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SCIENCE TEACHERS' PERCEPTION OF THE USE OF SOCIAL MEDIA IN TEACHING AND LEARNING IN SENIOR SECONDARY SCHOOLS IN OSUN STATE, NIGERIA

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Abstract

This study investigates science teachers' perspectives on the incorporation of social media into teaching and learning practices in senior secondary schools in Osun State, Nigeria. Guided by Vygotsky's theory of social learning and the theory of Uses and Gratification, a descriptive survey methodology was employed. Data was collected through the "Science Teachers' Perception of the Use of Social Media for Teaching and Learning Questionnaire" (STPUSMTLQ) from 200 science teachers across 20 senior secondary schools selected from four Local Government Areas. The questionnaire exhibited strong reliability, with a coefficient of 0.78. Data analysis entailed descriptive statistics, including mean, standard deviation, frequency count, and percentages. Results revealed that most science teachers hold positive perceptions regarding the efficacy of social media in teaching and learning, with an average mean score of 2.51. Furthermore, many teachers acknowledged the beneficial impact of social media on their teaching experiences, averaging a mean score of 2.60. Various factors were identified as influencing the adoption of social media for teaching and learning, with an average mean score of 3.60. Among social media platforms, WhatsApp emerged as the most frequently utilised by science teachers, with a mean score of 2.64, followed by Facebook (mean = 2.45) and Twitter (mean = 2.32). Conversely, platforms such as LinkedIn and WeChat were rarely, if ever, utilised by teachers. In conclusion, the study underscores that most science teachers in secondary schools exhibit positive perceptions of social media's efficacy in teaching and learning, with WhatsApp and Facebook being the most frequently employed platforms. Consequently, recommendations include organizing seminars by the school management to sensitise both teachers and students on the effective integration of social media for educational purposes.

Introduction

The integration of social media platforms into educational settings has emerged as a transformative trend in recent years, offering new avenues for communication, collaboration, and knowledge sharing. As technology continues to reshape the landscape of teaching and learning, educators are increasingly exploring innovative ways to leverage digital tools to enhance the educational

experience. The advent of social media has transformed communication patterns, enabling instantaneous interaction and information sharing across diverse geographical locations (Shrestha, Zia & Shrestha, 2013; Asian, 2010). Additionally, the integration of technology in education has been a topic of interest for educators, policymakers, and researchers alike. With the rapid advancement of digital tools and platforms, social media has emerged as a promising avenue for enhancing teaching and learning in various educational settings. Social media refers to a range of online applications and tools that facilitate social interaction and communication among digital media users (Hansen et al., 2017). It has transformed traditional one-way communication into dynamic dialogues, enabling knowledge sharing and collaboration among users.

A shift in social norms, values, and cultural dynamics has accompanied the rise of social media. It has become a cornerstone of contemporary society, shaping social interactions, information consumption patterns, and personal branding (Al-sharqi & Hashim, 2017; Berezan, 2018; Stathopoulos, 2019). In education, social media has revolutionised how students engage, interact, and socialise during their academic journeys (Terzi et al., 2019). It has provided opportunities for student-centered learning, critical thinking, problem-solving, and authentic learning experiences (Duncan, 2013). Science teachers increasingly use social media to enhance teaching and learning, engage students, and promote scientific literacy. They leverage various platforms, such as YouTube, where they create channels to share video lessons, experiments, and demonstrations, making complex concepts more accessible (Hew, 2014). On Facebook Groups, they facilitate online communities for students to discuss course material, ask questions, and share resources, promoting peer-to-peer learning and collaboration (Greenhow & Robelia, 2009). Additionally, teachers use blogs to share their experiences, reflections, and resources with a wider audience, providing a platform for students to publish their scientific writing and projects (Watters, 2011). Furthermore, social media empowers teachers to share resources, collaborate with peers, and connect with students and parents (Rutherford, 2010). This engagement in digital media sharing and social networking not only offers educational advantages but also fosters personal interactions and communication. It allows users to establish their personal brands and access professional opportunities (Berezan, 2018).

Despite its potential, the use of social media in education is still a relatively new and understudied area, particularly in senior secondary schools. Senior secondary schools are a critical stage in students' educational journey, as they prepare for higher education and the workforce. Therefore,

it is essential to understand how science teachers in senior secondary schools perceive the use of social media in teaching and learning. Science teachers hold a pivotal position in molding students' learning journeys and achievements, with their perceptions significantly impacting the incorporation of social media into their instructional methods (Ertmer, 2005). Specifically, for science educators, social media stands as a potent instrument for advancing scientific literacy, nurturing critical thinking skills, and fostering active student involvement with intricate scientific ideas (Banchi & Bell, 2008). Studies have shown that science teachers who incorporate social media into their teaching practices can benefit from increased student motivation, improved communication, and enhanced collaboration (Withey, 2014). Furthermore, social media can provide science teachers with a platform to share their own experiences, insights, and expertise with a wider audience, potentially influencing public perceptions of science and promoting a greater understanding of scientific issues (Eisenhart & Edwards, 2016). Research has shown that teachers' perceptions of technology can influence their use of technology in the classroom (Inan & Lowther, 2010). Teachers who have positive perceptions of technology are more likely to use it in their teaching practices, while those who have negative perceptions are less likely to adopt it (Teo, 2009). Furthermore, teachers' perceptions of technology can also influence their students' attitudes towards technology (Li, 2010).

While some studies have explored the use of social media in education, few have focused specifically on science teachers' perceptions of social media in senior secondary schools. This study aims to address this gap by investigating science teachers' perceptions of the use of social media in teaching and learning in senior secondary schools. The study will explore the benefits and challenges of using social media in science education, as well as the factors that influence science teachers' adoption and integration of social media in their teaching practices. The findings of this study can inform the development of policies and practices that support the effective integration of social media in science education in senior secondary schools.

Research Purpose

This study aims to explore the perceptions of science teachers in senior secondary schools in Osun State, Nigeria, regarding the use of social media in teaching and learning practices. Specifically, it seeks to answer the following research questions:

Research Questions

1. What is the perception of science teachers on the use of social media in education?
2. Does the use of social media enhance the teaching experience of science teachers?
3. What is the frequency of use of social media by science teachers in secondary schools?
4. What Factors limit the use of social media by science teachers for teaching and learning?

Research Methods

This study employed a descriptive survey research design to investigate the perceptions of science teachers in government senior secondary schools in Osun Central Senatorial District, Osun State, Nigeria, regarding the use of social media for teaching and learning. The population of this study consisted of all science teachers in government senior secondary schools in Osun Central Senatorial District, Osun State. A sample of 200 experienced science teachers was selected from the population using a simple random sampling technique. The sampling procedure involved selecting four Local Government Areas (LGAs) from Osun Central Senatorial District, followed by the selection of 20 secondary schools from the four LGAs. Five schools were selected from each LGA, and 10 science teachers from each of the selected schools participated in the study. A well-constructed questionnaire, titled Science Teachers' Perception of The Use of social media for Teaching and Learning (STPUSMTLQ), was used to collect data from the respondents. The questionnaire consisted of two sections: Section A and Section B. Section A collected demographic data from the teachers, including their name, school, qualification, years of experience, gender, types of devices used, and subject of specialization. Section B contained items that assessed how teachers perceived the use of social media for teaching and learning. The items were rated on a 4-point Likert scale, with options ranging from Strongly Agree (SA) to Disagree (D). The reliability of the instrument was tested by administering it to 20 science secondary school teachers outside the sample area. The Cronbach's Alpha reliability coefficient was calculated to be 0.78, indicating a high level of internal consistency. The data collected from the respondents were analyzed qualitatively using descriptive statistical analysis. The analysis involved calculating the mean, standard deviation, frequency count, and percentage mean for each item on the questionnaire. The results were presented in tables and figures to facilitate easy interpretation.

Results

Research Questions

Research question 1: What is the perception of science teachers on the use of social media in education?

Table 1 shows the perception of science teachers on the use of social media in education

S/N	Items	SA	A	D	SD	Mean	STD
1	I feel that using social media would enable me to accomplish teaching and learning activities more quickly.	86 43.0%	100 50.0%	8 4.0%	6 3.0%	1.67	0.69
2	I do not find social media useful in my teaching	12 6.0%	18 9.0%	76 38.0%	94 47.0%	3.26	0.85
3	I perceived that using social media would enhance my effectiveness when performing my classroom tasks.	46 23.0%	124 62.0%	22 11.0%	8 4.0%	1.96	0.70
4	I do not feel that using social media can give me greater control over my work	16 8.0%	22 11.0%	104 52.0%	58 29.0%	3.02	0.85
5	I perceived that using social media to teach would create an interesting and active learning atmosphere.	58 29.0%	104 54.0%	24 12.0%	14 7.0%	1.97	0.83
6	I do not feel that using social media would enhance my effectiveness when performing my classroom tasks.	16 8.0%	14 7.0%	132 66.0%	38 19.0%	3.96	0.76
7	I do not feel comfortable using social media for teaching	12 6.0%	6 3.0%	80 40.0%	102 51.0%	3.36	0.80
8	I am not satisfied with the teacher-learner interaction when using social media for teaching and learning	18 9.0%	64 32.0%	58 29.0%	60 30.0%	2.80	0.97
9	I am aware that the use of social media in school makes teaching and learning effective.	86 43.0%	84 42.0%	18 9.0%	12 6.0%	1.78	0.84
10	I feel that using social media in teaching would make explanations easy.	94 47.0%	84 42.0%	12 6.0%	10 5.0%	1.69	0.79
11	I do not feel that using social media would enhance better interaction with my students	18 9.%	22 11.0%	100 50.0%	60 30.0%	3.01	0.87
12	I feel that it is very important for everyone to be proficient in the use of social media for teaching	68 34.0%	116 58.%	16 8.0%	- -	1.74	0.59

Average mean = 2.51

The detailed analysis of Table 1 revealed that the secondary school teachers agreed to the following statements: I feel that using social media would enable me to accomplish teaching and learning activities more quickly (Mean = 1.67), I perceived that using social media would enhance my effectiveness when performing my classroom tasks (Mean=1.96), I perceived that using social media to teach would create an interesting and active learning atmosphere (Mean=1.97), I am aware that the use of social media in school makes teaching and learning effective (Mean=1.78), I feel that using social media in teaching would make explanations easy (Mean=1.69). Therefore, science teachers in Osun State have positive perceived influence of social media on education with

the Average mean of 2.51, out of the maximum obtainable score of 4.00, which is higher the standard mean of 0.79. This implies that science teachers have a good perception toward the usage of social media in education. The indication of the result was that secondary school teachers particularly teachers in Osun State supported the use of social media as a tool for the teaching-learning process for a better education system.

Research question 2: Does the use of social media enhance the teaching experience of science teachers?

Table 2 shows how the use of social media enhances the teaching experience of science teachers

S/N	Items	SA	A	D	SD	Mean	STD
1	I do not enjoy using social media to teach my students	24 12.0%	18 9.0%	132 54.0%	50 25.0%	2.92	0.90
2	I do not feel that social media can promote an interactive and engaged teaching-learning process.	26 13.0%	22 11.0%	66 10.0%	20 10.0%	2.73	0.81
3	I feel that Social media makes me comfortable because I understand how to use it in teaching.	68 34.0%	104 52.0%	20 10.0%	8 4.0%	1.84	0.75
4	I need training on how to use social media in teaching	26 13.0%	48 24.0%	82 41.0%	44 22.0%	2.72	0.95
5	I do not find social media convenient to use for teaching my students	18 8.0%	20 10.0%	100 50.0%	64 32.0%	3.06	0.86
6	I do not feel that I can use social media for teaching effectively day by day	16 8.0%	20 10.0%	102 51.0%	62 31.0%	3.05	0.85
7	I would rather prefer to adopt the traditional mode of teaching, instead of using social media.	20 10.0%	26 13.0%	92 46.0%	62 31.0%	2.98	0.91
8	I would prefer to use social media in any of my classes.	58 29.0%	92 46.0%	34 17.0%	16 8.0%	2.04	0.88
9	I do not enjoy using social media to teach my students	16 8.0%	26 13.0%	92 46.0%	66 33.0%	3.04	0.88
10	I feel it would be easy to control the class through the use of social media	26 13.0%	92 46.0%	64 32.0%	18 9.0%	2.37	0.82
11	I need training on how to use social media in teaching	26 13.%	50 25.0%	80 40.0%	44 44.0%	2.71	0.95
12	I do not feel that it is very important as a teacher to be proficient in the use of social media for teaching	22 11.0%	40 20.%	90 45.0%	48 24.0%	2.82	0.92
13	I do not feel that the use of social media would help me to provide immediate feedback to my students.	22 11.0%	80 40.0%	84 42.0%	14 7.0%	2.45	0.78
14	I perceived that using social media would make me versatile in my profession	86 43.0%	86 43.0%	18 9.0%	10 5.0%	1.76	0.81

Average mean = 2.60

The detailed analysis of Table 2 revealed that the secondary school teachers agreed to the following statements: I perceived that using social media would make me versatile in my profession (Mean=1.76), I feel it would be easy to control the class through the use of social media (Mean=2.37), I would prefer to use social media in any of my classes (Mean=2.04), I feel that Social media makes me comfortable because I understand how to use it in teaching (Mean=1.84). therefore, Science teachers in Osun State have a positive perceived influence on how social media will enhance their teaching experience with an average mean of 2.60, out of the maximum obtainable score of 4.00, which has a higher standard mean of 0.95. This implies that science teachers have a good perception of how social media will enhance the teaching experience. The indication of the result was that secondary school teachers particularly teachers in Osun State supported the use of social media as a tool for the teaching-learning process for better education system.

Research question 3: What Factors limit the use of social media by science teachers for teaching and learning?

Table 3: shows the factors that limit the use of social media by science teachers for teaching and learning

S/N	Items	SA	A	D	SD	Mean	STD
1	There is no internet network in my area to connect with my students	32 34.0%	34 17.0%	110 55.0%	24 12.0%	2.63	0.89
2	Students develop a lazy attitude towards lessons if they use social media	28 14.0%	94 47.0%	64 32.0%	14 7.0%	2.32	0.80
3	I feel that Students are easily distracted while using social media for teaching and learning.	26 13.0%	92 12.0%	70 45.0%	12 6.0%	2.45	0.79
4	The use of social media for teaching and learning may encourage malpractice	34 17.0%	76 38.0%	70 35.0%	20 10.0%	2.38	0.88
5	Teachers have no devices to support social media learning.	26 13.0%	40 20.0%	116 58.0%	18 9.0%	2.63	0.82
6	The cost of the devices is too high and it is a problem affecting the use of social media in teaching and learning	38 19.0%	114 57.0%	30 15.0%	18 9.0%	2.14	0.82
7	The use of social media for teaching and learning causes unproductive behaviour.	14 7.0%	74 35.0%	72 36.0%	40 22.0%	2.73	0.88
8	I feel that the use of social media for teaching and learning can expose the students to inappropriate materials	18 9.0%	82 41.0%	80 40.0%	20 10.0%	2.51	0.79
9	I feel that there is difficulty in class control while using social media for teaching	26 13.0%	52 26.0%	106 53.0%	14 7.0%	2.54	0.80
10	I feel the student misuse the social media tools during instructional time	32 16.0%	124 62.0%	30 15.0%	14 7.0%	2.13	0.75
11	Using social media for teaching and learning bring about waste of time	22 11.0%	30 15.0%	104 52.0%	44 22.0%	2.85	0.88
12	I feel that the use of social media brings about unsolicited negative comments during the teaching-learning process	18 9.0%	28 14.%	136 68.0%	18 9.0%	2.77	0.73
Average mean = 3.60							

The detailed analysis in Table 3 revealed that secondary school teachers in Osun State have had so many factors that limit the usage of social media by science teachers for teaching and learning and its average mean of 3.60, out of the maximum obtainable score of 4.00, which has higher the standard mean of 0.89. This implies that science teachers have many factors limiting the use of social media for teaching and learning. The result indicated that secondary school teachers particularly teachers in Osun State have been influenced by factors that limit the usage of social media as a tool for the teaching-learning process for a better education system.

Research question 4: What is the frequency of use of social media by science teachers in secondary schools?

Table 4: Shows the frequency of use of social media by science teachers in secondary schools

S/N	Items	VO	O	R	N	Mean	STD
1	Whatsapp	114	86	-	-	2.64	0.89
		57.0%	43.0%	-	-		
2	Twitter	40	96	32	32	2.32	0.80
		20.0%	48.0%	16.0%	16.0%		
3	Facebook	102	66	30	2	2.45	0.79
		51.0%	33.0%	15.0%	1.0%		
4	Telegram	14	58	70	58	2.38	0.88
		7.0%	29.0%	35.0%	29.0%		
5	LinkedIn	26	16	76	82	2.14	0.82
		13.0%	8.0%	38.0%	41.0%		

Table 4 shows that WhatsApp is the highest among all other social media with (Mean=2.64), followed by Facebook which is one of the social media that is frequently used among science teachers (Mean=2.45), Twitter with (Mean=2.32). Other social media that are rarely used or not used by science teachers are Telegram (Mean=2.38) and LinkedIn (Mean=2.14). The highest standard mean is 0.89. This can be interpreted as a spread of this application among users in secondary schools in Osun state, and its ease of use in society, since it is a tool for communication and is available in e-stores for free download.

Discussion of Findings

Many science teachers have positive perceptions towards the use of social media in education. This is consistent with a study conducted at South East European University by Bexheti et al. (2016), which found that social media is already influencing how teachers discover, create, share, and learn knowledge through media opportunities and collaboration with each other. The study revealed that teachers view social media as a valuable tool for teaching and learning, with almost all teachers in the study being aware of major social media sites and over 75% having visited a social media site within the past month. Nearly 25% of teachers also posted content on social media. However, there is a significant variation in usage patterns across different social media platforms. Furthermore, the majority of teachers agreed that using social media would enable them to complete teaching and learning activities more efficiently, which aligns with the findings of Stathopoulou et al. (2019) that incorporating social media in education has a positive impact on

students' deep learning experience. Social media serves as a supportive tool for students during the learning process and is beneficial for educators as well.

The majority of science teachers hold a positive view towards using social media as a means of providing timely feedback to their students. This is consistent with the findings of Li (2017), who conducted a study on the use of social media for teaching English via Facebook in a polytechnic institution in China. The teacher in this study suggested that students create a company Facebook page for collaborative group work, which significantly improved student engagement in the project. This is in line with the findings of Tess (2013), who found that social media can promote a more interactive and engaging learning environment in science education. Similarly, Manca and Ranieri (2016) discovered that social media can facilitate collaborative learning and knowledge co-construction in science education. However, it is important to note that the effective use of social media in teaching requires careful planning and consideration of potential challenges, such as privacy concerns and digital distractions (Carpenter and Krutka, 2014).

Despite the potential benefits of social media in education, several factors limit its use by science teachers for teaching and learning. The research revealed that most science teachers in secondary schools in Osun state have experienced limitations in using social media, including the lack of internet connectivity in classrooms, which hinders students' ability to access online resources (mean = 2.63, below the average mean of 3.60). Additionally, students are easily distracted while using social media, which can negatively impact their learning experience. Furthermore, the use of social media for teaching and learning remains low due to various reasons. One major constraint is the high cost of devices, which makes it difficult for teachers and students to access social media platforms (Alabdulkareem, 2015). Moreover, social media requires adequate relevant resources to support learners' activities, which may not always be available (Jewitt et al., 2010). Learners may not have equal access to resources, and some may not have the necessary skills to interact with others through online discussions (Arkorful & Abaidoo, 2017). Another significant challenge is the difficulty in class control while using social media, which can lead to unsolicited negative comments during the teaching-learning process. Teachers must be comfortable with the use of online learning tools to effectively integrate social media into their teaching practices (Bora & Ahmed, 2013). Social pressure can also influence the adoption of social media in education (Bora & Ahmed, 2013). As Gefen and Straub (2010) noted, the inherent qualities of social media for

information exchange do not guarantee its adoption for every activity and by everyone, including in the learning process.

The frequency of social media use among science teachers in secondary schools, particularly in Osun state, reflects a notable reliance on WhatsApp as the primary platform, closely followed by Facebook (Fasae & Adegbilero-Iwari, 2016; Sim, Naidu & Apparasamy, 2014; Lie, 2013). This trend is consistent with previous studies that have shown Facebook to be a popular social media platform among teachers (Lie, 2013). Lie (2013) found that 31.6% of teachers spent 2-4 hours per day using social media, including Facebook, Twitter, Tumblr, and Edmodo. Similarly, Yeo (2014) found that both students and lecturers viewed Facebook as a valuable "social" platform, fostering relationships beyond the confines of the classroom through seamless connectivity and information exchange. This suggests that social media platforms like Facebook can play a significant role in promoting collaborative learning and building relationships between teachers and students. Moreover, Albalawi (2017) discovered that WhatsApp emerged as the dominant social media tool among mathematics teachers, used by a significant majority of participants. However, its integration into mathematics instruction was classified as "sometimes," indicating a potential underutilization of social media's pedagogical potential in certain domains (Albalawi, 2017). This highlights the need for teachers to explore innovative ways to integrate social media into their teaching practices, particularly in subjects like mathematics where visual and interactive learning can be beneficial. The reliance on WhatsApp and Facebook among science teachers in secondary schools in Osun state suggests that these platforms are seen as convenient and accessible tools for communication and collaboration. However, it is essential to recognize the potential limitations of social media in teaching and learning, and to explore ways to harness their pedagogical potential more effectively.

Conclusion

This study has highlighted the positive perception of science teachers towards the use of social media for teaching and learning. The frequent use of WhatsApp among science teachers in secondary schools in Osun state is noteworthy, but there is a need for teachers to explore other social networking sites to enhance their teaching practices. However, the study also identified several factors that limit the use of social media in teaching and learning in secondary schools in Nigeria. These limitations may negatively impact the attitudes of teachers towards the use of social

media for learning. Therefore, it is crucial to address these challenges to promote the integration of social media into teaching and learning in secondary schools. The use of social media in teaching and learning offers numerous advantages over traditional means. It provides opportunities for collaborative learning, seamless connectivity, and information exchange beyond the confines of the classroom. Therefore, the government should encourage the use of social media for teaching and learning in secondary schools and create an enabling environment for its effective integration into the curriculum.

This study underscores the importance of social media in enhancing teaching and learning in secondary schools. It is essential to address the challenges limiting its use and encourage the exploration of other social networking sites to maximize its pedagogical potential.

Recommendations

Based on the findings of this study, the following recommendations are suggested:

1. Teachers should embrace social media as a valuable tool for disseminating relevant information to their students. By doing so, teachers can create engaging, interactive, and collaborative learning environments that can enhance students' academic performance and prepare them for the digital age.
2. Teachers should guide students on the proper use of social media to prevent its negative use. By providing clear guidelines and expectations, teachers can help students develop healthy online habits and avoid potential risks associated with social media use.
3. Teachers should receive training on how to effectively use social media for teaching and learning. This training can help teachers develop the necessary skills and knowledge to leverage the benefits of social media and create engaging, interactive, and collaborative learning environments.
4. School management should organize seminars to sensitize both teachers and students on the effective use of social media. These seminars can provide an opportunity for teachers and students to learn about the benefits and risks associated with social media use and develop strategies to use it effectively in the classroom.
5. Stakeholders should formulate policies to strengthen and guide the use of social media in schools. These policies should address issues such as privacy, security, and responsible use of social media. By doing so, stakeholders can create a safe and supportive learning environment that promotes the positive use of social media in education.

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