The Effect of Tacit Knowledge for Effective Teaching and Learning of Computer Science Processes, among Lecturers at Alvan Ikoku Federal College of Education, Owerri

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Abstract— The study was carried out to look at the effect of tacit knowledge for effective teaching and learning of computer science processes among lecturers at Alvan Ikoku Federal College Education (A.I.F.C. E), Owerri, Imo State Nigeria. The searcher is to look in to teacher's awareness of tacit knowledge, staff training in tacit knowledge among lecturers and to emphasis the need for adequate infrastructure. A descriptive survey research design was used for the study, all together fifty lecturers from the department of Computer Science, Information Technology and Communication (ITC), and General studies, were used as a sample size. A questionnaire was used to collect data. A simple percentage was used for analysis of data. The research findings revealed that not all lecturers are aware of what tacit knowledge is in A.I.F.C.E, There is need for faculties and departments to organize staff/lecturers training programme to boost lecturers' tacit knowledge, there are infrastructures to harness tacit knowledge, that tacit knowledge is a tool for effective teaching and learning process.

Index Terms— Tacit knowledge, Infrastructures, Computer Science, Lecturers.

I. INTRODUCTION

Because of the importance of tacit knowledge, more and more researchers have tried to open the black box of tacit knowledge in the field of education. [6] realized that tacit knowledge is very important in the field of education, especially for teacher education, because "the knowledge base of teaching is potentially relevant to teachers' activities", and "teachers' knowledge is strongly related to individual experience and teaching context" .

Therefore, we cannot ignore the concept of tacit knowledge in the field of education. [4] found that the most important part of teachers' knowledge is not the subject knowledge but the unarticulated pedagogical knowledge, although the researchers and policy-makers always emphasize the importance of the teachers' subject knowledge. The research shows some teachers still do not teach well even though they possess very rich subject knowledge.

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Therefore, Poulson suggested for "the researchers and policy-makers to reconsider their current emphasis on teachers' subject knowledge" [4] and pay more attention to "the relationship between teachers' unarticulated tacit knowledge and formal knowledge"[4], as teachers' tacit knowledge plays a more important role in the teaching activity.

[2] detected that teachers in England are always expected to have a better professional knowledge about school management and teaching, which demands the creation of such kind of professional knowledge. The British government expects that the university-based institutions can create the new professional knowledge and then disseminate it to the teachers in school [2]. However, they overlook one important character of this kind of professional knowledge: the most professional knowledge that teachers should have cannot be taught or shared with each other, as it belongs to tacit knowledge and it is inarticulate [2]. This kind of knowledge should be created and learned by doing rather than from the theories that university researchers produce [2]. That is the reason why university-based researchers are not very successful. Therefore, the task of knowledge creation should be located in school rather than in university institutions [2]. [2] also proposes some useful suggestions about how to create an effective knowledge-creating model in education. For example, [2] found that the related research results from the high technology firms are also very suggestive in education. We should consider exploring and learning these existing models from the business and management field to use in education [2].

[1] examined how the teacher education program influences the teachers' conceptions or understandings of teaching by describing the changes of four teachers' conceptions of class practice in an 18-month long teacher training program. As the understanding or conception of teaching is tacit or intuitive, one of the main purposes of the teacher education program is to help teachers make their tacit understanding become explicit [1]. In this research, [1] found that the teacher education program has strong influence on teachers' development of teaching understandings, as it is useful to help teachers to express and articulate their tacit understandings and conceptions of teaching practice. The research results show that teachers can express more about teaching after participating in the program [1]. I think this may be because the program provides more opportunity to

teachers to let them talk about or discuss their understandings of teaching, or the teacher educators can help teachers to organize wha1t they want to express and make their expression fluent.

There are also some researchers in the field of education who try to analyze the knowledge structure of experts in order to reveal the nature of tacit knowledge. For example, [3] analyzed the knowledge structure of experts in order to promote the transformation between tacit knowledge and other kinds of knowledge. In the paper titled "Tacit Knowledge in Expert Coaching, Science or Art?", [3] described the obvious characteristics of expert coaches and emphasized the tacit nature of this kind of expertise and skills in coaching. They presented the tacit knowledge of coaches by analyzing the knowledge structure of expert coaches [3]. There are three kinds of knowledge: sport specific, pedagogy and "ologies", which constitute the coaching knowledge by integrating each other [3]. "Coaches would be expected to have similar declarative knowledge about the specifics of their sport: tactics, training techniques as well as similar procedural knowledge regarding the pedagogical process.

Coaches must also make use of the 'ologies,' i.e., psychology, physiology, kinesiology, and sociology to improve the performance of their athletes" [3].

Besides this, they also tried to analyse how the expert coaches gain their coaching knowledge, as "the lack of a clear development pathway for aspiring expert coaches is a clear indicator that the current coach education system needs review" [3]. As "tacit knowledge is knowledge gained primarily from experience performing practical, everyday problems" [3], they suggested that "in the design of coach education courses, much more time should be allocated to developing this procedural knowledge base, which coaches require to improve their athletes" [3]. For example, the coaches should be allowed and encouraged to ask questions like, "What do I do?", "How do I do it?", "Where do I get the knowledge?" [3]. I think as tacit knowledge is related to teachers' teaching experience, we can encourage teachers to expose their experience and teaching stories, which might be useful for the clarification of tacit knowledge. [3] analyzed the structure of coaching knowledge and presented a model of it, which is very meaningful for coach educa- tion. However, they emphasized the tacit nature of expertise of expert coaches, but did not present the nature of tacit knowledge.

[5] also analyzed the knowledge structure of teachers by categorizing their knowledge base. He thinks there are seven categories of professional knowledge that teachers should have: "content knowledge", "curricular knowledge", "pedagogical content knowledge", "general pedagogical knowledge", "knowledge of learners and their characteristics", "knowledge of educational contexts" and "knowledge of educational ends, purpose and values" [5]. "Among those categories, pedagogical content knowledge is of special interest because it identifies the distinctive bodies of knowledge for teaching. It represents the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction" [5]. In other words, pedagogical content knowledge is about how teachers translate the content knowledge into the special understanding that the students can accept and learn effectively.

A. Statement of the Problem

Tacit knowledge is the knowledge which every human being possesses for everyday activities but some of the difficulties encountered in its use in education include: lack of awareness of tacit knowledge among lecturers, lack of staff training in tacit knowledge among lecturers, inadequate infrastructure for harnessing tacit knowledge among lecturers, and selfish interest of lecturers in knowledge sharing/tapping. It is against these that this research tend to investigate the effect tacit knowledge has in teaching and learning process among lecturers at Alvan Ikoku Federal College of Education, Owerri Nigeria

B. Purpose of the Study

The purpose of this study therefore is to point out the effect of tacit knowledge and how it has effectively helped lecturers in their teaching and learning processes at the A.I.F.C.E,

i To create an awareness of tacit knowledge/sharing among lecturers.

ii To determine the importance of effective and efficient staff training in tacit knowledge among lecturers.

iii To point out the need for adequate infrastructures for harnessing tacit knowledge among lecturers.

iv To investigate the extent of selfish interest of lecturers in knowledge sharing/tapping.

C. Research Question

In line with the identified problems above, the following research questions were raised:

i To what extent are lecturers aware of tacit knowledge?

ii To what extent are lecturers trained in tacit knowledge?

iii Are there adequate ICT infrastructures for harnessing tacit knowledge e among lecturers?

iv Why are lecturers selfish in knowledge sharing/tapping?

D. Significance of the Study

This study becomes significant to lecturers, consultants, students, researchers, etc., at AIFCE Owerri, and beyond, hence helps to explore and improve on their potentialities in discharging their teaching and learning processes at various capacities. It will help in research writing and attending of conferences and workshops. It will equally serve as a tool for other researchers who might want to embark on similar research.

II. TYPESOF ICTs/TECHNOLOGIES USED BY LECTURERS FOR TACIT KNOWLEDGE SHARING

Sharing tacit knowledge is an important component of the knowledge management. Tacit knowledge exchange or

sharing between lecturers and students could be enhanced through the use of information and communication Technology (ICT) such as electronic networks, e.g., Internet, intranets, and group support systems. In these setting lecturers and students exchange knowledge via:

Although technology promises new ways of promoting knowledge sharing, educators' reactions to it have been mixed. Computers are creating new opportunities for writing, collaborating and sharing knowledge. Historically, there have been a number of technologies facilitating knowledge management practices in the organization, including expert systems, knowledge bases, various types of information management, software help desk tools, document management systems and other IT systems supporting organizational knowledge flows. The advent of the Internet brought with it further enabling technologies, including e-learning, web conferencing, collaborative software, content management systems, wikis, blogs, and other technologies. Each enabling technology can expand the level of inquiry available to an employee, while providing a platform to achieve specific goals or actions. The practice of KM will continue to evolve with the growth of collaboration applications, visual tools, and other technologies.

III.   METHOD

The research design adopted for this study was descriptive survey research design which tends to describe the effect of tacit knowledge for effective teaching and learning processes among lecturers of A.I.F.C.E, Owerri. The variable will enable us to know the extent to which tacit knowledge has helped lecturers in their research and teaching profession. The population consists of lecturers of Computer science, information communication and technology and finally General studies departments at AIFCE, Owerri. The sample size is drawn from the lecturers of the various departments mentioned above. The purposive sampling technique was used to select 50 (fifty) lecturers who were the respondent. The instrument used to gather data for this research work is the questionnaire which was personally administered by the researcher by hand to respondents. The simple percentage and frequency counts statistical tool was used to interpret the data collected from respondents.

IV.   RESULTS

A. Table 1: Gender of the Respondents

Gender	Response	Percentage%
Male	30	28
Female	20	15
Total	50	43

The sex distribution of the respondents in Table 1 shows that male have the highest percentage of (28%) while that of female is (15%). This shows that majority of the respondents were male.

B. Table 2: Work Experience of Respondents

Working experience	Response	Percentage%
1-5years	10	20
6-10years	25	50
11years and above	15	30
Total	50	100

The data in table 2 shows that 10(20%) of the respondents have a working experience of 1-5years, 25(50%) of them has 6-10years experience, while 15 (30%) of them have spent 11 years and above as lecturers. This result shows that the respondents are well experienced in the teaching and learning process and can answer questions regarding tacit knowledge.

C Table 3: Department Distribution of Respondents

Department	Responses	Percentage%
Computer science	20	40
ICT	15	30
General Studies	15	30
Total	50	100

Table 3 above shows that 20(40%) of the respondent are from the department of Computer science 15(30%) are from ICT, 15(30%) from General studies respondents. This result shows that Computer science responded more while ICT and General studies have the least respondents.

D Research Question One: To what extent are lecturers aware of tacit knowledge?

Table 4: Lecturers awareness of tacit knowledge.

Determinant:	yes	%	No	%	Total	Total%
Table (i) Do you know what tacit knowledge is as a lecturer?	35	70	15	30	50	100
Table (ii) Do you lecture with your tacit knowledge as a lecturer?	45	90	05	10	50	100
Table (iii) Do you see						

tacit knowledge as a tool for effective teaching and learning process as a lecturer?					
	50	100	0	0	50	100

The above table shows that most lecturers know what tacit knowledge is and they lecture with their tacit knowledge. From the analysis, it is glaring that tacit knowledge is a tool for effective teaching and learning process among lecturers of AIFCE, Owerri as shown by the records and percentages of yes compared to number from the table (i) 35(70%) of the respondents says that they know what tacit knowledge is while 15(30%) of the respondents says they don't known what it is/they've not heard of it before. In table (ii), 45(90%) of the respondent says they lecture with their tacit knowledge while 5(10%) of the respondents says they don't lecture with their tacit knowledge. finally, 50(100%) of the respondents in table (iii) sees tacit knowledge as a tool for effective teaching and learning process while 0(0%) says No.

E. Research Question Two: To what Extent Are Lecturers Trained in Tacit Knowledge?

Table 5: Staff Training in Tacit Knowledge among Lecturers?

Determinants	yes	%	No	%	Total	Total%
Table (iv) Does your department organize staff training programme to assist improve on their tacit knowledge?						
	0	0	50	100	50	100
Table (v) Can you mention some of the staff training programme organized by your department?						
	0	0	50	100	50	100

The above table 5 shows that no staff/lecturers training programme are organized in any department to improve the tacit knowledge of the lecturers as responded by the respondents. In table (i), 0(0%) says staff training programme is organized in their departments while 50(100%) of the respondents says that no staff training programme is organized in their departments to assist lecturers improve on their tacit knowledge. From table (v) 0(0%) of the respondents can mention some of the staff training programme while 50(100%) of the respondents says they don't know any staff training programme that is worth mentioning in their departments. From the above table, it is evident that a lot of effort needs to be made by the various departments and faculties to train lecturers on how to use and improve on their tacit knowledge to help them teach effectively and efficiently.

F. Research Question Three: Are there Adequate Infrastructure for Harnessing Tacit Knowledge among Lecturers?

Table 6: Infrastructure for Harnessing Tacit knowledge

Determinant	yes	%	No	%	Total	Total%
Table (vi) As a lecturer, do you improve on your tacit knowledge?	**45**	**90**	**05**	**10**	**50**	**100**
Table (vii) Do you have adequate						

infrastructure for harnessing your tacit knowledge?					
35	70	15	30	50	100

The above table shows that most lecturers work hard to improve on their tacit knowledge in Alvan Ikoku Federal College of Education, Owerri. Table (vi) shows that 45(90%) of the respondents improve on their tacit knowledge while 5(10%) of the respondents feels it is not important to improve on their tacit knowledge. From table (vii) 35(70%) of the respondents says they have adequate infrastructure for harnessing their tacit knowledge while 15(30%) of the respondents says there is no adequate infrastructure to help them improve on their tacit knowledge.

Finally, table (viii) shows some infrastructures as stated by the respondents in the above table.

G. Research Findings

In the course of this research, the following were reached.

1. That not all lecturers are aware of what tacit knowledge is in Alvan Ikoku Federal College of Education, Owerri.
2. There is need for faculties and departments to organize staff/lecturers training programmes to boost lecturers' tacit knowledge.
3. That there are infrastructures to harness tacit knowledge.
4. That tacit knowledge is a tool for effective teaching and learning process..

V.   RECOMMENDATIONS

In view of the findings, the following recommendations were made:

1. There is need for staff training programmes in various departments to enable lecturers enhance on their tacit knowledge. Training programmes like conferences, seminars, symposiums, short courses, group interactions, workshops should be organized.
2. The lecturers should make use of infrastructures like internet, computer, critical thinking and reading discipline-oriented books and journals to improve their tacit knowledge.
3. The lecturers should teach with their tacit knowledge, this will enable the students learn and understand faster than just reading from textbooks.

VI.   ACKNOWLEDGMENT

REFERENCES

[1] Freeman, D. (1991). "To Make the Tacit Explicit": Teacher Education, Emerging Discourse, and Conceptions of Teaching. Teaching and Teacher Education, 7(5), 439-454.

[2] Hargreaves, D. H. (1999). The Knowledge-creating School. British Journal of Educational Studies, 47(2), 122-144.

[3] Nash, C., & Collins, D. (2006). Tacit Knowledge in Expert Coaching: Science or Art? Quest, 58(4), 465-477.

[4] Poulson, L. (2001). Paradigm Lost? Subject Knowledge, Primary Teachers and Education Policy. British Journal of Educational Studies, 49(1), 40-55.

[5] Shulman, L. (1987). Knowledge and Teaching: Foundations of the New Reform. Harvard Educational Review, 57(1), 1-23.

[6] Verloop, N., Van Driel, J., & Meijer, P. (2001). Teacher Knowledge and the Knowledge Base of Teaching. International Journal of Educational Research, 35(5), 441-461.