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Utilisation of social media to support inquiry-based learning in science

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Abstract

The study conducted a systematic review to explore the types of social media platforms that could be used to support inquiry-based learning (IBL) in science. Data were accessed from Web of Science (WoS) and EBSCO databases. The search words used were 'inquiry', 'science' and 'social media'. From the search, eighty-six studies were identified. They were screened to fifteen using the inclusion and exclusion criteria according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines. Data from selected studies was extracted using a data extraction form. Findings revealed that SINQ application, Facebook, Twitter, Wikis, WhatsApp and Instagram could be used to support IBL. The study concluded that social media platforms are effective in supporting IBL since they motivate learners and encourage them to actively participate in their own learning and knowledge construction. They enable learners to collaborate and share ideas. The study further concluded that the use of social media could mitigate some of the challenges encountered in the implementation of IBL in schools. Challenges such as paucity of resources, lack of proper laboratories, and scarcity of time could be mitigated since social media taps into vast digital technologies that are available online. It was recommended that science teachers and learners should choose social media platforms that are available and appropriate for their contexts to support IBL in science.

Keywords: *social media, inquiry-based, learning, science*

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1. Introduction

Suarez et al. (2018) argue that in science education, there has been growing call for the adoption of inquiry-based learning (IBL) to facilitate positive learner attitudes toward science and a deeper understanding of scientific concepts. IBL is an instructional practice where learners are at the centre and take ownership of their own learning by posing questions, investigating and answering questions. It has been widely advocated for by major international bodies in many countries, because it raises levels of learners' scientific knowledge and understanding. It also helps learners to develop skills and attitudes needed for life in the 21st century (Caswell & LaBrie, 2017; Harlen, 2021). Savery (2015) argues that in IBL learners begin with a question followed by investigating the solutions, reflecting and communicating findings, and creating new knowledge based on the collected evidence. Learners propose and test hypotheses by carrying out experiments or observing phenomena. The Natural Science (NS) curriculum aims to enable learners to complete investigations, analyse problems and use practical processes and skills in evaluating solutions. This encourages learners to ask questions that could lead to further research and investigation (Department of Basic Education 2012).

According to Williams et al. (2016), and Smith et al. (2020), technology is a tool that can be used to support the implementation of IBL. Friesen and Scott (2013) note that the rise of technology and digital networks provides learners with new possibilities for gathering information and accessing experts, beyond the confines of the school. Technological advancements allow learners to work collaboratively with their peers to create knowledge and exchange ideas. Harlen (2021) views the use of technology in science education as equipping teachers and learners with digital and scientific literacy. There are numerous ways in which digital technologies can support learning in science. Evidence provided by the internet from different sources enables learners to make and test predictions and expand their understanding of the phenomena (Harlen, 2021). The internet provides learners with opportunities to connect with others and exchange ideas and experiences. Learners can use their digital devices to share their ideas with others, for instance through making animations, models, PowerPoint presentations or drawings on screen (Tamim et al., 2011). Most learners are already active in social media platforms such as WhatsApp (Ngakane & Madlela, 2022). Such platforms can be used by learners to share information and ideas.

This study focused on how social media could be used to support IBL in science. Hamdan (2022) and Ralph and Ralph (2013) describe social media as a group of internet-based

interactive platforms that allow individuals to communicate within virtual communities aided by platforms like Facebook, Twitter and Wikis (Ralph & Ralph, 2013), in which Facebook and Messenger are used by many learners daily (O'Brien, 2011). Ngakane and Madlela (2022) note that most learners have smart phones that can install WhatsApp software, and are already using WhatsApp as a means of communication on a daily basis. E-tools have also changed learners' perceptions towards natural sciences and have boosted their interest for science domains such as Biology, Chemistry, Physics and Mathematics (Smith et al., 2020). Other systematic review studies conducted on IBL did not focus on social media could support IBL. For instance, Chowdhury (2016) focused on IBL as an instructional strategy to increase student achievement in Mathematics and Science while Akuma and Gaigher (2021) describe contextual teaching challenges associated with inquiry-based practical work in Natural Sciences education. On the other hand, Khalaf and Mohammed Zin (2018) focus on traditional IBL pedagogy, while Wilson (2020) focuses on the effects of IBL on student achievement in the science classroom. Hence, this study identified social media platforms and discussed how they could be used to support IBL in science.

2. Conceptualisation and Literature Review

2.1. Inquiry-based learning

The term inquiry in education refers to seeking explanations or information by posing questions. IBL therefore, is a process where learners formulate questions, investigate phenomena, and then build new understandings, meanings and knowledge (Harlem, 2013; Soles, 2021), which is rooted in Vygotsky's constructivism. Minner et al. (2010) describe IBL as a learner-centred approach that emphasises high-order thinking skills and strengthening of the link between teaching and research. It views communication skills, problem-solving skills and critical thinking as more important than simply knowing subject content. Korkman and Metin (2021) say that IBL is one of the main methods in science education whose aim is to enable learners to solve problems that they encounter through conducting research. Learners pose a question, plan an investigation, conduct an investigation, analyse and interpret data, and communicate results. Learners can also examine books and other information sources to find out what is already known.

Pedaste et al. (2015) identify 5 distinct phases of inquiry. These are orientation, conceptualisation, investigation, conclusion and discussion as demonstrated in table 1.

Table 1

Phases and sub-phases of IBL framework

General phases	Definition	Sub-phases	Definition
Orientation	The process of stimulating curiosity about a topic and addressing a learning challenge through a problem statement		
Conceptualisation	The process of stating theory-based questions and/or hypotheses.	Questioning	The process of generating research questions based on the stated problem.
		Hypothesis Generation	The process of generating hypotheses regarding the stated problem.
Investigation	The process of planning exploration or experimentation, collecting and analysing data based on the experimental design or exploration.	Exploration	The process of systematic and planned data generation on the basis of a research question.
		Experimentation	The process of designing and conducting an experiment in order to test a hypothesis.
		Data Interpretation	The process of making meaning out of collected data and synthesising new knowledge.
Conclusion	The process of drawing conclusions from the data. Comparing inferences made based on data with hypotheses or research questions.		
Discussion	The process of presenting findings of particular phases or the whole inquiry cycle by communicating with others or engaging in reflective activities.	Communication	The process of presenting outcomes of an inquiry to others (peers, teachers) and collecting feedback from them.
		Reflection	The process of describing, critiquing, evaluating and discussing the whole inquiry cycle or a specific phase.

***Source*:** Pedaste et al. (2015)

According to Shamsudin et al. (2013) and Olympiou (2011), some of the inquiry-based teaching methods are experiment, simulations, demonstrations, project work and field study. Experiments afford learners opportunities to manipulate objects, test hypothesis, and work together to solve a problem or prove something of interest (Shamsudin et al., 2013). They enable learners to relate scientific concepts better. Shamsudin et al. (2013) assert that

simulations consist of role play and games. Demonstrations provide a concrete, visual way to help explain the topic. Through demonstration, classroom interaction is enhanced as learners become actively involved and motivated to ask questions about science content. Demonstrations teach learners to respect diversity and work collaboratively (Shamsudin et al., 2013). On the other hand, project work focuses on work given to learners by the teacher to carry out in groups. It helps learners to understand science concepts, and enhances their academic performance and development of science knowledge (Shamsudin et al., 2013). Another IBL method is field study which is conducted in a natural setting than in laboratories, classrooms, or other structured environments. During field trips learners and teachers find activities enjoyable and more real and challenging than inside the classroom. Learning activities and environment promote discovery, open discussions, and freedom to choose how to find and record information deemed most beneficial (Shamsudin et al., 2013).

2.2. Benefits of Inquiry-based Learning

According to Hermann and Miranda (2010), inquiry enables learners to develop explanations from evidence and connect explanations to existing knowledge to construct new knowledge. In the study of Minner et al. (2010), there was a positive impact in the student learning outcome when IBL methods that promote learner involvement are used instead of traditional learning methods that relegate learners to the role of passive listeners. Arauz (2013) argues that IBL methods in science education enable learners to write reports about their findings and discuss them with their peers. This assists them to develop written and oral skills in a meaningful way.

IBL increases information retention by learners (Zalloum, 2018); they can recall the activities that they practice with their peers. When learners are engaged with the learning material, they connect their prior experiences with the learning activities and develop their cognitive and meta-cognitive abilities that remain throughout everyday experiences. They also construct their knowledge through searching, synthesis, analysis and reorganising information that they get (Zalloum, 2018). When learners are given the opportunity to work on a problem, they gain new knowledge and deepen their current understanding (Sockalingam et al., 2011). As they explore and investigate, they take initiative and responsibility for their learning. Similarly, Hwang and Chang (2011) argue that when learners learn through discovery and investigation in authentic settings, they improve their critical thinking skills. Hence, learners

who are instructed and exposed to IBL improve their critical-thinking skills and achievement more than learners who are instructed through traditional learning strategies (Duran & Dokme, 2016). Ultimately, IBL motivates learners and increases their level of engagement in class (Johnson & Cuevas, 2016; Ramnarain & Hlatswayo, 2018).

2.3. Challenges of Inquiry-based Learning

The implementation of IBL in class often encounters some challenges. For example, open-ended learning environments are challenging for teachers who do not have training and exposure to IBL (Inoue & Buczynski, 2010). Similarly, Ramnarain and Hlatswayo (2018) note that implementation of IBL is constrained by time, as teachers use allocated time to try and complete the curriculum. On the other hand, Ncala (2016) pointed out overcrowding in science classrooms in townships public schools as an inhibiting factor to the implementation of IBL while Gutierez (2015) highlights the challenges of using inquiry-based teaching methods as lack of support, lack of training and non-availability of inquiry-based materials as well as time consuming nature of inquiry-based teaching. Therefore, teachers need to be motivated if inquiry-based methods are to be successfully applied (Adiguna & Sutapa, 2019).

3. Research Method

The study conducted a systematic literature review to collect data from previously conducted studies on the use of social media platforms to support IBL. Relevant studies were identified from Web of Science (WoS) and EBSCO data bases using ‘inquiry’, ‘science’ and ‘social media’ as search key words. The guidelines of the PRISMA 2020 statement, an updated guideline for reporting systematic reviews, were followed. In addition, the study used the evidence-based paradigm (Kitchenham et al., 2016), including the three main activities namely development of search strategy, selection of relevant studies, and extraction, analysis and synthesis of data from included studies.

Data was searched from WoS and EBSCO databases. According to Li et al. (2018), Clarivate Analytics’s Web of Science is the world’s leading scientific citation search and analytical information platform. WoS is an increasingly significant scientific instrument across countries and knowledge domains, being used by global scientists in different ways to answer

scientific questions. A volume of studies was screened using an inclusion and exclusion criteria highlighted in table 2.

Table 2

Study inclusion criteria

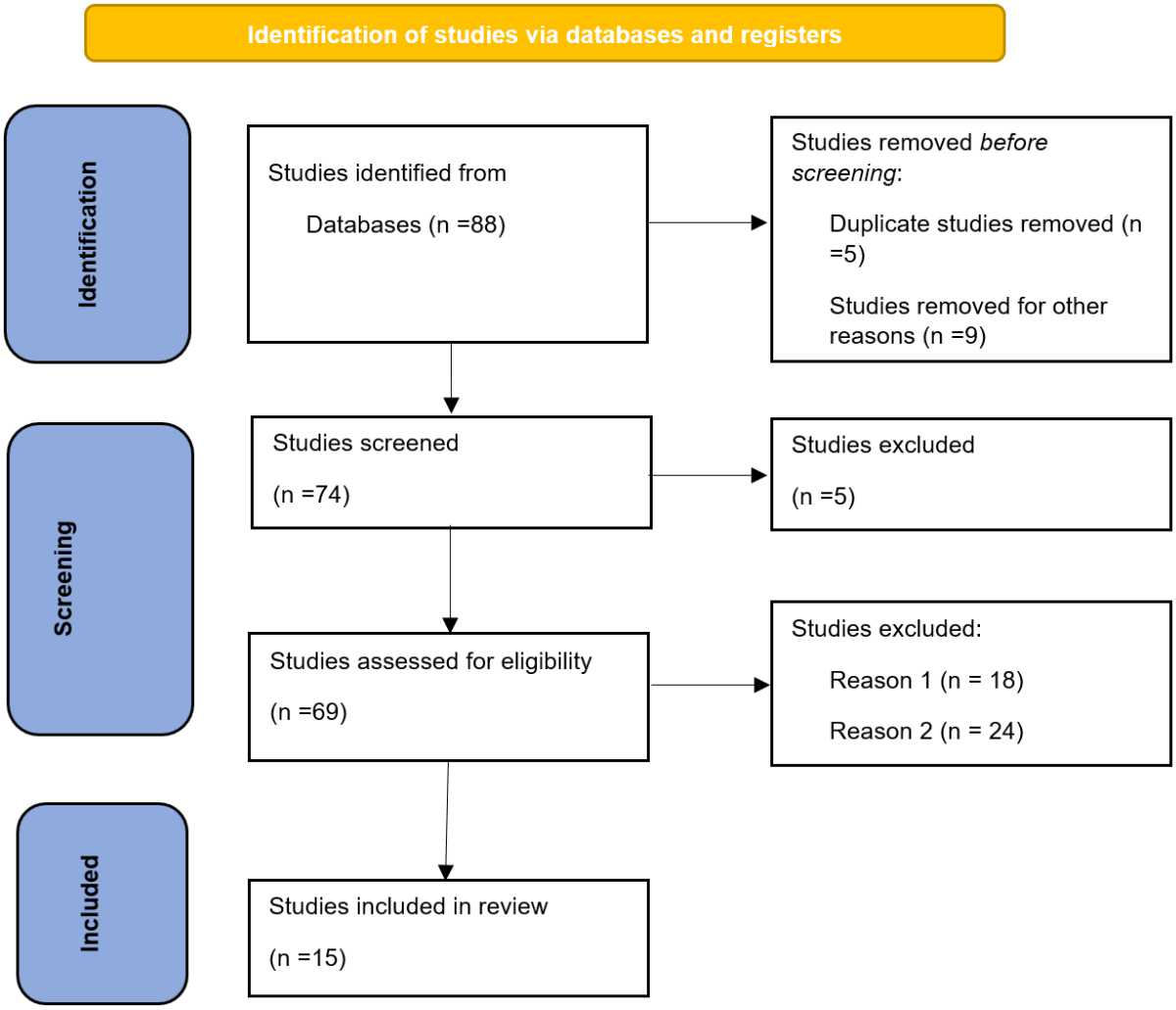
Number	Criteria	Description
1	Topic & purpose	The study's topic and purpose should directly relate to the use of social media in IBL
2	Period	The study should be published from 2010 to 2022.
3	Research Base	The study should be based on peer reviewed empirical evidence or systematic review.
4	Transparency	The study's research methodology must be well explained.
5	Validity/Reliability & trustworthiness	The study should ensure validity, and reliability and trustworthiness.

Studies that aligned with the criteria in table 2 were included for review. Figure 1 shows the PRISMA flow diagram highlighting the total number of studies identified from databases, and the number of studies that were eliminated, as well as the number of studies that were included for review.

As highlighted in figure 1, eighty-eight studies were identified from WoS and EBSCO data bases. Before the screening process, five duplicate studies were removed. Nine studies were also removed, because they focused on the use of social media platforms for corporate marketing and political education. Seventy-four studies entered the screening process. Five studies that were published before 2010 were excluded. After the screening process sixty-nine studies remained and were assessed for eligibility. Eighteen studies that focused on the use of technology in general in IBL were excluded. Twenty-four studies were excluded, because they focused on the use of social media as a communication tool between teachers, learners and school administration as opposed to its use in instructional delivery. Twelve studies that focused on the use of social media to support inquiry in the medicine field were also excluded. After assessment for eligibility, fifteen studies remained and were included for review.

Figure 1

PRISMA Flow Diagram



Source: Adapted PRISMA Flow Diagram, 2020 updated guidelines for reporting systematic reviews

Table 3 shows the details of studies that were included for review.

Table 3

Included studies

Author(s)	Research purpose	Research approach

Gubbels, Yip, Kim, & Ahn (2013)	To describe SINQ, a prototype mobile social media application that utilises social participation to guide learners through scientific inquiry process.	Qualitative approach
Lau, Lui, & Chu (2017)	To explore the use of wikis in a science inquiry-based project.	Mixed method approach
Ahn, Gubbels, Yip, Bonsignore, & Clegg (2013)	To establish the use of social media and learning analytics to understand how children engage in scientific inquiry.	Exploratory study
Ali, Sukri, Tahir& Said (2017)	Developing critical reflection skill among learners through collaborative inquiry using social media.	Qualitative approach
Lai, Yang, & Chu (2021)	Effective use of social media as a technical tool in formal learning.	Mixed method approach
Purnama (2018)	Incorporating Memes and Instagram to Enhance Student's Participation.	Mixed method approach
Alabdulkareem (2015)	Exploring the use and the impacts of social media on teaching and learning science in Saudi	Quantitative study
Abdillah, Handayani, Rosalyn, & Mukti (2021)	Collaborating digital social media for teaching science and Arabic during COVID-19 pandemic.	Quantitative approach
Alhumaid (2020)	To verify the usefulness of digital media and social networks in education	Quantitative approach
Devi, Gouthami, & Lakshmi (2019)	To establish the role of social media in teaching–learning process.	Systematic review
Jankauskaite (2015)	To analyse how to use social media in order to improve teaching and learning experience.	Systematic review
Hamdan (2022)	Investigating the role of social media in improving teaching.	Quantitative research
Van Den Beemt, Thurlings, & Willems (2020)	Towards an understanding of social media use in the classroom	Systematic review
Barhoumi (2015)	To find effectiveness of WhatsApp mobile learning activities guided by activity theory on students' knowledge management	Experimental research design
Mabaso (2021)	To explore the ways in which educators and students utilise WhatsApp for teaching and learning.	Qualitative approach.

4. Results

Table 4 shows types of social media platforms that were used in analysed studies.

Table 4

Data extraction form

Author(s)	Social media platform used in each study					
	Facebook	**Twitter**	**Wikis**	**WhatsApp**	**Instagram**	**SINQ Application**
Gubbels, Yip, Kim, & Ahn (2013)	**X**					**X**
Lau, Lui, & Chu (2017)			**X**			
Ahn, Gubbels, Yip, Bonsignore, & Clegg (2013)						**X**
Ali, Sukri, Tahir& Said (2017)	**X**					
Lai, Yang, & Chu (2021)	**X**		**X**	**X**		
Purnama (2018)					**X**	
Alabdulkareem (2015)	**X**	**X**		**X**	**X**	
Abdillah, Handayani, Rosalyn, & Mukti (2021)	**X**			**X**		
Alhumaid (2020)	**X**	**X**		**X**	**X**	
Devi, Gouthami, & Lakshmi (2019)	**X**	**X**			**X**	
Jankauskaite (2015)		**X**				
Hamdan (2022)	**X**	**X**		**X**	**X**	
Van Den Beemt, Thurlings, & Willems (2020)	**X**	**X**				
Barhoumi (2015)				**X**		
Mabaso (2021)				**X**		

Table 5 shows the types of social media platforms that are used to support IBL and the number of reviewed studies that focused on them.

Table 5

Types of social media

Type of social media	Number of studies that focused on the stated type
Facebook	9
Twitter	6
Wikis	2
WhatsApp	7
Instagram	5
SINQ Application	2

Data in table 5 show that Facebook, WhatsApp, Twitter and Instagram are the most used social media platforms in IBL. SINQ and Wikis are the least used.

Use of social media to support IBL phases. Data analysis shows that social media can be used in all phases of IBL that include orientation, conceptualisation, investigation, conclusion and discussion. The analysis focused on how each type of social media can be used at different phases of IBL.

SINQ Application. Ahn et al. (2012) developed SINQ as a mobile social media application to be used by learners to develop and share questions, hypotheses, and investigation ideas. In SINQ, learners can contribute smaller pieces of the inquiry process and attach them to others for example, hypotheses, questions and project ideas. The system aggregates these contributions into coherent science projects that learners can pursue on their own or with their peers (Gubbels et al., 2013). SINQ was designed to be specifically mobile to encourage learners to use it in their natural inquiry as it occurs in everyday life (Gubbels et al., 2013).

Gubbels et al. (2013) and Ahn et al. (2012) assert that SINQ fosters social, collaborative science inquiry in different ways, enabling learners to capture photos of their interest, develop a hypothesis and ask questions based on what is recorded, and post the response to their networks. For example, if a learner comes across an observation where butter does not dissolve in water, the learner can use SINQ on his/her mobile device to take a picture of butter and post the question: Why is butter not dissolving in water? (Gubbels et al., 2013). SINQ allows learners to enter into the science inquiry process at any point through contributions of questions, hypotheses, or investigation ideas to match the fluid nature of scientific inquiry. Gubbels et al (2013) argue that SINQ system guides learners through the entire process

regardless of where they start, because inquiry is not a linear process. Learners can traverse inquiry process through diverse pathways that are supported by the SINQ application which promotes more collaboration in science learning. Since most learners are more inclined to social media, SINQ application in their mobile devices make it easy for them to embark on inquiry with the help of their teachers and peers without any constraints imposed by distance and time (Cahill et al., 2011; Clegg et al., 2012).

Facebook. Social media is one of the most successful means of promoting education (Abdillah et al., 2021; Alabdulkareem, 2015; Devi et al., 2019). Hence, teacher can create a group on Facebook and then invites learners to join (Kaya & Bicen, 2016) helping learners to actively discuss and exchange thoughts on topics related to the subject. Devi et al. (2019) reveal that Facebook facilitates learner active participation in class and also motivate learners to continue participating in given work and projects. According to Shamsudin et al. (2013), in IBL, learners should play an active role than a passive role played in traditional methods.

Facebook can be used to exchange information and share internet links related to the study. It can also be used by teachers and learners to upload videos, pictures and documents related to the educational topic. Such visuals motivate learners and stimulate their active participation (Devi et al., 2019). Levy Vygotsky's social constructivist theory supports learner interaction and active participation in class, which Kapur (2018) views as based on interaction, discussion and information sharing among learners. With the use of Facebook, it allows learners to engage, interact and share information during the learning of science. Padaste et al. (2015) suggest that during the first orientation phase of IBL, the teacher and learners can use Facebook to engage and stimulate curiosity about the topic or stated problem. They can also use Facebook at the second conceptualisation phase to generate theory-based questions and hypotheses based on the stated problem.

WhatsApp. WhatsApp facilitates communication between individuals and groups (Hamdan, 2022) and it is available to all individuals who can download the application on their mobile phones. WhatsApp allows exchange of messages and uploading of videos and pictures and sending them to individuals and groups. The study of Alabdulkareem (2015) revealed that 100% of teachers and almost 73% of learners in Saudi Arabia used WhatsApp as the main social media tool. In Mabaso's (2022) study, learners stated that WhatsApp was a cost effective

social media for them that could be used to enhance and facilitate collaborative learning. Similarly, Alhumaid (2020) cites Cetinkaya (2017) learners developed positive attitudes towards the use of WhatsApp. Therefore, Mabaso (2022) suggests that WhatsApp should be used in the education process as a supportive technology for learners.

Group work and collaborative inquiry could be facilitated through WhatsApp platform (Mabaso, 2022; Barhoumi, 2015). For example, if learners are given a group investigation they can coordinate and pursue it using WhatsApp networks and discussion platforms. The study of Chaka and Govender (2017) conducted in Nigeria showed that learners have positive attitudes towards using WhatsApp in education since it enables them to co-operate and work as a team. Students manage to have rich, and effective collaborative discussions when utilising WhatsApp on group chat (Rambe & Chipunza, 2013). This is congruent with Vygotsky's constructivist theory that encourages learners to work collaboratively and share information and jointly create new knowledge and solutions to problems (Akpan et al., 2020).

WhatsApp learning technologies can help learners to integrate text, videos, podcasts, images, messages and audio files in a blended mobile learning process (Mabaso, 2022). Simulated videos and images can be sent by the teacher to learners through WhatsApp platform to enable learners to use the sense of sight to understand certain scientific concepts. During field study, the teacher and learners can take real pictures and videos of animals, plants and insects that they had observed in different habitats. Taken pictures, videos and voice notes can be posted in the class WhatsApp groups followed by discussions and sharing of experiences and information gathered during the field study. This kind of learning promotes inclusivity in class as it accommodates learners' different learning styles. Some learners understand concepts better through reading text while some understand better through seeing visuals and listening to audio.

Twitter. Twitter offers a quick way to post class announcements, reminders and timely information about class field trips (Devi et al., 2019). It can allow learners and teachers to engage in discussions and debates about certain topics (Alhumaid, 2020), which can improve learner involvements and allow for the exchange of ideas and experiences. Alhumaid (2020) views Twitter as a tool that enables learners to continue learning virtually beyond school walls. Most studies that examined the effect of educational use of social media on motivation found

that social media, especially Facebook and Twitter increased learners' motivation and engagement (Van Den Beemt et al., 2020).

Wikis. Wikis can be used for sharing knowledge, teamwork and collaborative writing (Jankauskaite, 2015). Lau et al. (2016) found that the use of wikis for collaborative inquiry project-based learning can help primary school learners to construct science knowledge in an online environment and the learners' attitudes towards the wiki were found to be positive at the end of the seven-week study. In addition, learners actively engaged, and also developed Internet search skills, collaborative problem solving competencies, and critical inquiry abilities. Similar results were obtained by Schmid and Trevisan (2013) where learners were enthusiastic about the use of wikis and shared creative ideas through the platform. In fact, teachers appreciated that they could monitor learners' progress and give prompt feedback. Meanwhile, Woo et al. (2011) revealed that Wikis facilitated learner collaboration on creative problem solving and peer critiquing in a Chinese primary school. This enables learners to share ideas and jointly create new knowledge.

Instagram. According to Hamdan (2022), Instagram is one of the most popular social media that is available free of charge to all users. While Instagram increases learners' motivation and participation level in class activities (Purnama, 2018), it can be used for role play and explanation of concepts through photos and videos. It is an effective platform that encourages learners to interact with their peers in the group works related to videos they share about tasks led by the teacher (Mansor & Rahim, 2017). Similar to social constructivism, learners tend to understand concepts better when they interact and share ideas with their peers and teachers (Akpan et al., 2020).

5. Discussion

The study revealed that the most widely used social media platforms in IBL are WhatsApp, Facebook, Instagram and Twitter while Wikis and SINQ are the least used. This is congruent with Chaka and Govender (2017) where learners expressed positive attitudes towards using WhatsApp since it enabled them to work collaboratively as a team and Rambe and Chipunza (2013) where learners praised WhatsApp for promoting rich collaborative discussions and making group tasks easy and effective. In relation to these results, Ngakane

and Madlela (2022) advocate for policy review in education to accommodate the use of WhatsApp since most students are already using it.

Most reviewed studies did not address how social media could be used to support IBL in the science class. SINQ was the only application that Gubbels et al. (2013) explained that could be used by learner to share questions, hypotheses and investigative ideas in class. SINQ also allows learners to contribute smaller pieces of the inquiry process, and then the system aggregates the small contributions into coherent science projects that learners can pursue with peers or on their own. Similarly, studies focused on Facebook, WhatsApp, Twitter, Wikis and Instagram did not explain how these platforms could be used to support different phases of IBL in the science class. They only stated their importance and use as mediums of conveying learning material without necessarily stating how they could be used to deliver instruction at different phases of IBL. Notable results include that of Devi et al. (2019) that Facebook can be used to exchange information and to upload educational videos, documents and pictures, Mabaso (2022) that collaborative inquiry could be facilitated through WhatsApp platform without going further to elaborate how and Devi et al. (2019) that Twitter offers a quick way to post class announcements, reminders and timely information about field trips. However, the emphasis was more on the importance and conveying of information, and study material without necessarily going deeper into how each platform cold be used to deliver instruction in science.

The results indicate that social media platforms can be used to support IBL in science, which can be applied in the Pedaste et al. (2015) phases of IBL to motivate learners and enrich instructional delivery. While studies showed that the use of social media in science could improve learner involvement, teamwork and collaboration in class (Mabaso, 2022; Barhoumi, 2015), only few studies have been conducted on the use of social media to support IBL. Hence, further research is needed on the techniques of using social media to support different phases of IBL in science.

6. Conclusion

The study concluded that social media platforms like WhatsApp, Facebook and Instagram are suitable for supporting different phases of IBL in science. However, the choice of using social media by teachers and learners should be determined by availability and suitability in a given context. Social media use could mitigate some of the challenges

encountered in IBL such as lack of resources and time. Hence, this study recommends science teachers and learners to utilise social media platforms that are available and suitable for their contexts to support IBL in science. However, given the very limited results from the previous studies, this study recommends conduct of further studies on how social media platforms could be used to support different phases of IBL in science.

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