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METHODS

Strategies for effective integration of management information system in secondary schools: teachers' perspective from Awka Education zone in Anambra State

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This study looked into effective integration of management information system (MIS) in secondary schools in Awka Education Zone in Anambra State. The study was guided by three research questions and two hypotheses tested at the 0.05 level of significance based on a descriptive survey research approach. The sampling technique adopted was purposive type in order to focus on a determined specialized number of respondents. The study's sample size was 130 secondary school teachers. A researcher-created questionnaire was used to gather the data. The tool was rigorously evaluated by two experts. When the instrument's internal consistency was examined using Cronbach's alpha, a reliability value of 0.88 was found. A *t*-test was used to assess the hypotheses after arithmetic mean and standard deviation scores were used to analyze the data. The findings demonstrated that the MIS assists the school in managing tests, enrolments, and fees by providing different people with password protection. The findings further revealed that MIS opportunities and needs should be identified and prioritized according to educational objectives rather than technical criteria. In addition, there is no significant difference in the male and female teachers' knowledge about MIS in secondary schools. The implications of the study were drawn and recommendations proffered.

Keywords: strategies management information system (MIS), secondary schools, teachers

Introduction

The of management information system (MIS) in secondary schools has significantly altered the duties and working methods of instructors. MIS aids teachers in the planning of their instruction, provision of feedback, access to institutions, and efficient utilization of information and communication technology (ICT) software and hardware for the teaching-learning process (1). In terms of strategy, MIS in secondary schools assists the teacher in establishing the goals of the institution, formulating long-term plans, allocating resources, forming future educational philosophies, assessing the effectiveness of teachers, and gauging the success of the institution. In this approach, teacher-led educational leadership can be initiated and utilized through school administration information systems.

According to Kristiawan and Muhaimin (2), the many responsibilities of the school administration have undoubtedly made secondary education in Nigeria more challenging over time, especially in the contemporary ICT era. This task can only be completed effectively through an administrative procedure that makes use of MIS in areas like organized data processing, information storage, and retrieval. An MIS is intended to help instructors carry out their duties through an efficient and well-organized method of information gathering, processing, storing, and retrieval (3). It involves using contemporary tools and automated processes to input, process, store, and retrieve organizational data for efficient administration.

Schools use MIS to assist a variety of administrative tasks such resource and personnel allocation, assessment records, reporting, attendance monitoring, and student personnel administration (4). All of the recreational activities and services that schools offer to students to support them in achieving their academic objectives are included in student organizational leadership. It includes all of the tasks and offerings made to students in order to help them reach their academic goals. To manage student personnel, MIS is utilized for a number of functions, including handling applications, monitoring students' attendance to school, calculating students' grades, and communicating with students and parents via the web and e-mail. Ampofo (5) said something along these lines, saying that information about other students, such as their enrollment status, private information, parents, address, phone number, and e-mail, may be maintained and updated online. When assigned homework assignments to complete at home, students download study materials and resources from the internet in order to have access to a range of perspectives and knowledge on the subject.

According to Chidinmachinenye and Anachuna (6), the MIS can also be used to track students who have fallen behind on their payments, allocate and manage hostel space, and manage infrastructure and fees. The MIS is also used to store and update students' electronic personal information, such as address, phone number, and e-mail information for parents, as well as data from continuous assessments. The MIS allows for the easy payment of school fees, online tracking by the administration, and the prevention of financial fraud and payment defaults, which encourages accountability and efficient financial management in the school. In addition, it stores information about the current state of the school and offers data on the school environment from outside sources. These factors led to the development of MISs from straightforward data processing systems. It was a step toward assisting teachers in making decisions by summarizing facts. Teachers can view information from MISs in the form of predefined reports. It coordinates the resources required to transform data (inputs) into the necessary information (outputs), therefore achieving an organization's goals (7). It is focused on past deeds, results, and outcomes. The management uses a planned system of employee practices, designed machinery (often computers), and the appropriate information to enable improved planning, control, and decision-making.

As we can see, information systems have altered the responsibilities and working practices of educators. In addition, the usage and analysis of information in schools will not only help teachers understand what has to be done to improve student performances but also guarantee the effectiveness of implementing these changes. Teachers will begin to understand innovation initiatives on this issue when they use data. As a result, it can be said that school teachers will be able to identify what is necessary through the use of information systems, such as access to information, interpretation of data, and use of data in decision-making, system evaluation, and development of an efficient use of the system (8). According to research carried out in several countries, MISs can boost the effectiveness of instructional processes in secondary schools (1, 9). At all levels, the school system is seeing an increase in demand for educational services. To communicate knowledge on teaching and learning both within the school's boundaries and to the wider public, secondary school instructors must today deal with enormous volumes of data that they must swiftly analyze. This is a result of the massive growth in the student population, the variety of curricula, and the intricacy of the secondary school system. Efficient MISs in secondary schools in the Awka Education Zone of Anambra State are still mostly unknown. To close the gaps that exist, the present research aims about:

1. Teachers' knowledge about MIS in secondary schools.
2. Challenges of integrating MIS in secondary schools.
3. Strategies for effective integration of MIS in secondary schools.

Research hypotheses

H_{o1} There is no significant difference in the male and female teachers' knowledge about MIS in secondary schools.

H_{o2} Male and female teachers do not differ significantly in their strategies for effective integration of MIS in secondary schools.

Methods

This study used a descriptive research approach and the survey technique. Respondents were given a self-developed cross-sectional survey questionnaire with 4 groups and 30 items. The questionnaire was made specifically to address the objectives of the study on methods for an efficient MIS in secondary schools in the Awka Education Zone in Anambra State.

The questionnaire was based on a 4-point Likert scale, with score ranging from 4 = strongly agree, 3 = agree, 2 = disagree, and 1 = strongly disagree. Secondary schools in Awka Education Zone in Anambra State were used for the study. The subjects responded to the statements given and chose their answers based on their perceptions. The survey was distributed electronically to the respondents using Google Form, which is a cost-effective method that can reach many respondents who are in different areas. The various sections of the questionnaire included (Cluster 1) personal details, (Cluster 2) the teachers' knowledge about MIS in secondary schools, (Cluster 3) the challenges

encountered in integrating MIS in secondary schools, and (Cluster 4) strategies for effective integration of MIS in secondary schools.

The Cronbach's coefficient alpha (α) was used in this study to gauge the instrument's internal reliability. This technique, often referred to as test index score, is used to determine the relationship between the results of each test item and the test's overall score. Items with high test index correlation scores have high reliability, whereas those with low test index correlation scores have low reliability and will be removed from the exam. This instrument's Cronbach's alpha value is 0.89, which is good. The instrument's alpha value demonstrates its dependability.

The researcher's data analysis process culminated using 130 questionnaires. Statistical Packages for the Social Sciences (SPSS) version 22 was used to retrieve the information collected from the participants from the Google Form and conduct the analysis. To determine the frequency and proportion of the entire population, the researcher employed descriptive analysis. In addition, it is used to calculate the percentage, mean, and standard deviation. The research hypotheses were also examined using inferential statistics (*t*-test). To decide whether to accept or reject the null hypothesis, the computed *t*-value is compared to the critical value. If the total computed *t*-value is more than the critical *t*-value, the null hypothesis is rejected; however, if the absolute calculated *t*-value is less than the critical *t*-value, the null hypothesis should be accepted.

Results

The researcher presents and discusses the study's findings in this part.

Research question 1: What are the teachers' knowledge about MIS in secondary schools?

Table 1 displays the MIS expertise of secondary school teachers. The findings show that MISs, which grant different people with password protection, facilitate the administration of tests, enrollment, and fee administration (male = 3.23, female = 1.69). Meanwhile, MIS provides parental access to the progress of their students studying in that school (male = 2.28, female = 2.7). The whole items 2, 5, 7, 8, and 10 having a mean score of 2.88, 3.23, 2.7, 2.7, and 3.05 and corresponding standard deviation of 0.93, 0.99, 0.94, 0.85, and 1.05 were accepted by male teachers. While items 1, 3, 4, 6, and 9 with a mean score below 2.50 and corresponding standard deviation of 1.02, 1.04, 1.16, 1.17, 1.02, 1.00, and 1.00 were rejected by male teachers. Similarly, items 3, 6, 9, and 10 having a mean score of 2.74, 2.82, 3.49, and 2.56 and corresponding standard deviation of 1.26, 1.02, 0.85, and 0.93 were accepted by female teachers. While items 1, 2, 4, 5, 7, and 8 having a mean score below 2.50 and corresponding standard deviation of 1.13, 1.13, 1.20, 1.12, 0.94, and 0.85 were rejected by female teachers.

Research questions 2: What are the challenges encountered in integrating MIS in secondary schools?

TABLE 1 | Mean and standard deviation on the teacher's knowledge about management information system (MIS) in secondary schools.

S/N	Items	Male			Female		
		$\bar{x}$	SD	Dec	$\bar{x}$	SD	Dec
1.	All of the school records that are routinely gathered and stored are created and secured by MIS.	1.95	1.02	R	1.74	1.13	R
2.	In MIS, data are gathered and stored in a manner that makes it simple to search for and access it using just few phrases, even years later.	2.88	0.93	A	1.94	1.13	R
3.	From the gathered data, MIS provides reports that the stakeholders may examine and use to make data-driven choices.	1.6	1.04	R	2.74	1.26	A
4.	MIS uses artificial intelligence to learn from data, which helps to enhance how the program runs and performs.	2	1.16	R	1.78	1.20	R
5.	MIS assists the school in managing tests, enrollment, and fees by providing different people with restricted access.	3.23	0.99	A	1.69	1.12	R
6.	Through roles-based access restrictions for students, professors, and administrators, MIS aids in academic administration.	1.8	1.17	R	2.82	1.02	A
7.	MIS enables teachers to grade pupils remotely, which makes it simple for institutions to print out the results.	1.9	1.02	R	2.7	0.94	A
8.	MIS provides parental access to the progress of their students studying in that school.	2.28	1.00	R	2.7	0.85	A
9.	MIS gives student safety information and assists schools in managing attendance of students online utilizing a biometric method.	1.53	1.00	R	3.49	0.85	A
10.	MIS makes it possible to run lessons, post notes, retrieve exams, and provide crucial notifications.	3.05	1.05	A	2.56	0.93	A
	Overall mean	**2.22**	**1.04**		**2.42**	**1.04**	

Dec, decision, $\bar{x}$, mean, Std.D, standard deviation, R, rejected, A, accepted.

Table 2 shows that the overall reporting mean indicated a modest level. For epileptic power supply challenges (M = 2.86, SD = 0.69), 15% of respondents strongly agree, 58% agree, 25% disagree, and 2% strongly disagree. For the lack of learning equipment tools and resource in new pedagogical approaches (M = 3.58, SD = 0.63), 64% of respondents strongly agree, 32% agree, 3% disagree, and 2% strongly disagree. For the lack of software is the major factor that made difficulties in the use of MIS (M = 3.06, SD = 0.92), 35% of respondents strongly agree, 48% agree, 7% disagree, and 11% strongly disagree. For the statement Administrators lacked understanding of how to effectively use the data generated from MIS" (M = 2.74, SD = 0.76), 18% of respondents strongly agree, 40% agree, 41% disagree, and 2% strongly disagree. For the statement "Teachers lack of knowledge in integrating MIS into pedagogical practice" (M = 2.75, SD = 0.95), 27% of respondents strongly agree, 31% agree, 33% disagree, and 9% strongly disagree. Finally, one of the problems that prevents teachers from using MIS is lack of confidence (M = 2.53, SD = 0.77), with 8% of respondents strongly agree, 47% agree, 36% disagree, and 9% strongly disagree. The mean level of statements was between 2.53 and 3.58. And the overall mean constraints is M = 2.86, SD = 0.961, which is at a moderate level. The whole items 11, 12, 13, 14, 15, 16, 17, 18, 19, and 20 having a mean score above 2.50 and corresponding standard deviation of 0.69, 1.41, 0.83, 0.77, 0.95, 1.34, 0.76, 0.92, 1.31, and 0.63 were accepted.

Research questions 3: What are the strategies for effective integration of MIS in secondary schools?

Table 3 shows the strategies for effective integration of MIS in secondary schools as perceived by teachers. It reveals that MIS opportunities and needs should be identified and prioritized according to educational objectives rather than technical criteria with mean scores of (male = 3.65, female = 2). Meanwhile, school management should merge curriculum resources from/to website with MIS learning platforms for students to use (male = 3.38, female = 2.83). Also, the functionality of MIS applications and the range of data must be defined with respect to the integrity of the process which is to be supported (male = 3.2, female = 2.42). The whole items 22, 23, 26, 27, 29, and 30 having a mean score above 2.50 and corresponding standard deviation of 0.88, 0.88, 1.20, 1.34, 0.97, and 0.86 were accepted by male teachers. While items 21, 24, 25, and 28 having a mean score below 2.50 and corresponding standard deviation of 1.18, 1.16, 0.64, and 1.30 were rejected by male teachers. Similarly, items 11, 12, 13, 14, 16, 17, 18, 19, and 20 having a mean score above 2.50 and corresponding standard deviation of 0.98, 0.71, 0.78, 1.03, 1.00, 1.22, 0.78, and 0.69 were all accepted by female teachers. While items 14 and 15 having a mean score of 2.42 and 2.42 corresponding to standard deviation of 0.75 and 1.19 were rejected by female teachers.

Hypothesis 1: There is no significant difference in the male and female teachers' knowledge about MIS in secondary schools.

From the independent *t*-test means in Table 4, the results show that the perceived male teachers' knowledge about MIS in secondary schools (M = 2.22, SD = 1.04) is lower

TABLE 2 | Mean and standard deviation on the challenges encountered in integrating management information system (MIS) in secondary schools.

S/N	Items	SA	A	D	SD	$\bar{x}$	Std.D	Dec
11.	Epileptic power supply	20 (15%)	75 (58%)	32 (25%)	3 (2%)	2.86	0.69	A
12.	Unstable and unreliable internet services	71 (55%)	8 (6%)	3 (2%)	48 (37%)	2.78	1.41	A
13.	Teachers have skills in using MIS, but they still make less use of the technology because they did not have enough time.	32 (25%)	41 (32%)	55 (42%)	2 (2%)	2.79	0.83	A
14.	One of the problems that prevent teachers from using MIS is lack of confidence.	10 (8%)	61 (47%)	47 (36%)	12 (9%)	2.53	0.77	A
15.	Teachers lack of knowledge in integrating MIS into pedagogical practice.	35 (27%)	40 (31%)	43 (33%)	12 (9%)	2.75	0.95	A
16.	Pressure to prepare students for exam and tests inhibits MIS integration	61 (47%)	11 (8%)	16 (12%)	42 (32%)	2.70	1.34	A
17.	Administrators lacked understanding of how to effectively use the data generated from MIS.	23 (18%)	52 (40%)	53 (41%)	2 (2%)	2.74	0.76	A
18.	Lack of software is the major factor that made difficulties in the use of MIS.	45 (35%)	62 (48%)	9 (7%)	14 (11%)	3.06	0.92	A
19.	Most of the teachers lack the skill and expertise to use the MIS because they did not get enough training opportunities.	66 (51%)	12 (9%)	16 (12%)	36 (28%)	2.83	1.31	A
20.	Lack of learning equipment tools and resource in new pedagogical approaches.	83 (64%)	41 (32%)	4 (3%)	2 (2%)	3.58	0.63	A
	Overall mean					**2.86**	**0.961**	

Dec, decision, $\bar{x}$, mean, Std.D, standard deviation, R, rejected, A, accepted.

TABLE 3 | Mean and standard deviation on the strategies for effective integration of management information system (MIS) in secondary schools.

S/N	Items	Male			Female		
		$\bar{x}$	SD	Dec	$\bar{x}$	SD	Dec
21.	Improving educational practices and communication to ensure resource-based competencies are understood and used across the school.	2.48	1.18	R	3.00	0.98	A
22.	MIS opportunities and needs should be identified and prioritized according to educational objectives rather than technical criteria.	3.65	0.88	A	2.91	0.71	A
23.	Top school management should develop commitment to a strategic vision for MISs.	3.33	0.88	A	2.92	0.78	A
24.	Competency for the use of MISs should be ensured among teachers, students, and parents in other not to waste the investments.	2.5	1.16	R	2.42	0.75	R
25.	The functionality of MIS applications and the range of data must be defined with respect to the integrity of the process which is to be supported.	3.2	0.64	R	2.42	1.19	R
26.	MIS rules and procedures for data access, retrieval, and processing should be clarified and disclosed to allow collaboration.	2.83	1.20	A	2.58	1.03	A
27.	MIS should be configured to provide access to data or applications whenever a user needs via connections based on modern communication technologies	2.95	1.34	A	2.54	1.00	A
28.	MIS should retain the expected level of functionality, efficiency, and effectiveness in a changing environment.	2.45	1.30	R	2.76	1.22	A
29.	School management should create and maintain blogs or web sites to address frequently asked questions about MIS integration	3.25	0.97	A	2.53	0.78	A
30.	School management should merge curriculum resources from/to website with MIS learning platforms for students to use	3.38	0.86	A	2.83	0.69	A
	Overall mean	**3.00**	**1.04**		**2.69**	**0.91**	

Dec, decision, $\bar{x}$, mean, Std.D, standard deviation, R, rejected, A, accepted.

than the perceived female teachers' knowledge about MIS in secondary schools (M = 2.42, SD = 1.04). The calculated *t*-value of 1.012, which is not significant at 0.05 level and also lower than the critical *t*-value of 1.976, indicates that there is no significant difference in the male and female teachers' knowledge about MIS in secondary schools.

Hypothesis 2: Male and female teachers do not differ significantly in their strategies for effective integration of MIS in secondary schools.

From the independent *t*-test means in **Table 5**, the results show that the strategies adopted by male teachers for effective integration of MIS in secondary schools (M = 3.002, SD = 1.041) are higher than the strategies adopted by female teachers for effective integration of MIS in secondary schools (M = 2.691, SD = 0.913). The calculated *t*-value of 1.631, which is not significant at 0.05 level and also lower than the critical *t*-value of 1.976, indicates that male and female teachers do not differ significantly in their strategies for effective integration of MIS in secondary schools.

Discussion

In research question 1, it was determined if secondary school teachers were knowledgeable about MIS. The results show that MIS assists the school in managing tests, enrollment, and fees by providing different people with restricted access. Okeke and Ikediugwu (9) reported that MIS is undoubtedly a veritable tool for the effectiveness of secondary school administration and hence its proper management is a panacea for the success of institutions. MIS can assist schools in accelerating their development. This is because, in order to advance the secondary school and enhance students' intellectual development, the school system needs an effective MIS, according to Yusuf et al. (8). The teachers are aware that MIS makes it possible to run courses, post notes, download evaluations, and provide crucial updates. A similar finding by Kasimiri et al. (10) indicated that effective management of information in secondary schools aids the school administrators in resolving administrative challenges emanated from paucity of accurate, dependable, and timely information for decision-making. Information gathering technique could be utilized to improve administrative decisions in the school system in areas like planning lecture and examination timetables electronically to avoid clashes, providing the needed information related to students, staff, and the school activities, managing resources, recruitment and promotion of staff, appointment of school principals and other school officers in taking decisions on students' enrolments, offices, and staff quarters allocations, among others (11).

Research question 2 dealt with the challenges encountered in integrating MIS in secondary schools. Based on the result, the lack of learning equipment tools and resource in new pedagogical approaches is a major challenge encountered

TABLE 4 | *t*-test group statistics on difference in the male and female teachers' knowledge about management information system (MIS) in secondary schools.

Gender	*n*	$\bar{x}$	SD	*t*-cal	*t*-crit	df	sig.
Male	40	2.22	1.04				
				1.012	1.976	128	0.05
Female	90	2.42	1.04				

TABLE 5 | *t*-test group statistics on difference in strategies for effective integration of management information system (MIS) in secondary schools.

Group	*n*	$\bar{x}$	SD	*t*-cal	*t*-crit	df	sig.
Male	40	3.002	1.041				
				1.631	1.976	128	0.05
Female	90	2.691	0.913				

in integrating MIS in secondary schools. This finding is related to the report by Zheng and Albert (12) who observed that inadequate technology infrastructure, resource materials, and other basic tools for effective teaching makes learning difficult. Jones (13) posits that individual teachers who possessed less than upper secondary education are considerably less likely to use computers for a range of reasons. MIS is the central focus for educational policies and the needs for its integration into educational curriculum cannot be undermined. However, students, teachers, and administrators in Nigerian secondary schools are yet to be adequately exposed to the realities of numerous challenges of the 21st century that are technologically driven in outlook (7). Another challenge that confronts the use of MIS in school is hinged on inadequate accessibility of facilities. Studies indicate that majority of schools are having inadequate ICT facilities, which hampered teachers' use of the technology. For instance, teachers who are competent and desirous of using computers in school may not be able to use it if there is no computer and internet facilities provided for them (14).

Research question 3 studies the strategies for effective integration of MIS in secondary schools. The findings indicate that MIS opportunities and needs should be identified and prioritized according to educational objectives rather than technical criteria. This is in line with Ampofo (5), who noted that the success of the management information collection technique depends to a large extent on the availability of accurate, relevant, and timely information for decision-making. Based on the analysis made, it was discovered that MIS should be configured to provide access to data or applications whenever a user needs via connections based on modern communication technologies. According to Evgenievna (15), new ICT applications in secondary school administration call for increased information processing capacity due to the difficulty of the tasks that the schools must do. Secondary school officials must incorporate new educational MIS in order to make informed decisions, and essential stakeholders in secondary education should regularly attend symposia, conventions, and training on the subject (16).

Conclusion

This study focused on strategies for effective integration of MIS in secondary schools from Awka Education Zone in Anambra State, Nigeria. It is clear that MIS aids the school in managing tests, enrollments, and fees by providing different people with limited access. It is believed that there is a lack of learning equipment tools and resources in new pedagogical approaches. From the outcome of analysis of the data presented in this study, the researcher has revealed that MIS opportunities and needs should be identified and prioritized according to educational objectives rather than technical criteria.

It is clear that MISs coordinate, organize, and conduct work procedures to ensure the smooth operation of the educational system. The results of this study will educate teachers and students on how to handle information systems effectively in secondary schools. This study's findings will give administrators and educators the knowledge they need for well-informed management, policy making, and assessment. The outcome of the study will, therefore, help schools conduct exams, enrolments, and fees management.

Recommendations

The study makes the following recommendations.

1. The information collection personnel should use the identified information collection techniques in providing the relevant data for decision activities in the secondary schools.
2. Concerted efforts should be made by the government and stakeholders in secondary education toward genuine integration of ICT policies in the school system.
3. There is need for attitudinal change by secondary school teachers and administration on adequate effective utilization of ICT facilities.
4. State government should ensure that the level of MIS in all public secondary schools is high with adequate funds.
5. The information analysis personnel should use the data processing and analysis methods identified to process the captured data and transform them into information. This information should be used for administrative decision-making in the secondary schools.

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