Impact of Information Seeking Strategies and Utilization of Mathematics Teachers' on the performance of SSS 2 Students in Lagos State, Nigeria: Implication to Pedagogical Practices

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Abstract

This study focuses on correlates of mathematics teachers' information seeking behaviour and information utilization on students' performance in senior secondary school mathematics in Lagos State. The subjects for the study were 100 (one hundred) mathematics teachers and 400 (four hundred) senior secondary school students from all education districts in Lagos State. The instrument used to gather data was Teachers' information seeking behaviour and utilization.

Two research hypotheses were raised. The independent variables were teachers and students characteristics, students performance in mathematics was dependent variable and information seeking behaviour and information utilization were the moderator variables. The study examines teachers information seeking behaviour and information utilization as predictors to students performance in mathematics. Students ability scores in first term and information utilization was predicted to be the determinant of students achievement in mathematics whereby students' abilities scores in 2nd and 3rd terms had significant effect with mathematics teachers information utilization df $= F_{(3.115 \ \& \ 4.953)}$: P<0.01

Teachers' information seeking behaviour was also correlated with students' ability scores in 1st, 2nd and 3rd. the result showed that teachers information seeking behaviour and information utilization had significant effect on students' performance in mathematics at $F_{1.035 = 29.729}$; P<0.01 and the regression analysis also indicated that teachers characteristics are determinants of students performance.The results obtained from the study, showed that:

There is a significant relationship in teachers information seeking behaviour and information utilization on students performance in mathematics.

Teachers' characteristics had a great measure on students' performance in mathematics, based on the findings, the causes of poor performance in mathematics were identified

and recommendations were made and how to improve teaching and learning mathematics were also made.

Keywords

Information seeking, Performance, Information need, Curriculum.

Introduction

The classroom situation is the avenue that helps pupils to grow in school environment by facilitating their development. Though a lot of problems hindered pupils' development in the classroom situation, some of these problems as identified by Adewale (2004) include, methods of imparting knowledge to learners, inadequate instructional materials, poor attitudes to information seeking behaviour etc. These problems have been blamed in part on the method of information seeking behaviour and utilization, on the method of imparting knowledge to learners, on school effectiveness and products of schooling (Olatoye, 2005).Information seeking behavior is a broad term encompassing the ways individuals articulate their information needs, seek, evaluate, select and use information. Wilson (2006), noted that information- seeking behavior results as recognition of some need, perceived by the user, the need to seek information by an individual is going to be fuelled by the person's desire; to achieve a particular goal. In the course of information seeking, the individual may interact with people, manual information systems, or with computer-oriented information systems (Zawawi and Majid, 2001).

In studying information seeking behavior, the discovery of people, strategies, expectations, attitudes, and anxieties promotes relationships as people live and work with other information users (Foster, 2005). Information-seeking behavior involves personal reasons for seeking information, the kinds of information which are being sought, and the ways and sources in which needed information is being sought. In order to understand the information seeking behavior of individuals and organizations, barriers that prevent individuals from seeking and getting information have to be accorded great importance (Zawaw and Majid, 2001). Thus information seeking is a natural and necessary mechanism of human existence which services as a major tool in the implementation of curriculum.

Bronstein (2007) believes that curriculum and instruction are related. However, he went further to say that, they are two separate entities. To him curriculum is a plan for further action. According to Johnson (2004), curriculum consists of a series of intended learning outcomes which should guide instruction. Curriculum is different from instruction in that it prescribes or anticipates the results of instruction. Johnson was not able to include activities, materials and methods which take place during curriculum implementation. Foster (2005) feels that curriculum is the whole of the educative process, that is, total environment in which education takes place. Thus a good curriculum should have the following characteristics:

- Define objectives that grew-out of the values held by a society.

- Learning experiences that are expressed or implied objectives.

- Periodic evaluation of the curriculum in terms of the objectives, the learning experience, and constant methods in the light of new experiences.

According to Johnson (2004), curriculum should be continuous, dynamic and also reflect values of its immediate environment. In trying to associate curriculum with activities conducted by the School, Savior and Wiberty and Jones (1989) said that, it is the total effort of the school to bring about the desired outcomes in school and out of school situation. It was later put in another form by saying, it is a time taken to achieve broad educational goals and related specific objectives of an identifiable population served by a single school centre (Wilson 2006). This definition includes all efforts of the school in providing experiences. Although it is associated with the school effort, experiences could be obtained from within and outside the school.

Olatoye (2005) is of the view that curriculum should be all embracing. He agrees that experiences are planned, and can be obtained from the school, home, community or any other suitable place. He therefore, defines curriculum as, all the experiences that learners have in a programme of education whose purpose is to achieve broad goals and related specific objectives; specific objective is planned in terms of a frame work of theory and research or past and present professional practice. (Using adequate instructional materials, seeking adequate information to support delivery system to the learners).

Information Seeking Strategies

Information seeking is undertaken to identify a message that satisfies a perceived need (Wiberty and Jones 1989), This activity may be actively or passively done when taking steps to satisfy a felt need (Bronstein 2007). On the other hand, Wilson (2006) noted that research-on information seeking has looked at how individuals go about finding the materials that they need in order to satisfy information needs. It was therefore noted on this basis that a number of models had been developed in this respect like Ellis 1993 model, Eisenberg and berkowitz's 1992 model, and Kuhlthau's 1992 model, these models have been applied in a number of Instances to follow up the patterns used in seeking information or to explain how information, could be sought systematically.

Information-seeking behavior refers to the way People search for and utilize information (Zawawi and Majid, 2001). Most times teachers information seeking behaviour involves active or purposeful information seeking as a result of the need to write lesson note for class discussions, seminars, workshops or conferences. Foster (2005) noted that teachers find information seeking and information utilization as problems because they do not learn the basic information skills .They end up using trial and error methods of research that limits their capabilities to satisfy their needs. Wilson's model notes that in the process of seeking - information, problems are encountered. After interacting with the information sources (like in a library), what a user actually needs may not tally with what is practically available, due to constraints either within the stock or due to the users own inability. Olatoye (2002) noted that mathematicians encounter barriers like library anxiety. Users' perceptions of the library and its programs also act as an intervening variable to information utilization in the library.

Finding ways of intercepting the barriers in information seeking is one of the solutions to improve the mathematics teachers' information seeking behaviour. Bearing in mind that contact with students in information institutions, is either through reference interviews or bibliographic instruction sessions. Wiberty and Jones (1989) acknowledged that modes of informing are specific to each person's concern, and the topics they want to be informed about. Both noted that libraries in the past sought to accommodate this need by promoting current awareness services (CAS) and selective dissemination of information (SDI), either through print or electronic means. These are user outreach avenues that can still be optimally utilized in addition to customizing access points in accordance with user interests using Internet. Foster (2005) in analyzing and comparing the bibliographic instruction research processes taught to students and the approaches that students used in seeking information noted that students should not be left to flounder on their own. Library skills should be put in context of the research process.

Callison (1997) recommends increased efforts to expand instruction beyond the one-time lesson in introducing students to the library. Lau (2001) observed that, although librarians had assumed the role of information educators, their work tended to occur in isolation. Teamwork was needed to make library instruction part of the learning process. The publicity services provided in an information institution play a big role in influencing how its resources are utilized and how the users seek for information.

Information Need

The fields of information and communication sciences both contribute to the understanding of the ways in which users seek and use information, information science brings an understanding of individuals, including their cultural context, which is complementary to communications; conversely. communications bring a theoretical background that strengthens the approaches used in Information Science (Bronstein, 2007). Information needs has been understood by information science as evolving from vague awareness of something missing and culminates in locating information that contributes to understanding and meaning .

Johnson (1996) stated that information needs are of various types. Apart from expressed need or articulated needs, there are unexpressed needs which the client is aware of but does not like to express. In order to meet the information needs of individuals, adequate knowledge about information seeking behavior and information use is crucial. This knowledge may also lead to the discovery of novel information behavior and user profiles that can be used to enhance existing information models or even develop new ones. In order for them to be effective information providers, librarians and other information professionals require a fuller understanding of the information seeking behavior needs and uses of individuals (/http://informationR.net/ir/11-4/paper260.html/).

The need to become informed and knowledgeable individuals leads to the process of identifying information needs. This process does not work without finding out how individual articulate, seek, evaluate, select and finally use the required information, commonly referred to as information-seeking behavior (Zawawi and Majid 2001).The understanding of information needs and information-seeking behavior of various professional groups is essential as it helps in the planning, implementation and operation of information systems and services in a particular

work setting. This is because the working environment and type of task performed by individuals shape their information needs and the Ways they acquire, select and use this information.

Information Need and Seeking Behavior of Mathematics Professional

Several studies have shown a relationship between the task and complexity of information needs, (Devadason and Lingham, 1997). Adequate knowledge of mathematical information need is vital for libraries to effectively support their research activities. A library is considered as the nucleus for any research activity and an essential ingredient for a viable research system, providing an account of previous intellectual endeavors, which serves as the foundation for new concepts and ideas. The knowledge about the type of materials preferred by scientists is an important factor in determining and satisfying their information needs (Mujid, Anwar and Eisenschitz, 1999). Studies on information needs and seeking behavior of scientists can be traced back to the late 1940s (Renekar, 1993). Since then, a lot of studies have been conducted on different aspects of information needs and information seeking behavior of mathematician. Many studies have revealed that factors such as cost, past success, accuracy, reliability, comprehensiveness, usefulness, response time, accessibility, technical quality, and format control to the selection and use of different information sources by scientists (Shanmugah, 1999; and Yang, 1998).

Mathematics is part of human life for many thousands of years - the need for Mathematicians' information is probably as old as human existence. Indeed, Bonnen (1975) has argued that the problems of mathematicians are fundamental to those of information processing which in turn are, the problems of the appropriate design of the information systems within which data are collected, analyzed and acted upon by decision makers. The performance of the mathematicians in the economy of Nigeria is evidently unsatisfactory. Among other reasons is the low level of information and communication technology among mathematicians in Nigeria, lack of free access to electronic technology and ineffective use of libraries (Idowu 2002). It follows therefore that the availability of information and its quality are critical to mathematical teaching and learning process and the well being of learners and indeed, all mankind (Awasom 1995). The production of scientific literature started its exponential growth as far back as the beginning of the 20th century.

Mathematicians use information for acquisition of knowledge (as in the case of teachers and research scientists) for decision making and for current awareness to keep up-to-date, and to acquire more knowledge they consult the libraries for books and journals, newspapers, etc. They consult their colleagues or bosses. They also acquired information through oral communication, attend workshops, seminars, community talk, conferences etc.

The stated growth and positive results in teaching and learning mathematics today cannot be divorced from the importance of information to the different aspects of mathematics. This "information" is the key to the development and success achieved, and is part of every aspect, such as research, economics, etc. It is thus apparent that in order to obtain the information required that information has to be sought for. Information seeking behaviour of mathematicians is therefore important to be studied in order to find out the gaps that may exist

in their methods or information seeking or improvements that can be made to what has already been acquired. This would no doubt reinforce and even increase the positive results already achieved in African science particularly in mathematics.

The following are areas of mathematics where information is greatly required:

i. Mathematicians need information on past, present and future research. This also applicable to mathematical libraries and information providers.

ii. Educators and students at all levels, need information on current practices and issues, while those in the industries and the economists need immediate access to new standards, techniques and procedures, patents and products details, trade information, market intelligence and outlook statements (market trends).

iii. Policy maker/administrators in government and private industry, their needs include information about the production level, use of resources, market outlook and national outlook

iv. Mathematicians service industry personnel, need information on market trends, research results, new practices and government policies, product estimates and prospects for mathematician industries. The primary factors determining the information needs of mathematical Personnel are their function and working environment, geographical location and political factors.

Research has shown that journal articles were the most preferred information source by scientists and technologists (Majid, Anwar and Eisenschrtz, 2000; Sam, 1996: Folster, 1995: Han, 1993; Mwila, 1993). Also, nontraditional literature such as unpublished conferences and symposia papers, research proposals, policy guidelines, and project reports were equally popular among scholars {Prasad, 1998). Other studies have also suggested that Mathematicians beside using formal information communication sources, rely heavily on informal and interpersonal Information channels to exchange information with their colleagues (Njdngmota & Ehikhamenor, 1998; Omekwu, 1998; Ready and Karisddappa, 1997; Eager and. Oppenheim, 1996). It was also realized that mathematicians meetings were not most frequent, occasions for face-to-face contact between scientists and mathematicians to exchange valuable ideas. Scientific information-showing that personal communications were important as scientists could get useful information far before it was published (Grcsheim, Franklin and Cunningham, 1991).

According to Fidzani (1998), the presence of electronic communication facilities such as e-mail, discussion groups, bulletin boards, electronic conferencing,, chat, etc have opened new channels of communication (Fidzani 1998; Kuruppu 1999). As such, the advancements in computer and telecommunication technologies have opened new vistas fort information creation, supplication, storage, access, distribution, and presentation. Consequently, the information technology revolution is expected to bring significant changes in information seeking behavior of users (Kurppu 1999; Pelzer, Wiese and Leysen, 1998). Adedigba (1985) found that most Nigerian mathematicians used their institutions libraries only and that they mainly used special textbooks and professional journals to meet their information needs. Majid et al, (2000) revealed that Malaysian researchers spent sixteen percent of their time for reading relevant materials.

Dulle (2002) believes that Tanzanian mathematicians use personal libraries, professional meetings and periodicals as their major information sources.

Allen Foster (2005) presented a summary of a recent study, which sought answers to three basic questions relating to the activities of inter-disciplinary researchers, the relationship of processes and contexts, and the representation of these in an empirical model of interdisciplinary information seeking behaviour. Foster addressed this in full through the identification of behaviour and strategies present in the description of the non-linear model. The extent in which previous research can point to the value of both internal context and external context alongside individual activities to enable a holistic portrait of information-seeking behaviour. The behavior he identified emphasizes the variety of approaches in use, while also indicating that these are flexible and fully understandable within a view of changing contexts. This enhances the available perspectives with which information-seeking behaviour may be viewed. Foster's second and third research questions were answered through development of the model. His model considers new aspects of interdisciplinary. Activities and behaviour have some crossover with existing models, and gain strength through this connection, although the relationship of activities in this holistic context highlights different aspects of importance and leads to new ways to approach human information behaviour.

Bronstein (2007) reviewed information seeking behaviour of Jewish scholars through the information activities used at each research phase. He said the model of information behaviour proposed by Wilson is a problem solving model that describes the information seeking process as an attempted to resolve the user's state of uncertainty created by a 'problematic situation (Wilson 1999). According to this problem solving process, users will engage in specific information activities at different stages of the process that will help them), identified two action lines that are needed in retrieving information. On the one hand, information retrieval research needs to be extended to capture more contexts. The real issue in information retrieval systems design is not whether its recall-precision performance goes up by a statistically significant percentage. Rather, it is whether it helps the actor solve the search task more effectively or efficiently. They said it is necessary to learn how the actors can be helped. Sangeetha and Nambi (2004) carried out a research work on "Information seeking behaviour of Faculty Members from Government Arts Colleges in Cuddalorc District." The purpose of their study was to investigate how faculty members seek information from the library. They mentioned that most of the respondents 61 (38.12 percent) visited the library several times a week to meet their information needs. Regarding the type of search made by the respondents the majority of the-respondents 91 (56.87 percent) made their search by subject. Shokeen and Kushik (2002) studied about information seeking behavior of social scientists working in the universities located in Harvana. They reported most of the social scientists visit the library daily. The first preferred method of searching the required information by the social scientists, followed by searching through indexing and abstracting periodicals and citations in articles respectively.

Purpose of Study

However, since the previous studies established significant of mathematics teachers' information behaviour, but no one has ever established the effect of teachers' information seeking behaviour and utilization on students performance in mathematics. Mathematics teachers in Nigeria: need information for acquisition of knowledge, for decision making in class, for current awareness to keep up-to-date. These will go a long way to improve qualities of teaching and learning mathematics. The information seeking behaviour of mathematics teachers also improve students' learning process, since teachers (mathematics) adopt varying methodologies and qualities of information given to students

As mentioned above, the problems of mathematicians are fundamental to those of information processing which in turn are, the problems of the appropriate design of the information systems. Information seeking behaviour of mathematics teachers is therefore important to be studied in order to find out the gaps that may exist in their methods, improvements that can be made to what had already been acquired. This would no doubt reinforce and even increase the positive results of their students. Nevertheless, this paper resolves their state of uncertainty and that: The performances of secondary schools students in mathematics and in major examinations like UME, NECO, WASSCE in the recent past, were poor. The reasons for this poor performance are not farfetched. For instance, there has been fast growing of information being produced through researches. This fast growth makes it difficult for individual teachers to seek and find information necessary for them in the performance of their duties. This situation is further compounded by the inability of the available information centers and libraries to meet the information needs of the teachers.

A lot of studies have been conducted to determine how other professionals such as Agriculturists, Nurses, Doctors, Engineers, Communicate and get information, but far less has been done for secondary school teachers. It is the belief of this paper that this survey will bridge the gap and contribute to the fields of information science. This will enable stakeholders in education to know the types of information teachers need in the discharge of their duties and how to access such information can be facilitated and useful for the better performance of students in their care. The findings from this study will serve as catalyst to the government in increasing budgetary allocations to the education sector as well as provide concrete information that will aid in the decision to provide facilities such as textbooks, library and laboratory equipment that will boost the teaching and learning processes.

Finally the outcome of this study will facilitate the creation of a dynamic school curriculum, that will help both the teachers and the students acquire knowledge (through adequate and up-to-date information). This will help them to be self-developed, self-reliant and be able to solve their problems in life.

Is information seeking by the teachers improving their classroom practices? What are the implications of teachers' information utilization to pedagogical practices? These are the posers the study intends to empirically seeking answers to.

Research Questions

1. What is the information seeking behaviour of mathematics teachers ?

2. Is there a significant composite and relative effect of teachers' characteristics on information utilization?

3. Is there a significant relationship between students' performance in mathematics and teachers' information seeking behaviour and utilization in mathematics?

4. What is the composite and relative of contribution of students' characteristics to measure performance in mathematics.

Statement of Hypotheses

H01 Information- seeking behaviour and information utilization of mathematics teachers when taken together will not significantly predict the performance of the students in mathematics

H02 Information - seeking behaviour and information utilization of teachers in mathematics contribute to the performance of students in mathematics

Research Design

An ex-post facto research design was used in which the relationship among information related variables and performance in mathematics were established. Though, in this design one cannot manipulate or assign subjects or treatments because the independent variable had already occurred (Kerlinger, 2004).

Population of Study

The study population was made up of all mathematics teachers in senior secondary schools and all SS II students in the whole of education districts in Lagos state.

Procedure and Sampling

Sampling: The sample consists of 400 SSS 2 students selected from all education districts in Lagos state and 100 teachers were selected from all schools in the districts. The districts were divided into 20 educational zones (zone stratification). Multi stage stratified random sampling was used to avoid interclass mixed. 50% proportionate on each zone and stratified simple random sampling technique was adopted to give non mixed schools within the zones equal chance of being taken. 30 percent proposion of the students were chosen from each educational zone with the same number of male and female to give the total of 400 subjects from 20 educational zones..20 teachers were chosen in each education zone to give the total of 100

teachers used for this study. ISBUQ was conducted in each school for 4 weeks in the whole of the zones for the teachers.

Procedure: Stratified random sampling technique was used to select teachers and students as samples. This technique was adopted because of the heterogeneous nature of the population for reducing the sampling cost, for improvement in precision of estimates and for administrative convenience. Proportionate stratified random sampling method was used to select 400 (four hundred) SS II students and 100 (one hundred) mathematics teachers in the whole state.

Research Instrument

Information seeking behaviour and utilization questionnaire (ISBUQ) was used as the main tool for data collection by teachers. The responses of teachers were correlated with the SSS 2 students mathematics scores selected from their SSS I first, second and third terms scores in mathematics. The major variables identified for the instrument were those in the response questions focused on. Instrument (ISBUQ) was personally administered in the selected schools by the researcher. Ten Senior Secondary Schools in each district in Lagos State were used. Because the teachers in these schools share the same characteristics, the inclusion of the remaining schools will not make a significant difference from others. However, the ten selected schools comprise seven public schools and three private schools in each district. The public schools are the schools owned by the state government, while private schools are the schools owned by individual or missions. The reliability of SSS 1 Mathematics scores was established using Kuder Richardson formula 21 found to be .88. The ISBUQ constructed with the reliability using Cronbach's alpha to be .89.

Results

Table 1 shows that most of the respondents used many sources to access information. The most important source of information was derived from reading list (Mathematics textbooks) at 86.7% teachers using them regularly. The responses from colleagues column shows that 68% of the respondents discussed and sources information from colleagues, 40% of respondents interact with other mathematics teachers. 65.5% of the respondents do not or never sources their information from the internet. This is for higher than those who source regularly and occasionally at 13.2% and 21.3% respectively.

Table 1. Frequency of Consultation of Information Sources by the Respondents

Source	Regularly	Occasionally	Never
Newspaper	42.2%	31.1%	26.7%
Colleagues	68%	31%	1%
Courses, workshops, Meeting, Seminars	38%	39.1 %	22.9%

Interaction with other mathematics teachers	40%	31%	29%
Ministry's or Tescom publication / professional journals	7.9%	20.2%	71.9%
Internet	13.2%	21.3%	65.5%
Reading the mathematics books	52 (86.7%)	6(10.0%)	2 (3.3%)

Table 2 shows frequency that 73.5% of the respondents face one problem or the other in accessing information from internet due to lack of such facility in schools.

Table 2. Frequency of Information Sources / Hindrance or Constrains

Accessibility problem	5.0%
No internet facilities in schools	73.5%
Mathematics reading materials are not available	0.1%
Library / information centre not available	21.4%

Table 3 Regression Model Summary

Model	R	R Square	Adjusted Square	Std. Error of the Estimate
1	0.204 a	0.042	.00I	5.45

a. predictors: (Constant), Teachers information source, information seeking behaviour and information utilization.

Table 4. ANOVA [b]

Model	Sum of squares	Df	Mean Square	F	Sig
Regression	123.093	4	30.773	1.035	.393a
Residual	2824.067	95	29.727		

Total	2947.160	99

a. Predictors: (Constant), Teachers information sources, information seeking behaviour information utilization.

b. Dependent variable: Students performed in mathematics behaviour

Table 5. Coefficients a

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	Sig
(Constant)	28.753	2.191		13.122	.000
Teachers information source	-.933	.563	-.194	-1.656	.101
Information seeking behaviour	1.199	1.105	.120	1.085	.281
Information Utilization	2.965E − 02	.626	.006	.047	.962

a. Dependent variable: Students performance in mathematics

However the combination of these variables (Teachers characteristics) as shown by the coefficient of determination ($R^2=0.042$). The $F_{4, 99} = 1.035$, P >0.05 shows value of regression of .204 in Tables 3 and 4 (P > 0.05) is not by chance. This implies that there was no significant effect of predictors in the Tables (3 & 4). Table 5 coefficients shows that, teachers information sources and information seeking behaviour had significant effect, as each entity on a variable (dependent variable).

Discussion of Findings

The aim of this research was to establish correlations of teachers information seeking behaviour and information utilization on performance in mathematics. The findings, which emerged as a result of research being carried out, were placed within the framework of previous previewing studies and the discussion of the students results of this study were established by the research hypotheses raised in the study.

Table 1 showed that the most important list and 65.5% never source their information from the internet. And Table 1 reflected that 60% of mathematics teachers source information through libraries and information centers. The frequencies Tables 1and 2 indicated that there are many factors contributed to the performance of students in mathematics such include mathematics teachers information seeking behaviour, information utilization in schools, teachers information

sources (Majority of mathematics teachers in Lagos State source their information from colleagues, and basically rely on reading list, that is, mathematics books recommended for the students) were not in line with modern techniques, that is, sourcing information through electronic devices like internet. The Table 1 shows that 86.7% used mathematics text books regularly. 73.5% of mathematics teachers in Lagos State had one constrain or the other in using internet in schools, problems of accessibility of information through libraries, information centers and lack of internet facilities in school. These were among other factors contributed to the teaching of mathematics and performance of students in mathematics in Lagos State. These assertions were in line with Wiberly and Jones (1989) which states that: information seeking is a basic activity indulged in by all people and manifested through a particular behaviour. It is also an aspect of scholarly work of most interest to academicians who facilitates information seeking through organizational structures.

The need to be informed and knowledgeable individuals leads to the process of identifying information needs. This process does not work without finding out how individuals articulate, seek, evaluate, select and finally use the required information, commonly referred to as information seeking behaviour (Zawawi and Majid, 2001). The understanding of information needs and information seeking behaviour of various professional groups is essential as it helps in the planning, implements and operation of information systems and services in a particular work setting. Tables 3, 4 and 5 (regression model summary, ANOVA[b] and coefficients[a]) respectively showed that teachers information sources and information seeking behaviour had significant effect on dependent variable (students performance in mathematics). These showed that teachers information seeking and utilization goes a long way to enhance teaching of mathematics and facilitate learning of mathematics.

Regression model summary, ANOVA[b] and coefficients[a] respectively showed that teachers information seeking and information behaviour had significant effect on students performance in mathematics. These showed that teachers information seeking and utilization go a long way to enhance teaching of mathematics and facilitate learning of mathematics. This also showed that information needs and information seeking behaviour of various professional groups were essential as they help in the planning, implements and operation of information systems and services in a particular work setting.

However, Foster (2005) presented a summary of a recent study, which sought answers to three basic questions relating to the activities of inter-disciplinary researchers, the relationship of processes and contexts, and the representation of these in an empirical model of interdisciplinary information seeking bahaviour. He addresses this in full, through the identification of behaviour and strategies present in the description of the non-linear model. These extend previous research and point to the value of considering both internet context and external context alongside individual activities to enable a holistic portrait of information-seeking bahviour. The behaviour he identified emphasizes the variety of approaches in use, while also indicating that these are flexible and only fully understandable within a view of changing contexts. This enhances the available perspectives with which information seeking behaviour may be viewed. His second and third research questions were answered through development of the model. His model considered new aspects of interdisciplinary. Activities

and behaviour had some crossover with existing models, and gain strength through this connection, although the relationship of activities in this holistic context highlights different aspects of importance and leads to new ways to approach human information behaviour and mathematical problems

Bronstein (2007) reviewed information seeking behaviour of Jewish studies scholars through the information activities used at each research phase. He said the model of information behaviour proposed by Wilson is a problem solving model that describes the information seeking process as an attempted to resolved the user's state of uncertainty created by a *'problematic situation'* as a case in mathematics (Wilson 2006 : 260). According to this problem solving process, users will engage in specific information activities at different stages of the process that will help them resolve their state of uncertainty.

Jarvelin and Ingwersen (2004) identified two action lines that are needed in retrieving information. On one hand, information retrieval research needs to be extended to capture more contexts. The real issue in information retrieval systems design is not whether its recall-precision performance goes up by a statistically significant percentage. Rather, it is whether it helps the actor solve the search task more effectively or efficiently. They said it is necessary to learn how the actors can be helped certainly is possible to do more than just allow a window for entering two keywords. Inability of teachers to seek adequate information through internet and other information centers such as libraries resulted into non coverage of scheme of work and also creates a sense of in competency on the part of teachers (Olatoye, 2005).

Implications of Findings for Pedagogical Practices

This study seems to have profound implications for teaching and learning mathematics and how to facilitate information through internet to support mathematics teaching among teachers. The focus of this study has been to establish the relationship, between teachers' and students' characteristics, information seeking behaviour and information utilization as predictors to students performance in mathematics.

Some of the features of this study are:

- Inadequate instructional materials in schools particularly internet.
- Teachers are poorly remunerated.
- Lack of awareness among the teachers about the usefulness of internet to support their teaching.
- Non coverage of scheme of work on the part of the teachers.

It is therefore suggested that: government should try as a matter of policy to put into law the use of Information Technology (IT) in support of teaching and learning. Co-operation of parents with school authorities in provision of internet facilities to support government effort. Effort should be made to train teachers from time to time on the use of internet (IT) in sourcing information and support teaching and learning for the ultimate purpose of producing quality students.

Conclusion

Understanding of teachers information seeking behaviour and information utilization are steps towards effective teaching and taking steps to correlates understanding of teachers information needs to students performance can best be achieved through provision of adequate internet materials and supported (IT) facilities that enhanced teaching and learning in schools. Effort should be made to redesign training strategies of teachers to improve them on information skills development and information source awareness.

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