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# Virtual Communities of Practice for Faculty and Staff in Higher Education: A Systematic Review of the Literature

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**Abstract:** In March 2020, in response to a global pandemic, a Canadian polytechnic moved to online learning and a virtual community of practice (vCOP). The vCOP, known as the Digital Learning Exchange (DigEx), was created to support faculty and staff in this transition. As a preliminary step in researching the efficacy of the DigEx, this systematic literature review examines recently published literature that examined vCOPs in higher education over the last five years. The studies reviewed all occurred before or during the COVID-19 global pandemic and serve to capture the impact of vCOPs during this time of transition. Several aspects of the vCOPs studied are identified and compared including the defining characteristics of the communities, the digital tools used and the rationale for their selection, the positive impacts of using these digital tools, the barriers created by applying the technology, and the benefits experienced as a result of faculty and staff participating in vCOPs.

***Keywords:*** Communities of Practice; Virtual Communities of Practice; Higher Education; COVID-19; Professional Development



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# Communautés de pratique virtuelles pour le corps enseignant et le personnel de l'enseignement supérieur : Une revue systématique de la littérature

**Résumé:** En mars 2020, une école polytechnique canadienne est passée à l'apprentissage en ligne et à une communauté de pratique virtuelle (vCOP) en raison de la pandémie. La vCOP a été créée pour soutenir le corps enseignant et le personnel dans cette transition. L'école polytechnique a baptisé son vCOP Digital Learning Exchange (DigEx). En guise d'étape préliminaire à la recherche sur l'efficacité du DigEx, cette revue systématique de la littérature examine la littérature publiée sur les vCOP dans l'enseignement supérieur au cours des cinq dernières années. Les recherches analysées se sont toutes déroulées avant ou pendant la pandémie mondiale de COVID-19 et permettent de saisir l'impact des vCOP pendant cette période de transition. Plusieurs aspects des vCOP étudiés sont identifiés et comparés, y compris les caractéristiques définissant les communautés, les outils numériques utilisés et les raisons de leur sélection, les impacts positifs de l'utilisation de ces outils numériques, les barrières créées par l'application de la technologie, et les avantages ressentis suite à la participation du corps enseignant et du personnel aux vCOP.

**Mots clés :** Communautés de pratique ; communautés de pratique virtuelles ; enseignement supérieur ; COVID-19 ; développement professionnel

## Introduction

In March 2020, a global pandemic was declared, and institutions all over the world moved from face-to-face learning to online learning in what felt like an instant. The Southern Alberta Institute of Technology (SAIT), a then 104-year-old polytechnic, located in Calgary, Alberta, Canada was no different. SAIT suspended all in-person classes on March 14, 2020, and announced that classes would resume online on March 19, 2020 (Janes & Carter, 2020a; Janes & Beres, 2022). To support the faculty and staff in their shift to online learning, educational developers at SAIT created a virtual community of practice (vCOP) which they named the Digital Learning Exchange (DigEx) two days after the shutdown of the institution due to the pandemic (Janes & Carter, 2020b).

Thirty months later, the SAIT vCOP remains a strong source of connection with 718 faculty and staff members in the DigEx (Janes & Beres, 2022). To examine and understand this vCOP, the authors created a research team. This research team explored the efficacy of the vCOP model of faculty and staff support, and the question of how this vCOP, created to support online teaching in an emergency, survived the return to in-person teaching in 2022.

To that end, this systematic review was undertaken to examine in detail the current literature on vCOP in support of our DigEx research project and paper to be published in the future (Janes & Beres, 2022). A systematic review methodology was selected because it has several benefits. These benefits include a clear and comprehensive overview of available evidence related to a specific research area, and identification of gaps in current research and collective understanding in the research area. Additionally, systematic reviews can improve future work in the research area by highlighting methodological concerns in the current body of research. The final benefit of the systematic review

methodology is that it can identify research questions that have already been answered with sufficient evidence; thus, indicating that further research is unnecessary (Poklepović Peričić & Tanveer, 2019). The authors of this work chose to assist in setting the stage for follow-up research currently underway on a digital community of practice created by an organization they are both familiar with, which started in March 2020 in response to the global pandemic (Janes & Beres, 2022).

Researchers have made a few attempts in the past to undertake critical reviews of the existing body of research literature about virtual or online communities of practice in the higher-education industry for the purpose of providing a comprehensive overview of the topic. The first of these identified by the authors is Johnson's (2001) survey of 15 published case studies of higher-education online communities of practice. This survey examined online communities of practice as a new development in the use of web-based technology to facilitate communities of practice. There were not any further literature reviews on the topic until Tight's (2015) review, which examined communities of practice as a whole, but did identify online communities of practice as a distinct area of research. The most recent reviews include Abigail's (2016) systematic review, which examined whether communities of practice, both online or face-to-face, supported faculty development and Golden's (2016) review which examined vCOPs in the context of supporting online faculty. The authors did not identify any literature reviews that cover the time period just before and during the COVID-19 pandemic.

This review aims to provide a comprehensive and up-to-date study of the research literature about using vCOP with faculty and staff in the higher education environment. It seeks to answer the primary research question: What research was conducted between January 2017 and June 2022 that examined vCOPs involving faculty and staff in higher education? The following questions support this overarching question:

1. *What types of employees were involved in the vCOP?*
2. *What digital tools have been used in the vCOPs researched?*
3. *What factors led to the selection of the digital tools used?*
4. *To what effect were the digital tools used?*

# Theoretical Context

## Communities of Practice

Communities of practice (also known as CoPs) were named in the early 1990s by Jean Lave and Etienne Wenger (Lave & Wegner, 1991). As cognitive anthropologists, they examined the use of apprenticeships (novices and experts) as a model of learning in which "…the community acts as a living curriculum" (Creating Communities of Practice, 2016, para. 4). Over time, it became apparent that communities of practice existed in many forms and did not require the concept of apprenticeship to be present. As Li et al. (2009) noted, Lave and Wegner's ideas "…had shifted to personal growth and the trajectory of individuals' participation within a group (for example, peripheral versus core participation)". The focus changed again in 2002 when a community of practice was applied as a managerial tool for improving an organization's competitiveness (Li et al., 2009, para. 3). As Wenger (2010) wrote:

> *The concept of community of practice was not born in the systems theory tradition. It has its roots in attempts to develop accounts of the social nature of human learning inspired by anthropology and social theory (Lave, 1988; Bourdieu, 1977; Giddens, 1984; Foucault, 1980; Vygotsky, 1978). But the concept of community of practice is well aligned with the perspective of systems traditions. A community of practice itself can be viewed as a simple*

> *social system. And a complex social system can be viewed as constituted by interrelated communities of practice* (Wenger, 2010, p. 179).

Wenger goes on to note that communities of practice are not alone in their existence, but rather a part of social learning, a "…relationship between the person and the world" (Wenger, 2010, p. 179).

In its most basic form "…the three crucial characteristics of a CoP are that the members (a) share competence in a domain of interest that distinguishes themselves from others, (b) help one another learn and learn from each other as they interact through discussion and joint activities in their community on a regular basis, and (c) are practitioners who develop a shared repertoire and understanding of their practice and ways to address problems that occur in their practice" (Abbott & Lee, 2022, para. 4). Founded via social constructivism, the co-creation of knowledge and practice is a collaborative and negotiated idea which takes place over time (Abbott & Lee, 2022; Wegner, 2010).

## Virtual Communities of Practice

Initially communities of practice formed *in-person*; however, the growth of the vCOP or Virtual Communities of Practice, happened pre-COVID-19 as the move to online learning and professional development gained traction. During COVID-19 and as the endemic approaches, vCOPs have gained popularity in a variety of models, disciplines, and for a number of uses.

As Wegner, McDermott, and Snyder suggested, "[a] community of practice is not just a Web site, a database, or a collection of best practices. It is a group of people who interact, learn together, build relationships, and in the process develop a sense of

belonging and mutual commitment. Having others who share your overall view of the domain and yet bring their individual perspectives on any given problem creates a social learning system that goes beyond the sum of its parts" (Wegner et al., , 2002, p. 34).

Ghamrawi (2022), proposes that vCOPs share similar intentions and structures with more traditional communities of practice that were face-to-face in origin. Further, there are three factors of technology that are critical in the participation and longevity of vCOPs: the amount of anxiety related to technology experienced by the individual, the level to which a platform is user friendly, and the level and quality of technical support offered to the vCOP (Ghamrawi, 2022, para. 24).

## Systematic Review Methodology

A systematic review (Bearman et al., 2012) was performed to answer the research questions with respect to vCOPs. Two databases (Scopus and Academic Search Ultimate) and two search engines (Google Scholar and Lancaster University Library's OneSearch), were used for searches.

The databases were queried using a highly selective search strategy (HSSS) to increase the likelihood that all relevant articles were identified. An HSSS employs strategic database search capabilities by using:

- Brackets to define search strings that are performed first and completed in sequence
- Boolean operator terms (AND, OR)
- Quotation marks ("…") to ensure that the search includes all words in the phrase and words in their correct order
- Proximity/adjacent operator terms to identify terms that are within a set number of words apart from each other

- Asterisks (*) to replace letters at the end of a term to include both singular and plural spellings

This search approach effectively increases the number of results returned within the database, as compared to simple Boolean search strategies. However, increasing the number of results also increases the likelihood of irrelevant articles being included. A detailed, thorough review of the search results is therefore needed before beginning analysis. For the two database searches, a proximity/adjacent operator of five words between the phrase "community of practice" and the terms "digital", "online", or "virtual" was used.

Because both Google Scholar and OneSearch have limited use of specialized operations, they were searched using keyword and phrase strings along with simple Boolean operators and punctuation operators, such as quotation marks and the minus sign (-), to eliminate specific words from the search results.

Table 1 lists the HSSS search strings used in the two database searches, and the general keywords and phrases used in the two search engines. In addition to the HSSS and general keyword or phrase searches, filters and limiters within the search tools were used to return results that included only peer-reviewed articles published in academic journals between January 2017 and June 2022. This narrow date range was selected because it covers the period in which vCOPs transitioned from their initial applications, as identified in previous literature reviews, to being impacted by the COVID-19 global pandemic. The inclusion of pre-pandemic studies is purposeful; it serves to capture examples of pre-pandemic practices.

**Table 1**

*Systematic Review Databases, Keywords, and Phrases*

| Databases & Search Engines | Keywords & Phrases |
|---|---|
| Scopus | • ((virtual OR digital OR online) W/5 ("Community of Practice") (higher AND education OR university OR college) (faculty OR teacher OR instructor*) (staff OR employee))<br>• ((virtual OR digital OR online) W/5 ("Community of Practice") ("higher education" OR university OR college)) |
| Academic Search Ultimate | • ((Virtual OR Digital OR Online) N5 ("Communit* of Practice") (Higher Education OR University OR College) (Faculty OR Teacher* OR Instructor*) (Staff OR Employee*))<br>• (virtual OR online OR Digital) N5 "communit* of practice" AND ("higher education" OR college or university OR "post secondary" OR postsecondary) |
| OneSearch | • "Higher Education" Virtual Faculty<br>• "Digital communities of practice"<br>• "Virtual communities of practice"<br>• "Virtual communities of practice" "Higher Education"<br>• "Virtual communities of practice" "Higher Education" Faculty |
| Google Scholar | • "Virtual Communities of Practice" "Higher Education" Faculty<br>• "Virtual Communities of Practice" "Higher Education" Faculty - student<br>• "Digital communities of practice" Higher Education Faculty |

*Note.* Search timeframe = January 2017 to June 2022

To determine if the identified articles provided relevant data to answer the research questions, inclusion and exclusion criteria were identified. Because the primary research question is directly related to faculty and staff working in higher education, the inclusion criteria included peer-reviewed research examining vCOPs involving institutional staff in higher education. Further to this focus on higher education staff, vCOPS which involved

students or external stakeholders were excluded from this review. The inclusion and exclusion criteria are listed in Table 2.

**Table 2**

*Systematic Review Inclusion and Exclusion Criteria*

| Inclusion Criteria | Exclusion Criteria |
|---|---|
| • Community of practice was created in the higher education environment<br>• Community of practice involves a virtual, digital online, or mobile modality<br>• Community of practice includes faculty and staff<br>• Article is original research or case-study<br>• Peer-Reviewed | • Community of practice includes students, community, or industry stakeholders<br>• The article is not in an academic journal<br>• The article is an opinion piece or literature review<br>• The article was published before January 2017<br>• The article is not in English |

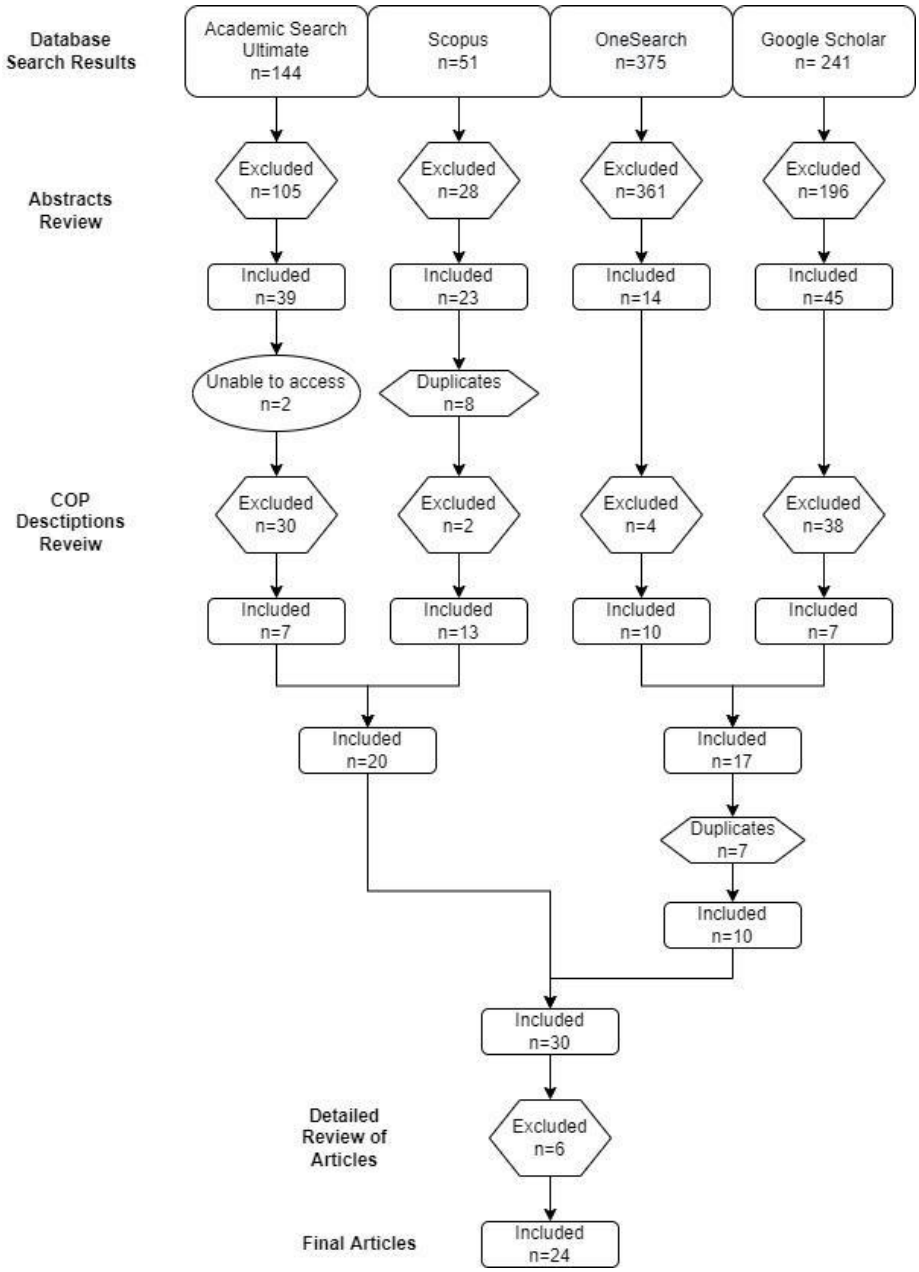
Applying these criteria, the articles were evaluated in a three-stage process to determine if they would be included in the analysis. The first stage involved reading the article abstracts to determine if the inclusion criteria were met and if any of the exclusion criteria were present. Articles with abstracts that met the inclusion criteria and did not have any of the exclusion criteria present were then moved to the next stage. In the second stage, the remaining introductions and methodology sections in the articles were read to find descriptions of the communities of practice studied in the research. If the communities of practice described met the inclusion criteria and did not contain any exclusion criteria, they were selected for inclusion in this systematic literature review. In the final stage, the included articles were read in detail to ensure they met the inclusion criteria without exclusion criteria present. Those remaining were included in the final review.

Duplicate articles were identified in three stages in the review process. First, articles identified in both Scopus and Academic Search Ultimate had the duplicate version removed from the total count of included articles. Next, duplicates were identified in the OneSearch and Google Scholar results, and were removed from the total. Lastly, a final review of all included articles was conducted, and the remainder of the duplicate articles were removed.

Figure 1 provides a diagrammatic representation of the complete literature search and systematic review process.

**Figure 1**

*Diagrammatic Representation of the Literature Search and Review Process*




[Figure 1 Long Description]

## Qualitative Analysis and Findings

### Coding Methodology

Once all the articles that met the inclusion criteria were identified, a thematic analysis was conducted to answer the primary and supporting research questions. A two-stage approach was used to code the qualitative data found in the articles. A deductive approach was initially used to establish the thematic codes before beginning the analysis. These thematic codes were descriptive in nature and used to identify characteristics of the vCOPs included in the articles. The descriptive codes used were "vCOP participant type," "digital platform used for the vCOP," "benefits realized by the vCOP," and "challenges encountered when creating the vCOP."

The second coding stage involved an inductive process, in which the data coded in the first stage was reviewed, and distinctive data groups were coded as child codes to the initially identified code. The initial code group, "vCOP participant type," illustrates this. Upon reviewing the data initially coded within this group, five distinct groups were identified. These child codes included "full-time faculty," "adjunct faculty," "academic librarians," "non-academic staff," and "no specific role identified." All coding was accomplished using Nvivo Plus, a qualitative analysis software that allows documents to be coded and themed. This coding process allows for detailed answers to the supporting research questions. The findings are outlined below.

### Types of Employees Involved in the vCOP

The vCOPs examined in the research included participants in various roles within their institutions. The majority, 16 in total, were composed solely of faculty, both full-time and adjunct, while the others were composed of other higher education staff groups. Every article reviewed did not provide the number of vCOP participants. Of those articles

that did provide the number of vCOP participants, there was a wide range, ranging from as few as three (Tham et al., 2022) to over 300 (Yang et al., 2020).

Amongst the faculty vCOPs, two were composed of only adjunct faculty (Cottom et al., 2018; Sprute et al., 2019). The other employee groups included learning developers (Bickle et al., 2021), academic librarians and library staff (Carroll & Mallon, 2021; Grant & Organ, 2020), and teaching assistants (McLaughlan, 2021). Only four of the vCOPs studied had a mixture of faculty and non-academic staff (Corcoran & Duane, 2018; Eaton & Pasquini, 2020; Harvey et al., 2021; Yang et al., 2020).

### What Digital Tools Have Been Used in the vCOPs Researched?

A wide variety of digital tools or platforms were used within the vCOPs. These included social media platforms, learning management system (LMS) software, multi-platform instant messaging applications, synchronous web conferencing platforms, a web-based communication and collaboration platform, a blogging platform, document collaboration and file-sharing platforms, and asynchronous web platforms. Often the vCOPs leveraged more than one digital tool to meet their communication, sharing, and collaboration needs. Table 3 presents a detailed breakdown of the platforms used.

**Table 3**

*Digital Tools Used in Virtual Communities of Practice*

| Type of Digital Tool | Digital Tool | Citations |
|---|---|---|
| Social Media Platforms | Yammer | Corcoran & Duane (2018) |
| | Twitter | Eaton & Pasquini (2020), Grant & Organ (2020), Harvey et al. (2021) |
| | Linked-In | Harvey et al. (2021) |
| | WeChat | Xue et al. (2021) |
| | Google Communities | Borkoski & Prosser (2020) |
| | Facebook Group | McLaughlan (2021) |
| Learning Management Systems | Canvas | Cottom et al. (2018), Gilmore (2021) |
| | Blackboard | Eldridge et al. (2021) |
| | Unspecified LMS | Valenti & Sutton (2020) |
| Multi-Platform Instant Messaging Platforms | WhatsApp | Filipe et al. (2021), Gachago et al. (2021) |
| | Line | Ulla & Perales (2021) |
| | Slack | Gottlieb et al. (2021) |
| Synchronous Web Conferencing Platforms | Zoom | Campbell et al. (2022), Carroll & Mallon (2021), Filipe et al. (2021), Gilmore (2021), Tham et al. (2022), Ulla & Perales (2021) |
| | Google Meet | Ulla & Perales (2021) |
| | Unspecified Conferencing Platforms | Yang et al. (2020) |

| Type of Digital Tool | Digital Tool | Citations |
|---|---|---|
| Web-Based Communication and Collaboration Platform | Microsoft Teams | Carroll & Mallon (2021), Grant & Organ (2020), Harvey et al. (2021) , Ulla & Perales (2021) |
| Blog Platform | WordPress | Grant & Organ (2020) |
| Document Collaboration and File-Sharing Platforms | Goggle Docs | Bickle et al. (2021) |
| | Google Drive | Tham et al. (2022) |
| Asynchronous Web Platforms | Cybersite | Filipe et al. (2021) |
| | Unspecified Web Platforms | Harvey et al. (2021), Henriques & Hopkins Eyles (2021), Sprute et al. (2019) |

### What Factors Led to the Selection of the Digital Tools Used?

All of the articles did not review the explained factors that led to the selection of the digital tools used in the vCOP. The articles that did review the factors, identified five influencing factors: having geographically dispersed membership, overcoming COVID-19 restrictions, accessing specific functionalities from the tools, accessing tools already used at the institution, and having participants already familiar with the digital tool. The first two factors, having geographically dispersed members and overcoming COVID-19 restrictions, are closely related. Both of these factors involve selecting digital tools that would facilitate the vCOPs activities when it was not possible for members to meet in the same locale. The five factors listed above were rarely considered in isolation; often two or more factors were identified as deciding factors when selecting digital tools.

The distances between the geographic locations of members of the vCOPs varied. Some participants were in different colleges within a single campus (Yang et al., 2020), and some were located across multiple campuses of the same institution (Borkoski & Prosser, 2020; Harvey et al., 2021). Other participants were located in multiple institutions within a

country (Bickle et al., 2021; Gottlieb et al., 2021; Mead et al., 2021), an online faculty for a single institution located throughout a country (Gilmore, 2021), or in multiple countries (Campbell et al., 2022; Cottom et al., 2018; Filipe et al., 2021; Henriques & Hopkins Eyles, 2021).

During the COVID-19 pandemic, several vCOPs were created as a result of the shift to emergency remote instruction, the quarantine, or work-from-home mandates put in place by many local governments. As such, the vCOPs identified that they needed tools that would allow them to function while not being able to meet in person (Bickle et al., 2021; Campbell et al., 2022; Carroll & Mallon, 2021; Mead et al., 2021).

Many vCOPs sought specific functionality from the digital tools they selected in order to meet their intended purposes. This included having a dedicated online space where members could socialize and hold discussions, share resources, collaborate, meet synchronously, and share problems and solutions (Borkoski & Prosser, 2020; Corcoran & Duane, 2018; Grant & Organ, 2020; McLaughlan, 2021; Ulla & Perales, 2021). Another functionality mentioned was the ability to accommodate and navigate complex scheduling requirements through asynchronous engagement (Gottlieb et al., 2021).

The universities discussed in Eldridge et al. (2021) intentionally chose to use their institution's LMS in their vCOP to model use of the LMS and quality design practices with faculty. In the Eldridge example, two universities collaborated to design and deliver training to only one of the university’s faculty (CUNY); VCoPs organically developed as a result of (and within) the training groups (Eldridge et al, 2021). Several other vCOPs leveraged the use of their institutional LMS and other institutionally licensed digital platforms, such as Microsoft Teams and ZOOM (Carroll & Mallon, 2021; Cottom et al., 2018; Gilmore, 2021; Harvey et al., 2021; Valenti & Sutton, 2020). Although specific reasons

for this choice were not stated, it is reasonable to assume this was due to the convenience of having access to the tools without participants or organizers having to incur a financial cost to be involved in the vCOP.

The final influencing factor that impacted the selection of the digital tools was the organizers' belief that participants already had a familiarity with the tool. Corcoran & Duane (2018) selected Yammer due to its similarity to existing social media tools, such as Facebook and Twitter. Eaton and Pasquini (2020) explained that Twitter was a natural selection for the vCOP platform because initial participants had already used it during an earlier conference. The vCOP studied by Gachago et al. (2021) selected WhatsApp because the participants were already familiar with it. Lastly, the vCOP studied by Xue et al. (2021) selected WeChat because it is the most popular mobile social media app in China.

## To What Effect Were the Digital Tools Used?

The use of digital and online tools is the distinguishing feature that separates vCOPs from traditional communities of practice. As such, it is important to examine what positive effects came from using vCOPs, and what barriers, foreseen or unforeseen, were created.

### *Positive Effects*

Many positive impacts were a direct result of using digital tools that would not have been possible in a traditional community of practice. The most frequently cited benefit was that the digital tools allowed vCOPs to overcome the physical barrier created by having participants who are displaced over varying geographic locations (Campbell et al., 2022; Cottom et al., 2018; Filipe et al., 2021; Harvey et al., 2021; Henriques & Hopkins Eyles, 2021; Mead et al., 2021; Yang et al., 2020). A benefit connected to the COVID-19 pandemic was that vCOPs allowed institutions to overcome the physical restrictions

caused by illness, isolation requirements, campus closures, and work-from-home mandates (Eldridge et al., 2021; Gachago et al., 2021; Grant & Organ, 2020; Harvey et al., 2021; Henriques & Hopkins Eyles, 2021; Ulla & Perales, 2021).

Several articles stated the technology used allowed easier distribution of digital resources among participants. This sharing occurred through the creation of a resource hub using Microsoft Teams (Harvey et al., 2021), sharing documents in Google Drive (Tham et al., 2022), sharing additional tools in WeChat (Xue et al., 2021), and sharing PowerPoint presentations, links to blogs, and other helpful resources via the chat feature in Zoom (Yang et al., 2020). This digital distribution of materials also provided the benefit of being able to collaborate on documents in a way that was "time-effective and resource-efficient, compared to completing the exercise either as a verbal group discussion or individual writing" (Bickle et al., 2021, p. 146).

The technology used also supported and enhanced effective communication between participants. Being able to easily communicate with participants in synchronous and asynchronous ways about vCOP topics and events, being involved in discussions, asking questions and seeking feedback, and communicating without in-person meetings were all identified as significant impacts provided by the technology (Corcoran & Duane, 2018; Eaton & Pasquini, 2020; Eldridge et al., 2021; Grant & Organ, 2020; Harvey et al., 2021; Mead et al., 2021; Xue et al., 2021; Yang et al., 2020).

The vCOPs allowed participants a high degree of flexibility in the manner and degree of their involvement. The digital tools allowed greater flexibility, and as a result there were fewer barriers to participation (Bickle et al., 2021). Asynchronous discussions, and open-form questions and answer spaces enabled participants to choose the best times for them to be engaged (Borkoski & Prosser, 2020; Gottlieb et al., 2021). Additionally, by

recording web-conference meetings and sharing the recordings with participants, those who could not attend due to time-zone restrictions or other factors could still benefit from the discussions (Tham et al., 2022; Yang et al., 2020). Flexibility was also a benefit for one of the vCOP organizers as they could use the digital tools to ease conflicts related to scheduling events across their campus (Carroll & Mallon, 2021).

The use of digital tools, both synchronous and asynchronous, provided individual benefits for participants. Gottlieb et al. (2021) identify that "using the digital medium is also beneficial because it ensures that each participant has an equal voice, avoiding the potential for conversation domination by a small number of more vocal participants" (p. 6). Likewise, the use of breakout rooms during virtual web-conferencing allowed for small groups and created an intimacy online that fostered personal connections (Yang et al., 2020). Yang et al. (2020) found that the vCOPs provided a safe space for members participating from their homes or offices. They felt less intimidated than if they had to go to a new environment and participate in a traditional community of practice. Lastly, when working collaboratively to create a document, some participants felt more comfortable and less "judged" than they would have been undertaking the same task face-to-face as the digital tool allowed for anonymity (Bickle et al., 2021).

A final benefit identified by the studies in this review was that using digital tools to host vCOPs and store the artifacts generated created a dedicated space for the community. Disconnected from their larger institutions, participants felt they had permission to be learners in the space (Borkoski & Prosser, 2020). This online space allowed members "to share resources and ideas outside of regular meetings" (Carroll & Mallon, 2021, p. 4). However, it should be noted that this dedicated space can become a barrier if participants lose access upon leaving the institution that hosts the digital platform (Eldridge et al., 2021).

### *Barriers*

Even though the studies showed the benefits of using digital tools, they also identified barriers created by adopting a virtual environment for the vCOP. The most frequently cited barriers were related to working with the digital tools and platforms used in the vCOPs. Each digital platform has beneficial features; however, they have limitations in how they work and what they can do. Twitter has limitations in the number of characters people can use when posting, thereby limiting the amount of information that can be communicated in a single instance (Eaton & Pasquini, 2020). Other tools and platforms are not available in all regions. For example, Google applications are not available in mainland China (Tham et al., 2022). Barriers also arose when the digital tools failed to operate correctly. These difficulties involved issues with consistent and functional connections to internet service providers and system glitches when accessing platforms (Eldridge et al., 2021; Ulla & Perales, 2021).

A significant barrier identified with vCOPs was participants' digital competence and resiliency. Digital competence can be defined as an individual's "capacity of using digital technologies consciously and critically, as users in public and private life conduct problem solving, communicating, information managing, collaborating, and effective knowledge building" (Eri et al., 2021, p. 4). Digital resilience is the ability of an individual to "overcome technological difficulties and persist" (Eri et al., 2021, p. 4) when working with technology. Both were seen as barriers to overcome in the vCOPs because participants were unfamiliar with the features of the tools and did not know how to use them (Borkoski & Prosser, 2020; Corcoran & Duane, 2018; Cottom et al., 2018). This technological knowledge gap is best described by Borkoski and Prosser (2020):

> *To the researchers' surprise, members reported needing onboarding (i.e., enculturation), scaffolding, and technology training before participating in the intervention. For example, most members reported unfamiliarity with Google Drive and Google Communities and expressed difficulties with sharing files and folders needed to exchange ideas and information with other community members* (p. 50).

A final barrier encountered in the vCOPs was psychological. Borkoski and Prosser (2020) found that participants felt accountable to others, resulting in a sense of shame or guilt if they were unable to post or reply to others during asynchronous discussions. McLaughlan (2021) indicates that three participants reported feeling shy and not taking initiative in the group because they felt uncomfortable sharing with people they barely knew. While the language of communication used by the vCOP may have contributed to feelings of shyness or emotional discomfort, it was identified as a barrier to participation in only one of the studies (Filipe et al., 2021). In other vCOPs, the negative opinions of participants related to social media tools created barriers (Corcoran & Duane, 2018; Cottom et al., 2018; McLaughlan, 2021). Some participants saw "social media as something that should only be used outside of work and could not see any application for it in the workplace" (Corcoran & Duane, 2018, p. 9). Lastly, while feelings of a lack of social presence in the community were not specifically mentioned, Corcoran and Duane (2018) mention the emotional barrier of fear being a factor in the level of some members' participation.

## Conclusion

The vCOPs are knowledge-sharing communities that rely on the use of digital or online platforms as a means of communicating, collaborating, sharing, and meeting. Thus, formation of digital platforms is one way faculty and staff working in higher education

can adapt and support one another. While communities of practice have been extensively studied since Lave and Wenger first described them (1991), and research into vCOPs is an emerging area of exploration, this systematic review of the literature covers a pivotal time in the use of vCOPs. The global pandemic began in 2020 and at the time of writing was ongoing. COVID-19 was a radical disruptor for higher education institutions and how they function. It has significantly changed how people communicate, work, and connect. The studies reviewed all occurred before or during the COVID-19 global pandemic and serve to capture the impact of vCOPS during this time of transition. We believe faculty and staff rapidly adopted the available digital tools as they met the challenges faced during this time. The vCOPs that occurred during, or as a result of, the global pandemic leveraged existing digital resources, and adapted emerging digital tools to establish and maintain the effectiveness and positive outcomes that communities of practice can provide. Furthermore, while not unique to vCOPs and found in other communities of practice, the digital resources and tools served to support the emotional well-being and personal resilience of participants during the pandemic (Bickle et. al, 2021; Borkoski & Prosser, 2020; Campbell et. al., 2022; Eaton & Paswuini, 2020; Ulla & Perales, 2021).

This review has demonstrated that vCOPs are not only viable as communities of practice and a way of sharing knowledge. They also provide benefits beyond traditional in-person communities of practice, an idea we anticipate our research in the DigEx to support. As a result, we believe higher education leaders, faculty, and staff are more likely to look to technology as not just a solution to a problem but a standard option for how they choose to collaborate, share, and communicate. This will result in the creation of even more vCOPs. Furthermore, traditional communities of practice will likely begin to adopt the use of digital tools and transition into vCOPs as they combine both in-person meetings and web-based options.

The literature identified in this systematic review has examined many aspects of vCOPs within higher education. Yet, there is a need for further research on vCOPs in the context of higher education and the support vCOPs can provide for faculty and staff. Of the 24 articles reviewed, only four had diverse membership involving faculty and non-academic staff (Corcoran & Duane, 2018; Eaton & Pasquini, 2020; Harvey et al., 2021; Yang et al., 2020). Diverse membership is a hallmark of our own DigEx experience in which non-academic staff and leaders were members of the community of practice and brought expertise in testing, counselling, student support, copyright, educational technology, and more. The lack of literature in this area shows there may be a gap or barrier to forming vCOPs across employment groups. Also, academic librarians, library staff, and learning developers were the only distinct employee groups outside of faculty to be examined. Higher education institutions are composed of many more employee groups than those, including but not limited to institutional and academic leadership, registry staff, student services, and facilities teams. Therefore, there is a clear need to research other staff groups within higher education that may be forming vCOPs.

Finally, as with all research, there are limitations to this systematic review. Due to the strict inclusion and exclusion criteria used to identify research studies in this review, there may be other literature that can add knowledge relating to vCOPs. This systematic review only examined the literature published in the last five years, which ignored earlier research. A search for the terms "community of practice" and "higher education", or "college", or "university", or "postsecondary" of the Academic Search Ultimate database returned 224 articles published between 1991 and 2016. Lave and Wenger (1991) proposed the concept of communities of practice in 1991 and this systematic review began with work published in 2017. Also, literature that involved the participation of students or

external stakeholders was removed. Research that includes both these groups and higher education or staff could provide additional insights.

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**Figure 1 Long Description**

Four Database searches were completed for this Literature Search and Review Process:

Database searches for Academic Search Ultimate (ACU) and Scopus pulled 144 and 51 articles respectively. A review of the abstracts excluded 105 articles from ACU and 28 from Scopus. Two articles from Academic Search Ultimate were not accessible, and 8 of the Scopus articles were duplicates. A further filtering of the articles using COP descriptions, left the study with 7 articles from Academic Search Ultimate and 13 articles from Scopus, for a total of 20 articles included from these two databases.

Database searches for OneSearch and Google Scholar pulled 375 and 241 articles respectively. Abstracts were reviewed and 361 articles were excluded from OneSearch and 196 from Google Scholar, leaving 14 and 45 articles. After further filtering of the articles for COP descriptions, 10 articles were left from OneSearch and 7 from Google Scholar, leaving a total of 17 articles. Seven of these articles were then found to be duplicates, leaving only 10 articles included from these two databases.

After a further detailed review, 6 additional articles were excluded, and the final research examined 24 articles based on the inclusion criteria.

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