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Social Learning in the Digital Age: An Analyze of the Benefits of Twitter Platform from Vygotsky's Perspective

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ABSTRACT

This study examines the theoretical foundations of Vygotsky's social constructivist theory of learning and explores its alignment with using Twitter as a pedagogical tool. Utilizing a literature review methodology, the research found three key aspects in which the Twitter platform reconciles with Vygotsky's theoretical framework: co-construction of knowledge, active learning, and scaffolding. The findings reveal that Twitter positively impacts higher education by enhancing students' academic achievement, engagement, and reflective practices. Additionally, the platform promotes a sense of community, promoting feelings of belonging and connectedness among students. These findings highlight the potential of Twitter as a supportive tool in contemporary educational settings grounded in social constructivist principles. Among the main takeaways for educational practitioners, are the importance of considering students' prior Twitter experiences and providing extra resources for those without much experience in the platform, including ways to monitor their progress, along with the importance of integrating the use of Twitter in pedagogically sound manners, focusing on specific learning goals, and leading with clear rules and guidance, making expectations absolutely clear. Other important considerations are focusing on the creation of course designs that are useful for students, using strategies such as the separation of academic and personal accounts, as well as streamlined ways of accessing Twitter outlines and content in general that is posted on the platform.

Keywords: Vygotsky, Social Learning, Twitter as a Learning Tool, Higher education.

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Introduction

The use of social media platforms, such as Twitter, as a nontraditional teaching method, has increasingly grown in the higher education sector (Malik et al., 2019; Safapour et al., 2019; Tang & Hew, 2017). Social media platforms, such as Twitter, as a teaching tool in higher education have the potential to promote student motivation, encourage social interaction, and foster common actions considered to be effective for improving educational practices among higher education students (Gallardo-López & López-Noguero, 2020; Tess, 2013). The educational use of social media platforms fosters participatory learning, collective exploration, and interaction (Selwyn, 2012).

The use of Twitter in the educational context fosters collaborative learning and peer instruction by encouraging interaction among students and between students and instructors to expand prior knowledge (Chawinga, 2017; Deaves et al., 2019; Hull & Dodd, 2017; Lokman et al., 2019; Ricoy & Feliz, 2016). Twitter is used to generate ideas and share resources with fellow researchers, leaders, and experts in a field of study, letting knowledge be seen as dynamic and interactive (Gallardo-López & López-Noguero, 2020; Gleason & Manca, 2019; Loutou et al., 2018). Additionally, the effective integration of Twitter as a learning tool fosters the active role of students and has the potential to increase student engagement, learning motivation, and understanding of the learning process (Gleason & Manca, 2019; Lokman et al., 2019; Malik et al., 2019), autonomous learning (Htay et al., 2020), and informal learning (Tess, 2013). Using Twitter as a learning tool promotes scaffolding in a student's ZPD by creating opportunities to provide and receive constructive feedback in interaction with other learners (Hartshorne & Ajjan, 2009). Using Twitter as an educational tool, students collaborate on problem-solving tasks and make significant connections between previous knowledge and new knowledge (Bada & Olusegun, 2015; Palincsar, 1998; Santoveña-Casal & Bernal-Bravo, 2019; Sarita, 2017). Therefore, Vygotsky's (1978) social constructivist theory offers a suitable framework for investigating the use of Twitter to facilitate student learning through adequate scaffolding, collaborative work, and interaction among all users in the higher education setting.

Objectives

This study aimed to analyze the theoretical foundations of Vygotsky's social constructivist framework in relation to learning, investigate the applicability of Twitter as an educational tool within this theoretical perspective, and explore its potential benefits for higher education students engaging with the platform through the lens of Vygotsky's theory.

Methodology

The study employed a literature review approach, systematically analyzing academic journals, theses, and relevant books to evaluate the theoretical and practical implications of utilizing Twitter as a learning tool grounded in Vygotsky's social constructivist perspective.

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Theoretical Framework

1. The Theoretical Framework of Vygotsky's Social Constructivist Theory of Learning

The constructivist theory assumes that learners develop their knowledge meaningfully through working collaboratively with others, thus promoting a student-centered learning approach (Felder, 2012; Kivunja, 2014; Strayer, 2012). From the constructivist view, the learner-centered approach is regarded as the most significant method that fosters collaboration in which instructors' scaffold authentic tasks to support the learning process (Bada & Olusegun, 2015; Dagar & Yadav, 2016; Sarita, 2017).

According to Vygotsky's (1978) social constructivist theory of learning, constructing knowledge mainly depends on dialogue and interaction with others, using language as a medium for interaction and knowledge building (Churcher et al., 2014). Vygotsky (1978) explained that student knowledge construction cannot occur without connecting new information to previous knowledge. He also highlighted the role social interactions play in knowledge acquisition, noting that a child's cultural development happens on two levels: one at the social level and the other at the individual level (Churcher et al., 2014). A child's cognitive development is highly affected by the acquisition of cultural tools such as language, signs, and concepts (Arievitch & Stetsenko, 2000). Thus, instruction with sufficient scaffolding plays a fundamental role in the creation of new cultural tools that enhance student learning (Arievitch & Stetsenko, 2000). Scaffolding is defined as a type of aid provided by adults or skilled persons to allow a learner to fulfill a particular goal, such as offering feedback, demonstrating the content, and designing and observing learning activities (Daniels, 2001; Jonassen & Rohrer-Murphy, 1999). Scaffolding involves students exploring their learning capacities to acquire new skills by sharing their experiences and exchanging ideas with others (Jonassen & Rohrer-Murphy, 1999).

Vygotsky (1978) identified the Zone of Proximal Development (ZPD) as "the distance between the actual developmental level as determined by independent problem-solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers" (p. 86). He emphasized that when sufficient scaffolding is provided to learners in the ZPD, they will be able to succeed in a task. This means there is a certain level of cognitive development of a learner that allows him/her to advance knowledge without coaching. However, some tasks may require a higher level of understanding, thus needing some coaching.

As the zone is needed only for the purpose of completing a task, ZPD focuses on the nature of collaboration and assistance from an experienced peer in achieving a particular goal (Chaiklin, 2003; Eun, 2019). Eun (2019) details this process by explaining that at the psychological development level, less proficient students need some time to understand interactional patterns in the platform, whereas more proficient students can develop interactive features to increase awareness of the topic and encourage other learners to reflect. The instructor becomes responsible for the

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learning in this process by providing adequate support and instructions to help less competent learners succeed. As a result, instructors become guides and facilitators of learning, providing sufficient scaffolding to students who are in their ZPD (Vygotsky, 1978).

The instructor can discontinue the use of scaffolding and give learners a chance to finish the work again by themselves as they master knowledge. In mastering a task within the ZPD, learners will cooperate with peers who have different levels of proficiency (Vygotsky, 1978). This process goes well with the use of Twitter platform to create an effective learning environment in which instructors can determine collaborative work and provide individualized scaffolding of problems learners may face. The instructor must, therefore, be aware of individual differences in knowledge acquisition and facilitate the learning process accordingly (Bada & Olusegun, 2015; Sharma & Bansal, 2017). The instructor can serve as a guide, motivator, and resource person, scaffolding students to fulfill tasks (Vygotsky, 1978).

2. Twitter as a Learning Tool from Vygotsky's Perspective

Twitter is an example of a Web 2.0 tool (Mason, 2016; Thomson, 2008), which is a variety of web-based sites and applications that enable users to create and share their online information or materials (Burhanna et al., 2009; Hartshorne & Ajjan, 2009; Thomson, 2008). Twitter is a microblogging tool that allows users to post brief messages known as ‘‘tweets" consisting of up to 280 characters and multimedia content, including graphics, videos, and voice messages (Chawinga, 2017; Karami et al., 2020; Luo et al., 2019; Tang & Hew, 2017). Furthermore, Twitter allows users to communicate and interact with other users through features such as mentions, clicks to the like button, replies (retweet), and hashtags (Karami et al., 2020). The interaction, communication, collaboration, and sharing of information and content are the most valuable features of these tools (Burhanna et al., 2009; Hartshorne & Ajjan, 2009).

The research about the use of Twitter as a part of course instruction in higher education shows an emphasis on student-centered learning (Chawinga, 2017; Deaves et al., 2019; Hull & Dodd, 2017), supporting student active learning advocated by constructivism, social constructivism, and progressive education (Gao et al., 2012; Luo et al., 2019; Prestridge, 2014). The use of Twitter in the educational context also supports collaborative learning and peer instruction by helping learners to grasp ideas and add to their previous knowledge about a specified topic (Chawinga, 2017; Lokman et al., 2019; Ricoy & Feliz, 2016). This is directly connected to Vygotsky's social constructivist theory of learning, suggesting that internal development can only occur when the learner "is interacting with people in his environment and in cooperation with his peers" (p. 35). With the incorporation of Twitter for discussion, learning is interactive by promoting exchanges among students and between students and the teacher (Chawinga, 2017; Lokman et al., 2019; Ricoy & Feliz, 2016). Twitter can also be used to generate ideas and share resources with fellow researchers, leaders, and experts in a field of study, letting knowledge be seen as dynamic rather

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than being based on the fixed materials of a textbook (Gallardo-López & López-Noguero, 2020; Gleason & Manca, 2019; Loutou et al., 2018). Research has shown that Twitter can be used as an engagement tool in education since it has a high potential to increase learning motivation, understanding of a learning process, collaboration among learners (Gleason & Manca, 2019; Lokman et al., 2019; Malik et al., 2019), autonomous learning (Htay et al., 2020), and informal learning (Tess, 2013). Twitter allows users to communicate and interact with other users through features such as mentions, clicks to the like button, replies (retweet), and hashtags (Karami et al., 2020). Such accessibility exposes students to diverse perspectives on a topic; thus, promoting a critical and deeper reflection of the world. In this sense, students can reconstruct their views of the world and acquire meaningful learning when they are able to connect new concepts with prior learning experiences in communication with their peers, instructors, and a wider professional community.

The effective integration of Twitter as a learning tool fosters the active role of students by constructing their knowledge and understanding in collaboration with others. Using Twitter as a learning tool promotes scaffolding in a student's ZPD by creating opportunities to provide and receive constructive feedback in interaction with other learners (Hartshorne & Ajjan, 2009). Through the use of Twitter as an educational tool, students collaborate on problem-solving tasks and make significant connections between previous knowledge and new knowledge (Bada & Olusegun, 2015; Palincsar, 1998; Santoveña-Casal & Bernal-Bravo, 2019; Sarita, 2017). Overall, research indicates that using Twitter in the educational setting offers opportunities for students to acquire information, contribute to each other, engage in their respective communities of interest, participate their insights about specific topics, promote their learning capabilities, and enhance their motivation and engagement (Chawinga, 2017; Desselle, 2017; Gallardo-López & López-Noguero, 2020; Gleason & Manca, 2019; Lokman et al., 2019; Loutou et al., 2018; Malik et al., 2019; Ricoy & Feliz, 2016).

The literature suggests there are four Twitter features that can be used in higher education instruction to support student interaction and collaboration, namely the push strategy, back-channeling, polling, live-tweeting, and tweeting chats. The push strategy enables instructors to share significant course information, homework assignments, and class announcements to foster positive learning outcomes (Tang & Hew, 2017). Back-channel promotes engagement and community building by allowing students and instructors to tweet questions, running comments on the lecture, resources, and feedback through a given hashtag as an aggregator (Alim, 2017; Bista, 2015; Cronin, 2011, Deaves et al., 2019; Gallardo-López & López-Noguero, 2020; Kimmons & Veletsianos, 2016; Kunka, 2020; Li & Greenhow, 2015; Luo et al., 2019; ; Luo & Xie 2019; Ross et al., 2011). Twitter polls enable students to vote all at once when the instructor asks a question (Kunka, 2020), aiding reflection, self-assessment, and informal learning (Becker & Bishop, 2016; Strafford, 2016). Live-tweeting fosters students' engagement outside the classroom through the integration of real-world experience into the classroom (Kunka, 2020). Tweeting chats on different learning themes enhance the active participation of students as well as their critical

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thinking skills and collaboration (Abella-García et al., 2019; Deaves et al., 2019). Twitter, with its immediacy and ease of use, allows individuals to share their ideas without having to wait to be able to log in (Dunlap & Lowenthal, 2009).

3. Potential Benefits of Using Twitter as a Learning Tool from Vygotsky's Perspective

Twitter is an innovative instructional practice that promotes social learning and student competencies and fosters a motivating and dynamic classroom environment using a wide range of resources (Gallardo-López & López-Noguero, 2020; Wladimir et al., 2020). Twitter helps address the current need for promoting a highly connected, participatory, and creative learning environment (Selwyn, 2012; Ulbrich et al., 2012), shifting from a teacher-centered to a student-centered model of education (Prensky, 2001; Morrison, 2014; Zayed, 2019).

3.1 Impact on Academic Achievement

The literature showed improvement in higher education students' academic achievement and engagement through the use of Twitter as an educational tool. Research showed a significant correlation between students' use of Twitter and their course grades across different subject area (Ahmed, 2015; Amry, 2018; Diug et al., 2016; Junco et al., 2011; Katrimpouza et al., 2019; Lokman et al., 2019; Loutou et al., 2018). Some studies found that immediate instructor feedback via direct messages and instructor participation on Twitter were key factors for improving students' academic engagement and their grades (Ahmad, 2015; Diug et al., 2016; Junco et al., 2011, 2013; Katrimpouza et al., 2019; Loutou et al., 2018). Junco et al. (2011, 2013) found improved student engagement and grades when the use of Twitter was mandatory. However, these studies also suggest there was no difference in engagement and grades when the use of Twitter was non-mandatory.

The literature indicated that the use of Twitter as a learning tool increase students' participation, interaction, and collaboration with others as well as fostered an active role in their own learning (Amry, 2018; Katrimpouza et al., 2019; Loutou et al., 2018;). Loutou et al. (2018) suggested that students who participated in weekly activities on Twitter were more efficient in class compared to those who did not participate. Another important finding is that higher-performance students shared the most tweets, indicating higher-performance students are more open and positive toward the use of Twitter as an educational tool. These studies serve as a foundation for exploring the role of Twitter in supporting students' learning through collaboration, interaction, and active participation.

3.2 Student Reflection

Research shows that Twitter plays a role in promoting student reflection in higher education (Abella-García et al., 2019; Chawinga, 2017; Deaves et al., 2019; Ebner & Maurer, 2009; Luo et al., 2019; Prestridge, 2014; Wright, 2010). Students develop independent learning by actively reflecting on, sharing, and discussing content on

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Twitter (Chawinga, 2017). Chawinga suggested that Twitter was a catalyst for the learner-centered approach to teaching because students shared and discussed course materials, posted their course reflections, asked questions and clarification, and interacted amongst themselves and with their lecturer 24/7. Similarly, Abella-García et al.'s (2019) quantitative study indicated that Twitter enhances higher education students' critical thinking as the diversity of opinions on Twitter fosters deep thinking and a more critical spirit about the content. In their study, students were required to produce at least 100 tweets reflecting on educational content (e.g., information on educational technology, information about the assignments, etc.). Tweet chats on different themes of learning fostered the active participation of students and contributed to enhancing students' critical thinking skills, while fostering collaboration among them (Deaves et al., 2019).

Research shows that implementing Twitter in higher education engages students in writing and deep cognitive processes that foster learning (Ebner & Maurer, 2009; Wright, 2010). Wright (2010) investigated Twitter supports for students' self-reflective practices and found that students felt compelled to think more in-depth about the content and write more clearly and concisely. Furthermore, Ebner and Maurer (2009) identified that microblogging allows students to continuously be engaged in the task and thereby helped them generate a deeper level of reflection. Microblogging enables students to make more personal and critical statements by reflecting on content and immediately documenting their thoughts (Ebner & Maurer, 2009). Using Twitter as a reflective learning tool for discussion enables students to share personal reflections and review others' responses briefly, clearly, and concisely compared to the Blackboard discussion forum (Luo et al., 2019). Luo et al. (2019) found that the 140-character word limit on Twitter forced students to organize their thoughts meaningfully, reflect more deeply, and write more concisely about the tweet content. Additionally, Prestridge (2014) reported using Twitter for educational purposes improved undergraduate students' metacognitive skills through paraphrasing course content to share it on Twitter as they are consciously transforming information into actual knowledge. Prestridge found that students applied their knowledge by tweeting examples, pictures, links, and other visuals, showing students active learning.

3.3 Impact on Engagement

Students in higher education suffer from disengagement from their learning (Collaço, 2017; Halpin et al., 2021; Veletsianos & Navarrete, 2012). Collaço (2017) found that to raise higher education student engagement, instructors need to incorporate relevant and enjoyable activities that promote student-teacher interaction, student active role, and teamwork. Also, instructors need to create a safe learner-centered environment, set clear goals, establish high expectations, and provide timely feedback. Therefore, the use of Twitter in higher education instruction has the potential to increase students' engagement (Evans, 2014; Gleason & Manca, 2019; Halpin et al., 2020; Junco et al., 2011; Luo et al., 2019; Loutou et al., 2018).

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Luo et al.'s (2019) case study indicated that Twitter was successful in keeping learners engaged for a prolonged period of time compared to Blackboard. Students who used Twitter to participate in class discussion activities engaged in weekly tweeting more often compared to the students who used the Blackboard discussion forums. Twitter's easy-to-navigate interface, the use of hashtags, and the search functions enabled students to easily post, read and respond to other students' tweets. Twitter was effective in increasing learner-content and learner-learner interactivity. Similarly, Evans (2014) examined the role of Twitter in an undergraduate class and found that the increase in student engagement was connected to the number of students who used Twitter. The students' participation included sharing university-related activities, social events, and personal information (Evans, 2014). Amry's (2018) experimental study found that student participation was higher among students in the experimental group (combination of face-to-face and Twitter instruction) compared to control group (fully face-to-face instruction). Also, Junco et al. (2011) found that Twitter boosted engagement because students independently organized study groups and contributed ideas related to arranging extra-curricular activities. They suggested there was a positive correlation between student engagement and the mandatory use of Twitter. Therefore, Junco et al. (2011, 2013) recommended the mandatory use of Twitter to improve higher education students' engagement.

The use of Twitter shows promise, particularly for large lectures that present challenges for meaningful engagement (Halpin et al., 2020; Tiernan, 2014). Although limited empirical research exists on examining the effectiveness of the use of Twitter in large lectures, results suggest that it has a positive impact on student engagement (Elavsky et al., 2011; Gleason & Manca, 2019; Halpin et al., 2020; Junco et al., 2013; Junco et al., 2011; Tiernan, 2014). Elavsky et al. (2011) found that the use of Twitter in a large lecture setting positively influenced student engagement as it increased their participation and enthusiasm in relation to the course. Similarly, Halpin et al. found that the use of Twitter raised students' engagement with lecturers and with their peers. Gleason and Manca (2019) conducted a real-life case study using Twitter in a large classroom in higher education and found that the use of Twitter increased student participation and facilitated interaction with content experts. Ronto et al. (2021) found that Twitter's interactive approach promotes students' engagement and overall learning experience. Tiernan (2014) indicated that the Twitter platform offers engagement opportunities for timid students positively impacting engagement and discussion for the group as a whole. Kunka (2020) suggested that Twitter fosters student engagement in the higher education classroom, especially for timid students who do not often speak up in class. Twitter has the potential to actively engage students with contents, peers, instructors, and subject-matter experts by providing a space to share assignments and a communication channel. Bista (2015) reported that using Twitter as a new pedagogical tool allowed students to engage in academic activities, namely in receiving course information, sending questions to their instructors, and exchanging beneficial information with their classmates and instructor. Pérez-López et al.'s (2020) study indicated that creating the engagement

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process on the Twitter platform depended on active collaborative learning and enjoyment, and they mentioned that group activities were beneficial to foster student engagement in Twitter.

3.4 Sense of Community

Higher education students often feel isolated in online education (Badge et al., 2011; Carpenter & Krutka, 2014; Casey, 2013; Kunka, 2020; Veletsianos & Navarrete, 2012). Using Twitter can help students overcome feelings of isolation by creating a communication channel to share assignments and actively engage with others, with the course content, and with the professor both inside and outside the classroom (Anthony & Jewell, 2017; Domizi, 2013; Kunka, 2020; Loutou et al., 2018; Ross et al., 2015; Wright, 2010). Ross et al. (2015) identified a relationship between the efficiency of instructors' use of Twitter in the educational context and students' feeling sense of community.

Integrating Twitter helps create a learning community positively impacting students' belonging and connectedness (Friess & Lam, 2018; Rohr & Costello, 2015; Wright, 2010). Using Twitter fostered students a sense of community by overcoming shyness, feeling like part of a group, creating conversation, and finding answers to the course-related questions (Rohr & Costello, 2015). Research suggests that students realized the effectiveness of using Twitter as a social presence tool, which allowed them to feel linked to their classmates and the course content (Baisley-Nodine et al., 2018; Dhir et al., 2013; Dunlap & Lowenthal, 2009; Gleason & Greenhow, 2017; Gleason & Manca, 2019; Rohr & Costello, 2015). Social presence is defined as learners' ability to "bring themselves" to the learning environment (Dhir et al., 2013; Gleason & Greenhow, 2017; Gleason & Manca, 2019). Dunlap and Lowenthal (2009) found that the use of Twitter allowed for social interactions to occur more naturally and immediately and with a persistent presence. Baisley-Nodine et al.'s (2018) results showed a significant positive relationship between tweeting and social presence, suggesting that Twitter is a useful educational tool to promote social presence. Gleason and Manca (2019) found that the use of Twitter fostered students' social presence by providing opportunities to share humorous pictures, interact with peers and content experts, and connect different course activities (e.g., lecture, in-class activities, lab activities). Twitter helps students experience a sense of community that promotes daily communication and deep reflection on their practice (Wright, 2010). Domizi (2013) identified that the use of Twitter made students feel more connected to each other and the sense of community enabled them to feel more comfortable engaging in conversations, sharing resources, and reporting their own classroom experiences.

Research confirmed that Twitter has the potential to build a sense of academic community by increasing opportunities for learner-learner interaction (Clarke & Nelson, 2012; Lomicka & Lord, 2012). Lomicka and Lord (2012) showed that Twitter

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enhanced the sense of classroom community among students more quickly than traditional classroom approaches, as the learning community initially developed in the classroom is extended to the Twitter platform. Becker and Bishop (2016) mentioned that Twitter extended the students' network and interactions to interact with peers, instructors, and organizations. Anthony and Jewell (2017) indicated that using Twitter helped students create deeper social relations with peers beyond the classroom and with field professionals, which reflected the ability of Twitter to help students build social capital. Thus, the building of social networks can promote a sense of belonging and support retention (Anthony & Jewell, 2017). Abdelmalak (2015) illustrated that using Twitter in learning promoted an academic community for higher education students by enabling them to share thoughts and receive feedback from their classmates and other universities students. In addition, connecting with users who have similar interests beyond the classroom helped students build and extend their academic network. Students' interactions on Twitter enabled them to develop friendships and create opportunities for emotional support among students, which can lead to a stronger feeling of belonging to the academic community (Junco et al., 2011). However, Alqahtani (2016) found that using Twitter as an emotional support tool and for building new friendships was not necessary for Saudi students. Alqahtani (2016) explained the Saudi students just used Twitter to communicate with peers and expand their knowledge.

Many studies suggested that the use of Twitter as a learning tool promotes students' interactions with their instructors and academic experts (Dunlap & Lowenthal, 2009; Junco et al., 2011). Malki (2015) indicated that over 90% of faculty and students used Twitter for academic communications. Faculty used it for course reminders and announcements about the course's academic obligations while students engaged in after-class discussions with peers and instructors (Malki, 2015). Dunlap and Lowenthal (2009) mentioned that Twitter expanded the students' community to involve academic faculty and professional experts in their field, which gave students vast opportunities to ask questions and get answers and enhanced students' understanding. These academic interactions on Twitter can enable students to create continuing relationships among students and between students and their instructors, which allow both to benefit from each other and share valuable information and advice (Dunlap & Lowenthal, 2009). Buck (2017) highlighted that communication with instructors and academic experts supports students' professional academic identity and helps them participate in conferences and connect with academic faculty and/or students who have similar interests and/or researchers in the same field through online conversations. Therefore, higher education students learn how to communicate with instructors on Twitter using professional language (Chawinga, 2017).

Conclusion

Twitter has gained popularity among higher education instructors and students in recent decades due to its potential as an educational tool. Twitter's potentials as a learning tool in higher education contribute to four main areas: Impact on academic

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achievement; student reflection; impact on engagement; and sense of community.

Integrating Twitter into academic settings in a formal manner will give rise to a fundamental change in teaching approaches and learning types. As shown in the literature review, there are no authoritative instructions that define the best practices for using Twitter as a learning tool in the higher education classroom (Kunka, 2020). The most common ways of using Twitter as a learning tool in the educational context are limited to communication (e.g. sharing information about course-related materials and interacting with peers, instructors, or people from outside the class), collaboration (e.g. helping peer students by sharing information), class organization (e.g. sending reminders related to the course announcements, assignments, and exams), and assessment (e.g. conducting in-class formative assessment or after-class assessment) (Tang & Hew, 2017). Thus, based on the results obtained in this study, suggestions were developed to help instructors achieve the integration of using Twitter as a learning tool better. Instructors should clearly define the goals of using the Twitter platform in their course. They should ensure that students have internet access and the availability of devices. They should provide training sessions about how to use Twitter, the platform in the course, and give students a period to interact with the platform before class to ensure that students feel comfortable using the tool. They should encourage students who feel uncomfortable about sharing their tweets, to open an account and use a nickname. They should provide in-depth information on Twitter-related activities. They should make the use of Twitter activities a voluntary educational activity not mandatory, as well as give extra grades to interacted students, who participate with the course account on the Twitter platform, to give students a free space to positively participate and not put them under pressure, which they will benefit more than making the participated mandatory. They should be active on the Twitter platform by regularly monitoring their Twitter course accounts to provide academic and personal support for students. Also, they should encourage their students to participate and be involved in the Twitter platform and prepare their students by providing access to the broader learning communities and encouraging them to build relationships with experts in their educational field on the platform that will help them to know about the recent information in their field.

Among the main takeaways for educational practitioners, are the importance of considering students' prior Twitter experiences and providing extra resources for those without much experience in the platform, including ways to monitor their progress, along with the importance of integrating the use of Twitter in pedagogically sound manners, focusing on specific learning goals, and leading with clear rules and guidance, making expectations absolutely clear. Other important considerations are focusing on the creation of course designs that are useful for students, using strategies such as the separation of academic and personal accounts, as well as streamlined ways of accessing Twitter outlines and content in general that is posted on the platform.

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