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Cultural Affordances of Twitter in Higher Education Professional Development: A Literature Review

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Abstract: Twitter has become popular among higher education academics globally as a platform to engage in personal and professional development activities. However, while researchers have studied the experiences of academics, little work has been done to understand the role of culture in these experiences, and on Twitter as a cultural artefact in the higher education space. This systematic literature review examines how Twitter is used as a space for professional development among higher education academics through the lens of cultural affordance. Using thematic analysis three cultural affordances of Twitter emerged: agency, openness, and networked scholarship. However, these affordances are not ubiquitous nor is their cross-cultural nor cross-domain generalisability determined by this study as it focuses only on research in higher education. These findings therefore point to the need for further research on cultural affordances of Twitter when it is used across different cultural contexts and professional settings. From a practice standpoint the study points to the need to carefully develop tailored policies and practices that are cognizant of cultural factors and sensitive to cultural affordances of platforms to guide professional development activities relevant to higher education academics.

Keywords: Twitter, Professional Development, Culture, Cultural Affordance, Higher Education

Introduction

The affordances with which human beings engage are cultural affordances'
*(*Ramstead, Veissière & Kirmayer, 2016*)*

Professional development is becoming increasingly important in higher education. However, though professional development is critical to career progression (Heffernan & Heffernan, 2019) it is often not adequately provided (Summers, 2017) or provided effectively (Ödalen, Brommesson, Erlingsson, Schaffer & Fogelgren, 2019). Traditionally, professional development is conducted as time-bound activities such as training courses, workshops and seminars (Ross, Maninger, LaPrairie & Sullivan, 2015). Carpenter and Krutka (2015) remarked top down professional development might lead to educators implementing the ideas of others and not develop bottom-up grassroots ideas. An argument has been made for more praxis-oriented professional development which allow educators to continuously engage each other through action and reflection (Reich, Levinson & Johnston, 2011) since it is believed to be more beneficial for participants (King, 2011). Social networks and social media, it is argued, provide an alternative space for praxis-oriented, bottom up continuous professional development (Bali & Caines, 2018; Bruguera, Guitert & Romeu, 2019; Carpenter & Krutka, 2015; Krutka & Carpenter, 2016).

Social Networks and in particular Twitter have been adopted by higher education academics (Lupton, 2014; Velestianos, 2017) to support many aspects of academic work such as professional development and networking, information sharing and learning, teaching, communication, attendance of conferences, and building communities of practice (Malik, Heyman-Schrum & Johri, 2019). Twitter in particular affords

its users the possibility of action through its various features (see Emke, 2019; Powers, 2013). Twitter provides a space where connections can be made to other users from across the globe and from different cultural and academic contexts if users are desirous of exploring connections and networking (Carpenter & Harvey, 2019; Lupton, 2014; Veletsianos, 2016; Veletsianos, 2017; Veletsianos & Shaw, 2018). Notwithstanding these positive effects, Twitter's use is not unproblematic for academics (Au & Lam, 2015; Jordan & Weller, 2018; Lupton, 2014; Stewart, 2016) as several studies have identified a range of issues that affect adoption. These include temporary disengagement because of heavy workload and not enough time to participate (Veletsianos, Kimmons, Belikov & Johnson, 2018); confidence, trust, capacity to participate fully (O'Keeffe, 2019); reputational risks, distraction, privacy (Shah & Cox, 2017); messiness of Twitter (Budge, Lemon & McPherson, 2016; Shah & Cox, 2017); noise from ongoing conversations, overlapping personal and professional contexts (Quan-Haase, Martin & McCay-Peet, 2015); low levels of interest (Li & Greenhow, 2015); hesitancy (O'Keeffe, 2016); fear being misunderstood (Ferguson & Wheat, 2010). Overall, it has been noted that much is yet to be understood about Twitter's adoption (Veletsianos, 2016) and that several issues remain unanswered, including a more informed understanding of cultural influences on participation (Bozkurt, Yazici & Aydun, 2018; Tang & Hew, 2017; Trust, Carpenter & Krutka 2017).

These challenges suggest Twitter remains a site of struggle for many in higher education. And so, the question as to whether these challenges might be culturally influenced is pertinent given that learning environments are indeed known for being sites of struggles when different cultures engage (Uzuner, 2009). It is also plausible to question the possible emergence and enforcement of dominant cultures or cultural hegemony as Gramsci (1971) describes it. Notably, there are indications already in the literature of structures that could replicate existing dominant cultural values. Veletsianos and Kimmons (2016) suggested Twitter's capacity to replicate egalitarian structures may affect participation while Ross, Terras, Warwick and Welch (2011) notes that close-knit groups may affect the participation of others. These problems are exacerbated by the fact that Twitter is a non-homogenous space with interactions among users from diverse group (Veletsianos & Shaw, 2018) which may result in what boyd (2008) calls 'context collapse' with the implication being withdrawal or reduced participation of some groups and the dominance of others.

Given Twitter's openness and its potential to support networking, connection and participation across organisation, institutional, national boundaries and cultures (Cronin, 2014; Carpenter & Harvey, 2019), it seems appropriate to examine it through the lens of culture and cultural affordances. In addition, there is paucity of research on culture and Twitter in the context of professional development as suggested by several recent systematic literature reviews (Bruguera, Guitert & Romeu, 2019; Malik, Heyman-Schrum & Johri, 2019; Tang & Hew, 2017),

The aim of this study is to raise awareness of cultural affordances of Twitter and to provide guidance for practitioners and researchers of higher education when using Twitter to facilitate professional development. In particular, this systematic literature review seeks to identify cultural affordances of Twitter in the higher education professional development context by way of an analysis of studies that reported on the use of Twitter   In particular, the following research question is addressed:

- What themes on cultural affordances emerge from the published literature that reports on the use of Twitter by higher education academics for the purposes of professional development?

Theoretical Background

The proliferation of technology and the related expansion of access to information has increased the reach of dominant cultures (Chen, Mashhadi, Ang & Harkrider, 1999) raising questions about the impact of dominant cultures on society in general and higher education in particular. However, questions about cross-cultural engagements are raised in higher education because of the potential benefits to

professional development (Hamza, 2010).   This paper explores a particular social networking technology Twitter from a cultural perspective with the aim of identifying emerging cultural affordance in the context of its use for professional development in higher education. These cultural affordances, if they exist, may offer insights into dominant cultures on the Twitter space and help academics better navigate professional development across multicultural contexts. In particular, this study draws on the cultural affordance framework proposed by Ramstead, Veissière and Kirmayer, (2016) as a lens through which Twitter is examined.

Cultural Affordance

The term affordance was developed by James Gibson in 1977 as a means to explain how the inherent values and meanings of things are perceived and linked to action (Gibson, 2000). An affordance can be thought of as a potential for a technological artefact to be used for some outcome. These potentials are often in the form of physical features and technical characteristics of an artefact (Hartson, 2003). They may also arise as a result of interaction with the artefact (Kangakhoski, 2019) and also how the object is perceived by the user (Osborne, 2014). Affordances can also be thought of as subjective qualities such as culturally based preferences (Kangakhoski, 2019; Razzaghi & Ramirez, 2009) as objects may hold different affordances for different observers depending on context and the object/observer relationship (Osborne, 2014). Since the 1980s, the affordance framework has been used extensively to study technology (Evans, Pearce, Vitak & Treem, 2016; Osborne, 2014). In particular affordances have been used to study social media (Bucher & Helmond, 2017; DeVito, Birnholtz & Hancock, 2017; Hopkins, 2016; Meese, Nansen, Kohn, Arnold & Gibbs, 2015). However, arguments have been put forward to study technology beyond the affordances of technical features by examining social and cultural dimensions and practices associated with their use (Scott, 2001; Arthur, 2009). Specific to the affordances of social media sites, boyd (2010) argues that they can be seen as 'networked publics' that affords the coming together of people for social and cultural purposes. From this perspective then cultural affordance can be considered important in the study of the use and experiences of digital environments.

To account for a cultural view of affordances of Twitter in this particular context the cultural affordance framework proposed by Ramstead, Veissière and Kirmayer, (2016) is adopted. In this framework cultural affordance is defined as a "kind of affordance that humans encounter in the niches that they constitute" and proposed two types of cultural affordance: i) natural affordance - possibilities for action dependent on the exploitation by an agent "using its set of phenotypical and encultured abilities", and ii) conventional affordance – possibilities for action "which depends on agents' skilfully leveraging explicit or implicit expectations, norms, conventions, and cooperative social practices in their ability to correctly infer (implicitly or explicitly) the culturally specific sets of expectations of which they are immersed" (Ramstead, Veissière & Kirmayer, 2016).

The authors set out to develop a 'framework to study the mechanisms that mediate the acquisition of cultural knowledge, values, and practices in terms of perceptual and behavioural affordances' with the aim to 'better understand how culture and context shape human behavior' (p.2). Though this model was developed in a naturalistic and not technology context, its conceptual foundations to 'scaffold the acquisition of socially shared representational content' (p.2) appears potentially useful to the study of a networked technology environment such Twitter. Consequently, this study adopts the cultural affordances framework to take a fresh look at Twitter with the intention of teasing out its *natural and conventional affordances* of the framework. To the best of the researcher's knowledge, there is no known study that has examined Twitter from this perspective.

Methodology

Literature Search Process

This paper follows a systematic literature review study methodology (Gough, Oliver & Thomas, 2012). The papers identified for this literature review were retrieved from the Scopus database and the following journals - Computers and Education, British Journal of Educational Technology, Internet and Higher Education, Australasian Journal of Educational Technology, Journal of Educational Technology and Society, Journal of Computing in Higher Education, The International Review of Research in Open and Distributed Learning. These journals were selected because they are known for publications relevant to educational technology and social networks in education, and are highly ranked by citation (Google Scholar, 2020). A further Google Scholar search and a snowball process supplemented these two sources.

The first search took place on October 25, 2019. The search term "*Twitter in higher education"* was used in Scopus which returned 457 articles. This search was refined using the "*AND*" operator with "*Twitter in higher education AND higher education academics" AND professional development*" and "professional development AND culture in higher education" AND "Twitter and cultural affordance". A total of returned 111 articles were returned, of which 14 were selected and the rest excluded after they were found to be not relevant when reviewed against the following inclusion criteria i) context of higher education ii) Use of Twitter for professional development by academics iii) empirical studies, iv) articles peer reviewed. A further refinement of the search string to "*Twitter in higher education AND higher education academics AND professional learning*" returned another 33 articles of which 3 were selected and 30 excluded. One further round of search using "*AND culture*" as a suffix to previous search terms (e.g. *Twitter in higher education AND higher education academics AND professional learning AND culture)* returned 23 articles but none proved relevant when examined using the inclusion/exclusion criteria. The final list of 17 articles from SCOPUS was selected after their titles were scanned and abstract to ascertain relevance. Opinions and theoretical articles were excluded.

On October 25, 2019 Google Scholar was searched using similar search terms and inclusion/exclusion criteria, yielding an additional 3 articles. On October 26, 2019, the seven selected Journals were searched by examining all of the articles in each journal from the present year publication and going back to the first year of publication by looking at the titles of each article in each volume and issue. 5 additional articles were identified from this process. Finally, the snowball search on the references of the 25 already identified articles returned 3 new articles for a total of 28 as show in Table 1.

Table 1: Sources of paper

Search Source	# articles
SCOPUS	17
Selected Journals	5
Google Scholar	3
Snowball approach	3
Total	**28**

Data Extraction and Analysis

Thematic analysis was used to derive cultural affordance themes from the papers reviewed. As a research method used for making sense of data, thematic analysis is used identify codes from chunks of data and to subsequently derive categories/themes from these codes. This study utilized the six-phase approach for thematic analysis proposed by Braun and Clarke (2006) which includes, i) familiarizing yourself with your data, ii) generating initial codes, iii) searching for themes, iv) reviewing themes, v) defining and naming themes, and vi) producing the report. (Braun & Clarke, 2006, p.78).

During data extraction each paper was read twice and relevant information recorded. Information extraction was guided by the interpretation of the natural and conventional affordances of the cultural affordance frameworks. Following data extraction, the recorded data was read twice and preliminary codes noted. Subsequently all codes were reviewed and analysed iteratively and themes were generated. Thematic analysis was used to derive themes from extracted data and followed the six-phase approach proposed by Braun and Clarke (2006). These phases are: i) familiarizing yourself with your data, ii) generating initial codes, iii) searching for themes, iv) reviewing themes, v) defining and naming themes, and vi) producing the report. (Braun & Clarke, 2006, p. 78). See Appendix A for sample of extracted data, codes and themes

Findings and Discussions

All papers reviewed are written using the English language and originated mainly from western geographical contexts (USA, UK, Canada and Australia). Only 2 of the 28 studies comprised non-English speaking participants. 6 of the 28 studies reported gender data with one attempting gender analysis. The 28 papers reviewed for this study are listed in Table 2 below.

Table 2- Papers reviewed

ID	Authors/Year
P1	(Reinhardt, Ebner, Beham & Costa, 2009)
P2	(Ross, Terras, Warwick & Welch, 2011)
P3	(Veletsianos, 2012)
P4	(Shiffman, 2012)
P5	(Lewis & Rush 2013)
P6	(Holmberg & Thelwall, 2014)
P7	(Wen, Lin, Trattner & Parra, 2014)
P8	(Quan-Haase, Martin & McCay-Peet, 2015)
P9	(Li & Greenhow, 2015)
P10	(Ferguson & Wheat, 2015)
P11	(Ross, Maninger, LaPrairie & Sullivan, 2015)
P12	(Stewart, 2015)
P13	(McPherson, Budge & Lemon,2015)
P14	(Kimmons & Veletsianos, 2016)
P15	(Budge, Lemon & McPherson, 2016)
P16	(Knight & Kaye, 2016)
P17	(O'Keeffe, 2016)
P18	(Veletsianos & Kimmons, 2016)
P19	(Parra et al. ,2016)
P20	(Ramirez & Garcia, 2017)
P21	(Shah & Cox, 2017)
P22	(O'Keeffe, 2018)
P23	(Shah & Cox, 2018)
P24	(Veletsianos, Kimmons, Belikov & Johnson, 2018)
P25	(Mohammadi, Thelwall, Kwasny & Holmes, 2018)
P26	(Albertson, 2019)
P27	(Fekete & Haffner, 2019)
P28	(Greenhow, Lai & Mai, 2019)

What cultural affordances emerge when Twitter is used for Professional Development by Higher Education Academics?

This research question is concerned with the identification of cultural affordances of Twitter when used for professional development in the higher education context. Three (3) themes emerged from the

thematic analysis: 1) Agency, 2) Openness, and 3) Networked Scholarship. The following sections detail the findings related to each of the three cultural affordances.

Agency

Twitter by design allows users to take control of the ways they use the space. All of the papers reviewed suggested that the subjects studied demonstrated the freedom to act (Cronin, 2017) or not act. This freedom is what Margaret Archer (2003) referred to as agency. This freedom to act is observable in participants sharing information about their practice by tweeting links, creating social commentary and self-reporting (P2, P3). Further, Twitter afforded users the opportunity to engage in self-promotion of their work (P4) which were shared and published elsewhere.

The continuous flow of information is often promoted as one of Twitter's great value. The data reveals that individuals used Twitter as a space to enhance their knowledge and keep up to date with new information, (P1, P2, P8, P16, P17, P18, P19, P21, P22, P24, P25, P27). However, much is not known about the content participants consumed.

Through the use of its features to facilitate group formation and connections, Twitter supported the development of professional and personal learning networks for higher education academics (P5, P23). These networks helped educators connect with fellow practitioners, support professional relationships and informal learning. However, the literature does not elaborate on the characteristics of these personal networks and professional networks.

The development and management of identity is also a common activity reported in the literature (P3, P10, P15, P16, P21) demonstrating participants freedom to shape their own identity. The curation of content was a specific strategy associated with this identity development (P10, P18, P20).

Agency is also demonstrated in action of some users who chose to take breaks or disengage from the platform for personal and professional reasons (P17, P21, P24) and set their own 'rules and philosophies' of engagement (P23). Twitter as a platform allows participants to be invisible to others even when logged in. This freedom to (not) act is demonstrated in several cases (P17, P22, P24, P27) where participants chose to lurk or remain invisible while consuming content and observing Twitter activities. This allows participants to engage without the need to connect with others.

Openness

Twitter by design facilitates open connection, sharing and communication. These design features are central to the development of the culture of openness. While there are elements of Twitter that supports private and closed communication the main features and affordances lies in its support for open educational practices (Cronin, 2017).

The evidence of this openness is reflected in all of the studies reviewed in various ways. Sharing information is one of the most common open educational practice performed on Twitted as noted in several papers (P1, P6, P7, P9, P12, P16, P17, P18, P19, P20, P21, P26, P28). In addition to content, some users shared educational practices related to teaching and pedagogy (P21, P24) and discipline-based information (P7, P8).

With the increasing use of Twitter by educators, previous research has focused on the opportunities it provides for conversations and communications across space, time and culture (P1, P6, P7, P12, P13, P17, P19). These conversations range from local to global, informal to scholarly, spontaneous to ongoing, and from generic to domain-specific engagements.

Networked Scholarship

Researchers have paid attention to the way educators have engaged Twitter to develop scholarship. One of the prominent findings from the literature highlights academics' participation in conferences through the use of Twitter as a backchannel. The backchannel is a space described by Ross, Terras, Warwick, and Welsh (2011, p.215) as an "irregular or unofficial means of communication...which can extend beyond the lecture room to engage with scholars across the community." In this review, 10 of 28 studies (P1, P2, P4, P7, P9, P14, P19, P26, P27, P28) reported on experiences using Twitter in the context of conferences. The data shows that the conference backchannel was used to share information about conferences prior to, during and after conferences conclude. Conference live tweeting was extensively used. Content about conference presenters, participants and presentations are also commonly shared. However, the literature does not provide details about the type of content shared in a majority of studies. Related links to works presented and snippets from presentations are also shared.

The backchannel provided a means for remote participants to follow conference engagements and for conference attendees and remote participants to engage in conversations (P2). In this way Twitter supports scholarly engagement by extending the reach of participation. The conference backchannel also enables participants to connect and form communities on Twitter beyond a conference (P2). However, the extent of participation among remote and onsite attendees and the level of post-conference community activities are mostly unknown (P28).

In addition to the backchannel, educators have also used Twitter to invite scholarly contributions such as journal articles and blog posts from experts (P17) and engage in intellectual debates (P12), change academic practices by proposing and engaging in practices different to offline norms (P15). Twitter was also used a source of research data (P17).

Discussion

This paper set out to explore cultural affordances of Twitter when used to support professional development among higher education academics. Three cultural affordances emerged from the literature review: 1) Agency; 2) Openness; 3) Networked scholarship. These cultural affordances are discussed below.

Agency

Agency, described as a freedom to act (Archer, 2003) has been identified in the literature as central to the development of higher education academics (O'Meara, Campbell & Terosky, 2011; Roxå & Mårtensson, 2017). Professional networks in particular have been identified as critical to the development of agency among academics and central to career development (Niehaus & O'Meara, 2015; O'Meara & Stromquist, 2015). Agency in higher education, described by O'Meara, Campbell and Terosky (2011) as "*a faculty member* assuming strategic perspectives and/or taking strategic actions toward goals that matter to him/her" (p. 1). emerged in this study as one of the cultural affordances of Twitter in the professional development context. Twitter afforded participants the possibilities of engaging in both natural and conventional affordances (Ramstead, Veissière & Kirmayer, 2016) which in particular includes: the choice of engagement/disengagement; self-promotion; knowledge acquisition; social commentary; personal network development; and identity management. These findings are consistent with findings of previous studies: connecting and networking (Veletsianos, 2016; Carpenter & Harvey, 2019); sharing information, connecting and establishing networks, promoting research (Lupton, 2014); social commentary (Veletsianos, 2012); engagement/disengagement (Veletsianos, 2017); identity management (Veletsianos & Shaw, 2018). And so, viewed through the lens of cultural affordance, this culture of agency supported by Twitter fits both natural and conventional affordance allowing academics to leverage '*possibilities for action*' through the features and functionalities natural to Twitter and by inferring implicit and explicit cultural expectations while at the same time negotiating expectations, practices and norms (Ramstead, Veissière & Kirmayer, 2016).

From this literature study, Twitter has shown potential as a space where agency can be developed and supported by higher education academics in the context of their professional development. However, Twitter's use in this context is not yet the case universally as the papers in this review covers a relatively small domain of study and not all the papers have demonstrated this affordance. Overall, while participants engagement demonstrated the choices and flexibility to decide how they use Twitter, this flexibility may present a challenge for those who without the required skill or confidence to participate. This challenge is highlighted by Bali and Caines (2018):

> *One cannot speak about ownership and agency without recognizing that participants*
> *in any learning environment each have a different sense of self-efficacy, confidence, belief*
> *in their own agency, and willingness to take ownership, whether this is based on*
> *personality, past experience of marginality or power, or intersectional identity. (p.7)*

Academics therefore need to develop the capacity for agency along several dimensions in order to fully participate and benefit from professional development and transformative learning on Twitter (Bali & Caines, 2018).

Openness
Openness, an '*umbrella term'* (p.2) that encompasses a range of open practices related to sharing (Weller, 2014), has the promise of becoming a central feature of academic professional development on social media spaces (Lupton, 2014) In this study openness emerged as a cultural affordance of Twitter revealed through the diverse range of open activities undertaken by participants such as sharing of information, practice, conversations. Specific to Twitter, these findings are similar to those reported by previous research (Malik, Heyman-Schrum & Johri, 2019; Veletsianos, 2012). Twitter openness facilitates connections and communication in a seamless manner amenable to ongoing dialogue (Junco, Heiberger & Loken, 2011) which facilitates sharing (Cronin, 2017) and empower educators (Carpenter & Krutka, 2014).

While there are many possibilities for academics to benefit from openness, there are various challenges to be overcome (Cronin, 2017; Koseoglu, 2019). Two of these challenges for academics in open spaces relates to balance between openness and privacy that academics need to address (Veletsianos & Stewart, 2016) and the overall complexity of openness as a practice in itself (Cronin, 2017). This complexity of openness as a cultural practice is highlighted by the various conceptions and interpretations of openness, their associated challenges, and the skills required to engage in open practices. Cronin (2017) highlighted four conceptions of openness (open admission, open as free, open educational resources (OER), and open educational practices (OEP), and for open educational practices, four dimensions ; balancing privacy and openness, developing digital literacies, valuing social learning, and challenging traditional teaching role expectations are identified as central to this practice. These conceptions and dimensions further highlight the complex nature of openness as a cultural practice.

From a practical standpoint, openness implies a capacity and time to engage (Bali, 2017) and access to resources that can be openly shared. This may not be the case for some academics who operate in resource-scarce environments (Peter & Deimann, 2013); do not have the language (English is a dominant language as reflected in the papers reviewed in this study) to participate (Bozkurt, Yazici & Aydin, 2018) or who may not know how to engage in open spaces (Bali & Caines, 2018). These issues are related to the balance and skewness of power that challenges the practice of openness in open spaces (Cronin, 2020).

Networked Scholarship
Networked scholarship affords academics, regardless of background or status alternative avenues and opportunities to participate in scholarly activities in networked spaces (Stewart, 2016). The cultural

affordance of networked scholarship emerging from this study is supported by previous work highlighting networked participatory scholarship (Veletsianos & Kimmons, 2012; Stewart 2015; Stewart, 2016). However, this practice is not without challenges on Twitter (Stewart, 2016) and requires scholars navigate carefully to avoid tensions and confrontations. In addition, networked scholarship in open spaces like Twitter may not align with traditional scholarly practices of universities and this may hinder its uptake if outcomes are not considered by universities (Stewart, 2015). Nevertheless, in the modern culture of measurement and metrics in the higher education space (Smith, 2017) academics can engage in networked scholarship to share their expertise to larger audiences (Koseoglu, 2019) and increase their scholarly impact on society (Stewart, 2015; Veletsianos & Kimmons, 2016).

However, to develop the competencies required for participating in networked scholarly practices, Veletsianos, Johnson and Belikov (2019) advises care to be taken to consider individual needs and preferences and external factors that affect social media usage. They urged that social media policies needs to be flexible and should account for differences among academics use of social media. This study supports this call and recommends that policies on training consider cultural factors and shifting 'current norms, practice and values' (Veletsianos, Johnson & Belikov; 2019) that impact professional development.

Social Media & Twitter Cultural Affordances
Overall, the three cultural affordances arising from this study are similar to the high-level affordances conceptualized by Bucher and Helmond (2018) but are different to the four affordances of social media (persistence, replicability, scalability, searchability) proposed by boyd (2010). Several factors may account for this difference. Firstly, this study focused on a particular social media (Twitter) and on a small aspect of its usage - professional development in higher education. This small niche may not be representative of all activities occurring on Twitter. Secondly, Veletsianos, Johnson and Belikov (2019) highlighted the changing nature of social media usage. This change can be contrasted with the affordances of persistence and replicability proposed by boyd (2010). These differences may also serve as an indication that affordances previously proposed may change depending on context (Veletsianos, Johnson & Belikov, 2019). Thirdly, Ramstead, Veissière and Kirmayer (2016) argued that some cultural artefacts themselves can have different affordances and this may account for the emergence of different typologies (Bucher & Helmond, 2018). Relatedly, Osborne (2014) suggests that objects may have affordances for a perceiver which may be different for others. And fourthly, social media technologies undergo continuous technical and policy changes and it is observed that the changes in technical features result in new affordances (Bucher & Helmond, 2018).

Conclusion, Implication, Limitations, Future Work

This paper reports three cultural affordances of Twitter related to agency, openness and digital scholarship when Twitter is used for professional development. However, these affordances may not be ubiquitous and have implications for practitioners, researchers, administrators and policy makers.

Twitter promises much to academics but requisite skills, agency, and awareness of issues and challenges are necessary to fully participate (Passey et al, 2018). To this end, Bali and Caines (2018) calls for a new approach to educational development that considers individual differences and professional development priorities. Given that Twitter was not developed for academic purposes, knowledge of its cultural affordances can guide individual and institutional professional development programs (Carpenter & Harvey, 2019). Savard, Bourdeau and Paquette (2020) suggest that an understanding of culture could facilitate how teaching and learning resources are deployed and used. Knowledge of culture can help identify cultural issues that hinders participation and also minimize culturally inappropriate practices and misunderstandings arising from cultural differences. This cultural affordance examination is especially critical as higher education educators are calling for training in

using technology to support their professional development as noted in a 2019 report (Langer-Crame et al., 2019).

This literature review suggests that Twitter is understudied from a cultural and theoretical perspectives. This gap is important to address given that though there is cultural diversity in online spaces there is also cultural dominancy (Bozkurt, Yazici & Aydin, 2018). The findings of this study suggest little is known about the effect of culture on underreported and minority groups. These groups may or may not value or place a high level of importance on networked scholarship, openness and personal agency. Further, research could examine how cultural affordances affect higher education academics on Twitter from different cultural orientations and academics in similar educational settings but of different professional levels and cultural backgrounds. This may help us understand the extent of cultural hegemony and the state of cultural dominance on social media spaces.

The study used data from a small niche area – professional development in higher education using Twitter. Further, the studies reported in the papers reviewed are conducted and published in a predominantly western cultural context. It is a possibility that the cultural affordances reported in this paper may manifest themselves differently in other domains and cultural contexts. Openness for example has been shown to vary across national cultures (De Jong, Smeets & Smits, 2006). Care is therefore suggested when inferences are made of the value of Twitter as a space for professional development from one cultural context to another. Future work could examine the universality of these cultural affordances across different higher education cultural contexts. This cultural exploration is especially critical given what we presently know from the literature are mainly written from western contexts using English language.

This present study though limited in scope is an invitation to those responsible for professional development in higher education to consider cultural affordances when they develop programmes for academics as these cultural affordances can offer guidance on how culture is played out on Twitter. This paper also issues a call to academics who pursue professional development independently to develop cultural awareness that will facilitate effective use of Twitter.

Acknowledgments

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Appendix A

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ID	Title of Paper	Author(s)	Year	Type of paper	Method/Methodology	Participants' demographics - #, affiliation, status, sample size	Usage & Overall Affordances	Successful Outcomes and Challenges (MAIN IDEAS)	Additional Notes/Limitations	Natural Affordance - PRELIMINARY CODES/ CODING 1	Conventional Affordance - PRELIMINARY CODES/CODING 2	Cultural Affordance - DOMINANT CODES	Themes
P2	Enabled backchannel: conference. Twitter use by digital humanists	Ross, Terras, Warwick & Welch	2011	Mixed Methods	4,574 "Tweets analysed using open coding, text analysis and other quantitative methods	Not mentioned	Twitter as a conference platform enables the community to expand communication beyond conf. Participants use Twitter to keep up to date. Developing networks. Professional development. Note taking/making was important use of backchannel/social reporting...	This group of conference participants are a close-knit group. Could be intimidating to newcomers.	Issues about civility in backchannel raised. Small groups of users produce most content.	Backchannel; Networking	Keep updated; Self Reporting;	Backchannel; Networking Receiving Info;	Networked Scholarship; Openness;

P3	Higher education scholars' participation and practices on Twitter	Veletsianos	2012	Descriptive/ Qualitative	Tweets from Scholars. Constant comparative content analysis - a priori codes avoided to minimize bias / limit scope of analysis. Intercoder reliability and thick descriptions used	45 scholars with research and teaching duties - have PhD, employed at HE institution. Have more than 2000 followers 100 latest tweets from 45 participants - 4500 tweets; location - U.S.A. (32), followed by Canada (6), U.K. (2), Spain (2), and Portugal (1).	(1) share info and resources, (2) shared information about their classroom and their students; (3) requested assistance from and offered suggestions to others; (4) engaged in social commentary; (5) engaged in digital identity and impression management; (6) sought to network and make connections with others; and (7) highlighted their participation in online networks other than Twitter	2000 followers suggest these are prominent scholars, perhaps well advanced in their field and influential. 100 latest tweets may not be reflective of scholars' normal use of Twitter? Some tweets translated to English from Spanish, French and Portuguese	Twitter has potential to support scholarly practice.	Sharing info, resources; Networking;	Social Commentary; identity development;	Sharing; Receiving Info; Networking;	Openness; Agency;

P11	The Use of Twitter in the Creation of Educational Professional Learning Opportunities	Ross, Maninger, LaPrairie & Sullivan	2015	Mixed Methods	Interview from 32 participants. 105 surveyed.	160 educators—105 females and 55 males between the ages of 22 and 65. Most from the USA. Some global	Use Twitter professionally to collaborate, network, and engage in professional development. Educators use Twitter to create PLNs. Discuss education issues/topics. Collaboration and networking	Anytime-Anywhere access to Twitter and its global nature makes it useful for PD.	Participants include both higher education academics and k12 teachers, admins, etc	Networking;	Collaborate; Discussion;	Networking;	Networked Scholarship
P23	Analysing the Pattern of Twitter Activities Among Academics in a UK Higher Education Institution	Shah & Cox	2018	Mixed Methods	time use analysis.	UK Academics from one institution. 28 academics from the University of Sheffield. Had registered account for at least 1 year	Academics tweet mostly during work hours and mostly 7-9 am (before arriving at work and as soon as work?). Twitter is seen mainly as a way to enrich professional working relationships. Twitter used to connect with small or large groups of people who share common interests and goals	Own rules and philosophies of using twitter set by academics.	Twitter used to connect to others. Used at pre-set times. Small scale study at one institution	Networking/Creating relationships;	Connecting;	Networking;	Agency; Networking