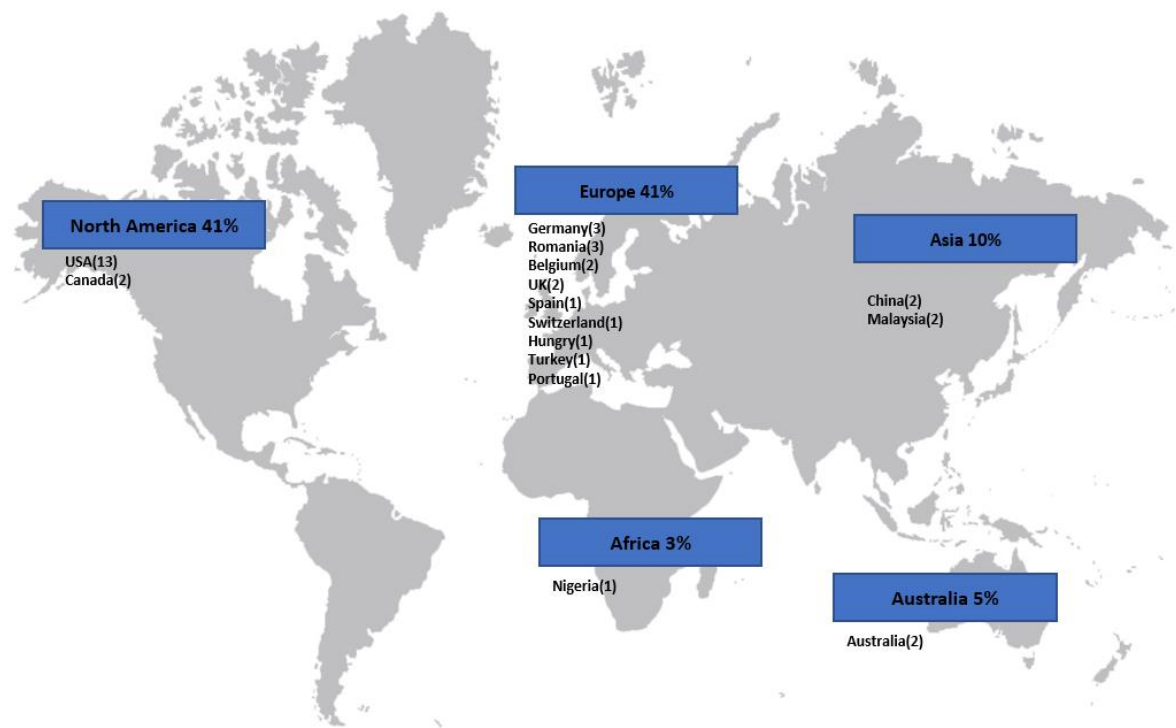


Figure 2: Selected studies by country

4.2. Year of publication

The final 37 studies were published from 2012–2020. Since 2015, there has been a sudden increase in research into adult learning in OCOPs, which may be attributed to the increased usage of these communities. Fig. 3 shows the studies with respect to their publication timeline.

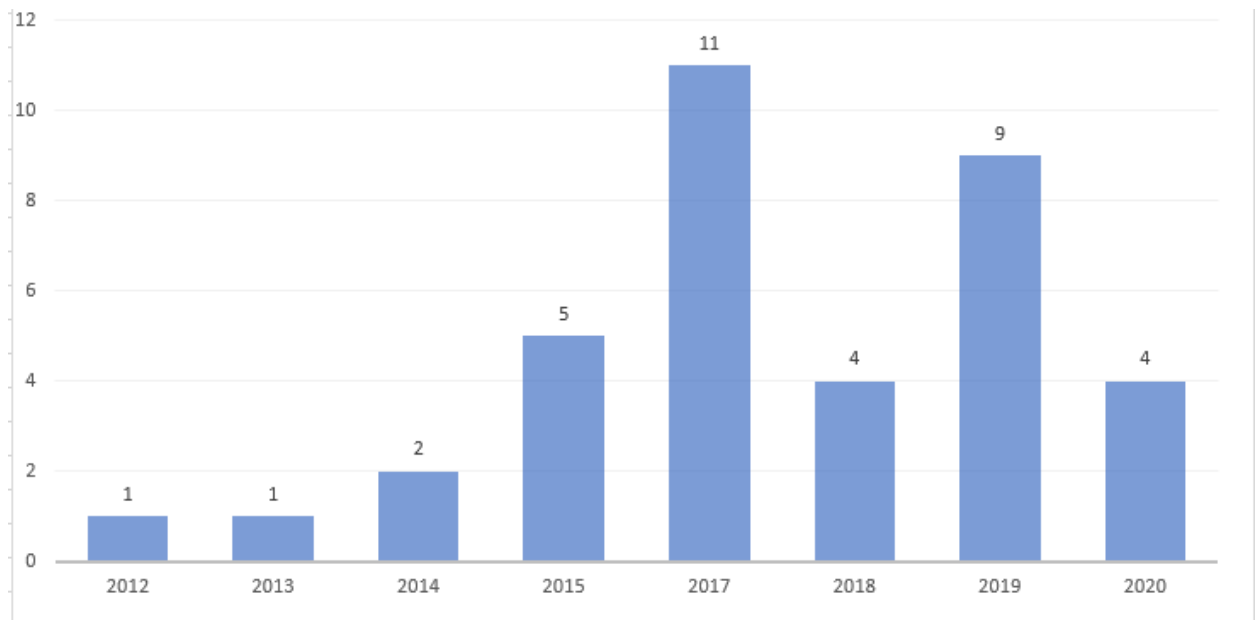


Fig. 3. Number of publications per year from 2012 to 2020.

4.3. Review of relevant theories

This section reports on the adult learning theories that were used in the papers selected in our review. While some of the papers did not use any theories at all, the following theories were the most commonly used:

- Social capital theory: the central premise of this theory is that relationships are a critical resource for the members of the community, and individuals benefit from being associated with the community (Kumi et al., 2018;).
- Andragogy (Knowles, 1980): andragogy theory was proposed to address adult learners' individual needs (Marcaletti, Iñiguez Berrozpe and Koutra, 2018; Cocquyt and Zhu, 2018; Abu Bakar et al., 2017; Arghode, Brieger and McLean, 2017). Andragogy starts by recognising the differences between adults and youngsters and describes learning experiences from there. For instance, adult learning experiences are generated with the assumptions that adults come to the table with their own set of life experiences and motivations. They can direct their own learning, tend to learn better by doing, and will want to apply their learning to real-world situations (Merriam, 2010).
- Social learning theory: an underlying concept of this theory is that engagement in social practice is the process of how we learn and become who we are (Hafeez, Foroudi, Nguyen and Gupta, 2018).
- Personal investment theory: this theory is interested in answering the questions when and why do individuals invest time and energy in a particular activity (Torres and Beier, 2019).
- Adult learning theory: adult learning theory provides a useful framework in which to explore learning and information exchange among individual adults to help inform their best practices (Velardi, Leahy, Collum, McGuire and Ladenheim, 2020). Adult learning theory provides a framework of aspects and considerations of learning process but remains open and to accommodate a variety of different learning philosophies and theories, ranging from the behavioral over the cognitive to the constructivist, organisational and social (Kleinke and Lin, 2020).
- Self-determined learning (heutagogy): The theory of self-determined learning is described as an extension to andragogy (Agonács, Matos, Graf and O'Steen, 2020). Therefore, self-determined learning incorporates andragogy principles, but it essentially differs from it. Unlike andragogy, heutagogy is evidence-based, being grounded in studies in neuroscience on the process generated in the brain during the learning experience.

4.4. Characteristics of adult learning in Online Communities of Practice

OCOPs have formed an important online learning setting for adults. Indeed, much of this online learning is inseparable from wider patterns of engagement in these communities. However, such learning practice is fundamentally different from learning in formal settings, such as professional certification programs, because it is not coordinated by an instructor and does not include fixed learning materials. Generally, the aim of andragogy is to tell us more about the characteristics of adult learners than about the nature of learning itself, however, for adults, engaging in OCOPs is highly selective (Merriam, 2010). Namely, adults engage in OCOPs, to achieve their own personal goals and objectives through using their own methods and means. Most of the studies, however, focus on how adult learners' characteristics are defined and how their learning outcomes are affected (Jung et al., 2018). Due to the fact that adults' engagement in OCOPs involves various aspects, a comprehensive understanding of the characteristics of adult learning is needed to develop a sound strategy that will keep the adult learners engaged in OCOPs and persistent in the learning process.

The frequency of the use of an adult learner's characteristic in the selected studies varied depending on the subject area and the time period that is being analysed (see Appendix 4 for a detailed categorisation of adult learning characteristics using andragogy theory). Terms relating to the professional-centred, self-directed, and experience-centred, problem-centered, and lifelong learning principles were identified as the most frequently used in these papers.

The self-directed characteristic refers to adult learners' independent ability to drive their learning in OCOPs (Chu et al., 2012). According to Cocquyt et al. (2019), adult learners are self-directed, life-centred and possess an intrinsic motivation to learn personally relevant skills. Thus, adults tend to seek more autonomy and self-directness in their learning activities (Kleinke and Lin, 2020). Likewise, Hashim, Tan and Rashid (2014) argue that most adults are independent in choosing activities in their learning practice and tend to take a practical learning approach. Moreover, Dupin-Bryant (2004) shows how adults select the style of their learning practice in OCOPs. Researching the same subject matter Beach (2017) finds that, active adult learning is strongly related to the transformation of the individuals' own experience to attain new knowledge.

This study gave rise to the experience-centred characteristic states that adults use their own experience as the central learning resource to gain new knowledge in OCOPs (Beach, 2017). Then according to Guan and Frenkel, (2018), adult learners obtain important information by transforming past experiences and reshaping them to solve a new problem. Likewise, Cocquyt et al. (2019), point out that adult learning mainly occurs while reflecting on an action, that is learners act on prior experience to discover new knowledge. Moreover, Salavstru (2014) argues that knowledge comes from old experience that will be compared against new experiences in adult learning. Kleinke et al. (2020) adds that adults have more experiences, both in number and in diversity, to draw from in their learning

processes. Notably, this difference in the quality and quantity of prior experiences can be both a resource for and a hinderers to adult learning. In other words, the experienced-based characteristic emphasis that adult learning is a continuous and lifelong practice in which a person goes through a process of transforming a vast range of past experiences into new knowledge.

The professional-centred characteristic reflects adult learners' push towards a better professional future, either in terms of improving job satisfaction (Guan et al., 2018; Kang et al., 2016; Lounsbury et al., 2007) or in obtaining new skills (Abu Bakar et al., 2017) through engaging in OCOPs. It was found that adults learn very well in settings in which they can apply their past knowledge and experience (Johnson, 2001). Moreover, Dimitrescu, Sârbu and Lacroix (2014) emphasised that adult learning is often a pathway to upgrade one's career or change one's lifecycle. This pathway includes engaging in OCOPs to obtain knowledge and gain access to new learning materials. Importantly the process of professional-centred learning also activates human potential and can empower individuals to engage in the community of practice (Baptista, 2011).

The problem-centred characteristic emphasises the problem-oriented focus in adult learning in comparison with subject-centred younger learners (Cocquyt et al., 2019; Knowles, 1980; Marcaletti et al., 2018). As we mentioned above, adults' self-directed ability is developed through engaging in solving problems. Adults solve real-world problems by using their past experiences (Watson, 2018). In other words, they learn how to utilise these experiences and apply them to new problems (Cercone, 2008; Ioannou, 2015; Seale and Cann, 2000). Furthermore, Salavsatru (2014) described adult learning practice flow as a conceptualisation process. He showed how adult learners are willing to develop new knowledge by learning new skills because it helps them solve a real professional problem in life. Adult learners seek to be actively involved in the learning process and to directly apply their gained experiences in a practical problem (Kleinke et al., 2020), engaging in the learning process when they perceive information presented in a real-life situation (Velardi et al., 2020)

There are several different terms around the concept of lifelong learning, and some of them are seeing increasingly frequent usage (Erdei and Teperics, 2014). These include life-centred learning (Morris, 2019), life-long learning (Cocquyt et al., 2019; Boeren, 2017) and life-wide learning (Marcaletti et al., 2018). Dimitrescu et al. (2014) argued that as the lifecycle of professionalism is prevalent throughout most of human life, lifelong learning is a new and crucial theme for adult learning characteristics. In addition to this, lifelong learning is the process of activating an adult's potential to collaborate in an OCOP by a supportive process to gain knowledge, values, and skills (Baptista, 2011). In support of these findings, Tonseth (2014) reported that learning could not be limited to a specific phase of life, and adult learning is spread throughout one's lifetime. This means there is no fixed duration for learning, and it can start as early as childhood and end at a person's deathbed.

4.5. Facilitators and hinderers of adults' engagement in OCOPs

Based on the systematic literature search on adult learning in OCOPs, facilitators and hinderers of adults' engagement in OCOPs were identified and placed in a table (Appendix 5) with their corresponding impact on the learning processes. Most of the selected papers reported facilitators and hinderers of adults' engagement, in either a positive or negative manner.

Several hinderers emerged impeding online adults' engagement in OCOPs. One of them was aging. Marcaletti et al. (2018) and Abu Bakar et al. (2017) reported that age affects adults' engagement by changing the learning process. Therefore, ageism is a barrier for engagement due to the slowing down of learning activities. Also, Smythe and Breshears (2017) reported that adults might struggle with the necessary technology for engaging in OCOPs. Even if they have a computer and an Internet connection, they may still require help with their everyday online engagement needs. In addition to this, Abu Bakar et al. (2017) mentioned that adults' busy lives could leave them too tired to engage in OCOPs. The researchers (Abu Bakar et al., 2017) also highlighted that adults may resist engaging if their learning processes are directed by others. Moreover, Kleinke et al. (2020) and Tyler et al. (2020) described the hinderer of adult's prior experiences. Namely they found prior experience decreases the level of adults' engagement in the learning process, especially, if the learning process is designed for a small group of adults with limited amounts of past experiences.

As for the facilitators which may interplay with adults' engagement, Abu Bakar et al. (2017) reported that a sense of competition with others improves adults' motivation, and consequently boosts engagement. Meanwhile, Mu et al. (2019) mentioned that micro-lectures have apparent advantages in adult learning. Adults have better self-regulation capabilities making them able to engage in learning practice by concentrating on segments based on their own needs and may adjust their learning style accordingly. Another facilitator, described by Miller, Greenberg, Hendrick, and Nanda (2017), is interactive learning settings which may facilitate engagement, ultimately enhancing the learning processes by building on the interests and needs of an adult learner. Kleinke et al. (2020) mentioned that

in the past, engaging in learning process required physical infrastructures and resources, heavy books, and attendance of scheduled events. However, learning in OCOPs requires nothing more than access to a device with Internet connection at a convenient place and time. Namely the flexibility of learning at once's time and location of choice enhances intrinsic motivation levels for adults' engagement in learning processes. Another facilitator described by Kleinke et al. (2020) is the diverse experiences that adults have while engaging in OCOPs. Notably, this difference in the quality and quantity of adult experiences engaging in an online community can be both a resource for and a hinder to adult learning. Another hinderer described by Tyler et al. (2020), is engaging in learning process design. Indeed, they have found that adults prefer participate in the production of learning experiences that are relevant and practical to their lifelong learning.

In short of the elements discovered from the literature, the following hinders adults' engagement in OCOPs: (i) ageing, (ii) tiredness, (iii) directed rather than independent learning, (iv) learning new technology, (v) lack of personal evaluation, (vi) prior experience to any new learning activity and (vii) diverse experiences. Meanwhile, the following facilitators may improve engagement: (i) competition elements, (ii) freedom to choose the content and method of learning, (iii) interactive learning settings (iv) motivation, (v) self-regulation, (vi) flexibility of learning at a time and environment of choice, (vii) diverse experiences and (viii) engaging in learning design (see Appendix 5 for a detailed categorisation of facilitators and hinderers of online adults' engagement).

5. Discussion and direction for future studies

This section elaborates on the findings by grouping the named online adult learning characteristics according to their underlying theoretical frameworks. The researchers examined the relationship between the characteristics and these andragogical constructs. The discussion concludes with reflections regarding the implications for future studies of adult learning in OCOPs, noting the gaps in the current literature. This study examined literature concerning online adult learning in OCOPs for the reasons stated earlier, specifically the need to understand adult learning characteristics in OCOPs and facilitators and hinderers interplay with adults' engagement in OCOPs.

5.1. Primary findings

In relation to the first research question, this study revealed online adult learners' characteristics in OCOPs which adhere to andragogy theory. Also, the selected papers in the systematic review reported a great variety of terms and definitions of online adult learners' characteristics in OCOPs. The most frequently stated characteristics in the studies are 'self-directed', 'experience-centred' and 'professional outcomes'. A majority of the studies also reported 'problem-centred' and 'lifelong learning' characteristics, whereas a few studies mentioned 'self-motivated' and 'goal-oriented'. Regarding the second question, some studies investigated facilitators and hinderers of adult' engagement in online settings. Of these, there was a strong trend of investigating facilitators affect adults' engagement, while just a few studies investigated hinderers.

5.2. Theoretical implications

One of the aims of this study was to provide an overview of how online adult learning has been characterised in previous research. In addition to this, the andragogical assumptions that attempt to distinguish adult learners' characteristics from other learning types is examined (Cocquyt et al., 2019). Besides the traditional andragogical principles, researchers also support the notion of lifelong learning to describe adult learning characteristics (Boeren, 2017; Cocquyt et al., 2019; Marcaletti et al., 2018; Morris, 2019;). Thanks to their accumulated knowledge, adult learners can engage in online learning activities in particular OCOPs that offer opportunities to reflect on their experience, or activities in which adults reshape their experience, obtain new knowledge and evaluate it during the lifelong learning engagement (Cocquyt et al., 2019).

This paper has extracted a category and has coined the term 'lifelong learning', which contributes to our understanding of andragogy theory in OCOPs settings. This supplementary characteristic may assist researchers by allowing them to determine the extent to which engagement can affect learning processes and improve adult learning in OCOPs. Moreover, extended andragogy can be used to develop adult learning and prepare adult learners for lifelong learning, especially in OCOPs, by capturing their perceptions of their special needs. Authors have stressed adult learners' abilities to engage in real-life problems and highlighted that the field needs further investigation to examine different aspects of their engagement in OCOPs (see Appendix 6 for the detailed breakdown of each characteristic and lifelong learning category).

Although andragogy theory has been criticised for its focus on independent learners and ignores the impact of collaborative factors on adult learners, it still provides the most articulate expression of understanding adult learners' characteristics today (Baumgartner, Lee, Birden and Flowers, 2003). According to andragogy, and as confirmed in this study, adult learning should be distinguished from the other types of learning (Pratt, 1993). The initial concept of andragogy was put forward by a German teacher, but its development into a scientific theory was the work of Knowles (Muresan, 2014). Knowles presented andragogy as a distinct theory for understanding adult learning, characterised by

the learners' responsibility for making decisions related to their personal and professional interest. At the root of the theory lies a set of adult learners' primary characteristics: a tendency to adapt learning concepts according to past experiences; the self-directed nature of their learning; their tendency to increase their own motivation level; a pragmatic approach concerning the immediate use of the knowledge, and a focus on solving practical issues (Cercone, 2008; Huang, 2002; Ismail and Azman, 2010; Salavastru, 2014; Marcaletti et al., 2018; Cocquyt et al., 2018; Abu Bakar et al., 2017; Arghode et al., 2017).

The contribution of this paper lies partly in its approach to defining adult learning in OCOPs. As stated earlier, there is a need to concentrate on adult learning which should be distinguished from other learning types (Pratt, 1993). Adult learning embraces both individual and collaborative learning activities and extends into lifelong learning. Another central contribution lies in the exploration of the lifelong approach to adult learning which one of the studies neatly described in the following manner: Lifelong learning is primarily the definition of adult learning by grouping multiple activities leading to learning for adult learners (Christidou, Hatzinikita and Gravani, 2012). However, as this study shows, the approach to such lifelong learning is very much related to the adult learning characteristics, notably with exposure to engagement being related to personal goals or professional development in OCOPs. To sum up the argument, this paper, proposes that the lifelong concept developed through spiralled circumstances contribute to defining adult learning in OCOPs.

5.3. Practical implications

The growth of OCOPs following the outbreak of the pandemic is shifting adult learning to more decentralised and experience-centred processes (Pesare et al., 2017; Pan and Zhang, 2020). Given the centrality of individuals in adult learning (Knowles, 1980), and the important role of information exchange in OCOPs (Wenger et al., 2002), it is essential to re-establish characteristics of adult learning and evaluate any differentials of adult learning in OCOPs from traditional settings. OCOPs will continue to grow in importance for adult learners. Many adults need and desire to be engaged in these communities to collaborate with other members. Online engagement is a fundamental part of the online communities' existence. Therefore, understanding and evaluating the facilitators and hinderers of adults' engagement in an online community of practice is crucial. For example, prior research on the aging element has focused on the declining speed and efficiency of skill acquisition, but there is no comparable study found in adult learning (Livingstone, 2006) to date for online settings in particular. Studies examining actual adult learning are much needed to overcome stereotypes of decline and to understand the interaction of cumulative experience and learning new skills (Livingstone, 2006). Hence, much further research is still needed to generate the characteristics of adult learning more clearly.

Our paper not only expands the andragogical theory but also provides practical implications for adults' engagement in online communities of practice's practitioners, and any adult who is willing to participate effectively in these communities.

The comprehensive andragogy theory introduced in this paper attempts to equip practitioners and individual adults with an exhaustive representation of adult learners' characteristics in OCOPs. The extensive number of published materials shows that the importance of adult learning has significantly increased in recent years. Accordingly, by reviewing the recent studies on adult learners' characteristics in OCOPs and providing findings, this study aims to provide practitioners with new insights into more effective use of OCOPs specifically for adult learning.

There is a need to reframe the way lifelong learning via OCOPs is defined, to account for adults' needs more effectively, where individuals are better engaged to share their experiences that are valuable to them and connects them with their peers to build sustainable online communities. Adults are also encouraged to engage in OCOPs more actively, as this process can increase opportunities for knowledge sharing, engaging in collaborative activities and sustaining these interactions. The current study, therefore, tried to examine and provide an understanding of facilitators and hinderers of adults' engagement in OCOPs. Through this investigation, the authors provide basic design strategies to effectively facilitate adults' engagement in OCOPs beyond the introduction stages. These research findings can provide practical recommendations for how to design or support diverse adult learners with the features of the OCOPs.

5.4. Direction for future studies

Adult learning in OCOPs depends upon exchanging past experiences that reshape and extract new knowledge (Smythe et al., 2017). These experiences can be exchanged between online community members in a direct or indirect way using OCOPs capabilities. There is a surprising lack of studies on how these experiences should be integrated into adult learning processes in online settings. Our study has aimed to address this gap and came up with a set of facilitators and hinderers that can be used in future studies for quantitative analysis of their impact on adults' engagement in online communities of practice.

There is also a dearth of research on how exploring past experiences can be beneficial in the adult learning process engaging OCOPs. Future research should focus on examining the effects of adult learning, with sets of methods and

tools being prescribed for OCOPs, and members' interactions. Furthermore, more research is needed to clearly establish the impact of engagement in OCOPs on learning processes.

6. Conclusion

In conclusion this paper has reviewed the recent studies on adult learning in OCOPs. In total, 37 studies were selected based on predefined selection criteria, and examined to collect data about the research's questions. The first aim of this review was to identify adult learners' characteristics in OCOPs. The results showed that adult learners are independent, self-directed, experience-centred and problem-centred, self-motivated and goal-oriented, with the main prospect of achieving a relevant professional outcome. We also distinguished a category, lifelong learning, from the review. This may be used to extend the andragogy theory and further investigate adult learning in OCOPs. This classification also allows researchers to identify the various aspects of the adult learning process and activities ultimately being able to differentiate adult learning from other learning types by allowing relative recognition and understanding the importance of lifelong learning practices.

In the process of undertaking this review, the authors identified some studies that reported what facilitates adults' engagement in OCOPs, although only very few studies were found focusing on what hinders these phenomena. Crucially, the use of certain new online settings may become a new norm for adults, not only because of the unpredictable duration of the COVID outbreak (Pan et al., 2020) but also due to individuals' adaptation to and preference for these new engagements with OCOPs.

Finally, our findings are subject to limitations because of our restrictions with respect to year of publication, keyword search and English-only publications. Moreover, by focusing on adult learning and OCOPs, we excluded some popular studies directly related to offline settings and adult education.

7. Statements on open data and conflict of interest

Since this is a systematic literature review, there is no data to be shared. The list of selected papers is presented in Appendix 7. There is no potential conflict of interest in this study.

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