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An Investigation on the Challenges Faced in Teaching and Learning Computers in Higher Education

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***Abstract* - The study set out to investigate the challenges faced in teaching and learning computers in higher education with specific reference to Great Zimbabwe University (GZU). The study adopted a mixed approach and a sample of 30 was used. Data was collected through interviews and focus group discussions. The study revealed that a number of challenges were experienced in teaching and learning of computers. Such challenges could be tutor, student, school, or resource related. Based on research findings the researcher recommended that universities should engage in private public partnerships in a bid to mobilise resources and also continuously equip tutors for the demanding job of teaching computers in higher education.**

Key words: Computers, Teaching, Learning, Challenges

INTRODUCTION

Teaching and learning of computers, especially practical subjects has never been that easy. Computer programmes are offered at different levels from preschool to higher education. Computer curriculum is available taking pupils from an early stage to higher levels of education. Computer Science subjects such as programming, database development and artificial intelligence (AI), are challenging to both the instructor and the learner due the fact that learners are expected to improve a range of both theoretical and practical skills [1]. Studies conducted indicate that learners in such courses have challenges in comprehending abstract issues [2].

Computer Science is seen as an area of instruction that demands complex conceptual knowledge, appreciation and is highly technical and practical in nature. The appreciation of critical abstract concepts that underpin the development of a programming mindset brings more problems to teaching and learning than in other areas [3]. Computer Science students learning programming as a subject, must develop competence in several cognitive faculties such as syntactic knowledge and conceptual knowledge [1]. They then need to develop methods and use their problem-solving skills to creatively solve programming problems or to create new programs [4]. Reference [2] reiterate that cognitive development and the development of conceptual understanding rarely occurs in an isolated environment, hence, studying Computer Science topics is very difficult for the students who may be studying in isolation.

Programming languages uses highly technical syntax, with complex rules. Like all language learning, computer programming languages are not easy to learn and understand [1]. Most novice programmers find introductory programming courses frustrating and difficult to learn [5]. The foregoing highlights challenges faced in teaching computer science. In view of this backdrop it has been noted that there is a need to conduct a study on the challenges faced at university level. The assumption is as learners go in higher education, more demanding issues emerge.

This is happening at a time when academic administrators are increasingly pushing for academic staff to be teaching whilst incorporating technology for more active learning [6]. Hence there is a tremendous need to demystify the deterrence to the teaching and learning of computers. Technology helps the educator and the student make connections to content, context, and community which in turn results in more powerful learning experience [7]. Technological advancement has fostered opportunities to learn anytime, anywhere and anyhow which is a great advantage [8].

Statement of the problem

Computer studies is done in Zimbabwe from a tender age to higher education depending on the school and availability of resources. Schools are offering this as a subject. Like any other area computer teaching and learning cannot be experienced without challenges. The problems are experienced by both teachers and learners. It is in view of this backdrop that a study has to be done verifying on challenges faced by students in higher education.

Research Questions

Main research question

What challenges are faced in computer teaching and learning?

Sub questions

What are teacher related challenges faced in teaching computers at GZU?

What student related challenges faced in teaching computers at GZU?

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What are school related challenges faced in Computer teaching at GZU?
How can the challenges be addressed?

RESEARCH METHODOLOGY

The study adopted a mixed approach but largely qualitative. It used both quantitative and qualitative approaches. A case study research design was applied that is a case for computer science teaching at GZU. A case study entails a closer examination of a problem under study being challenges of computer science teaching at GZU. The case study facilitated collection of rich in-depth data from the field. The population for this study was drawn from GZU department of Accounting and Information systems. A sample of 3 lecturers and 27 students was used.

Participatory approach was used to collect data. The study engaged participants through focus group discussions and interviews. Collected data was analysed qualitatively and quantitatively. Observation and Interview responses were interpreted qualitatively in the form of summaries, descriptions and explanations. Quantitative tables and graphs were also used to describe numerical data collected. Summaries and descriptions were employed where necessary.

RESULTS AND FINDINGS

The following focuses on presenting findings from lecturers and students on challenges faced in teaching and learning computers.

RESPONSE	A		SA		N		D		SD	
	f	%	F	%	F	%	F	%	f	%
Lack of time for computer lessons	10	37			7	26	10	37		
Tutors not explaining to us	5	18.5	5	18.5	7	26	5	18.5	5	18.5
Teaching approach of teachers is not good	4	15	1	4	15	55	3	11	4	15
The school does not support us in doing computers	7	26					20	74		
Poor attendance in computer lessons	7	26					20	74		
I find it difficult to learn computers	8	30	2	7	7	26	7	26	3	11

Table 1: Student Challenges Response Statistics

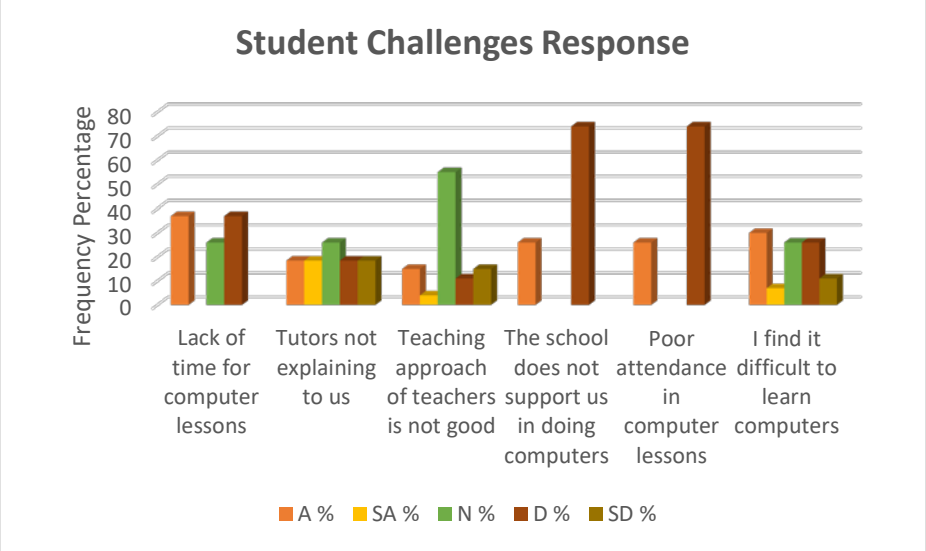

Figure 2: Student Challenges Response

Challenges faced according to students varied. Some 10 (37%) revealed that they lacked enough time for computer lessons, 7 (26%) remained neutral and the other 10 (37%) disagreed. From this it can be noted that it was not clear on whether students were affected by the issue of time or not. An attempt to establish if tutors managed to explain computer concepts to learners was also made and mixed responses were obtained 5 (18%) agreed and strongly agreed respectively that teachers could not explain the computer concepts whereas 5 (18%) disagreed and strongly disagreed that tutors could explain whereas 7 (26%) reserved their comments.

Students were not sure whether the approach used was not good 15 (55%) remained neutral whereas 5 (18%) admitted and 7 (26%) disagreed. It can be noted that pupils have a difficulty in determining whether the approach used was appropriate or not.

A 74% response rate disagreed that the school was not supportive although 7 (26%) admitted. These responses suggest that the university was supportive. Also, the same 20 (74%) disagreed that there was poor attendance in computer sessions as these sessions were attended with a lot of anxiety.

The study also sought to find out on how students experienced computer lessons, some 8 (30%) and 2 (7%) agreed and strongly agreed that they faced difficulties in learning computers 7 (26%) remained neutral and disagreed respectively and 3 (11%) strongly disagreed. A mixed response was obtained in view of this implying that some faced difficulties whilst some were comfortable with computer lessons.

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RESPONSE	A		SA		N		D		SD	
	f	%	f	%	F	%	F	%	f	%
I find it very difficult to learn computers			2	67			1	33		
I find it difficult to ensure all learners participate	1	33			2	67				
There is lack of adequate resources			3	100						
There is inadequate time for computer lessons			3	100						
There is low internet bandwidth or speed			3	100						
I find parents or guardians not supportive	1	33			2	67				
There is a limited internet connectivity			3	100						

Table 2: Lecturer Challenges Response Statistics

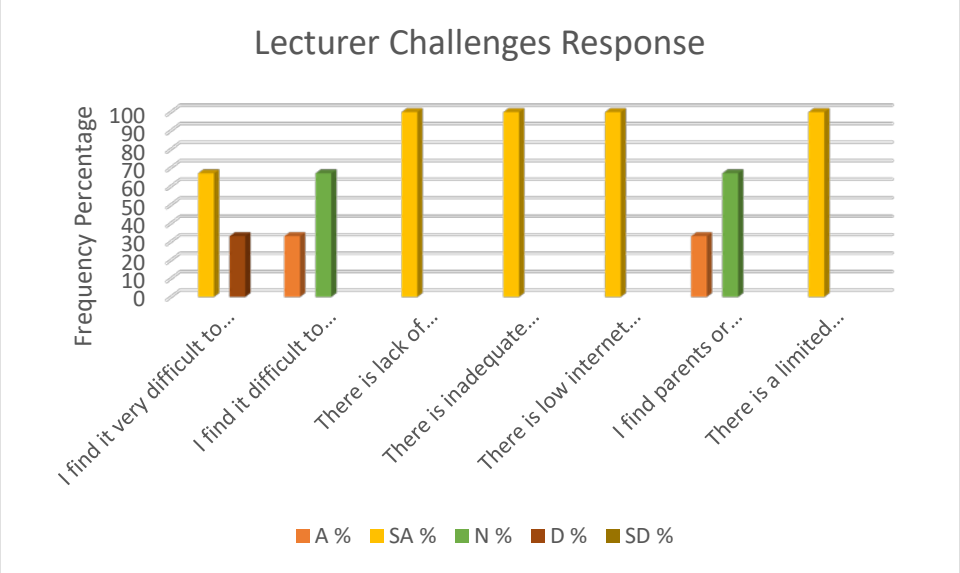

Figure 2: Lecturer Challenges Response

In view of the challenges faced 2 (67%) indicated that it is very difficult to learn computers whereas 1 (33%) disagreed. In terms of engaging learners 1 (33%) revealed that it may be difficult to ensure all learners participate and 2 (67%) remained neutral. A 100% response rate claimed that there was a lack of adequate resources, time and low internet bandwidth. Another respondent indicated that computer sessions lacked parental support but 2 (67%) reserved their comments. The responses obtained suggest that there are not adequate computer facilities at the school and this is affecting teaching and learning of computers. Most rural Zimbabwe primary schools do not have these facilities although some benefitted from the presidential computerisation scheme and donations from well-wishers.

Qualitative responses indicate that the problems within academic environment raises forth concerns such as poorly trained academic and technical staff , limited access to computer facilities by students, high students recruitment which raises the student – computer ratio, poor learning styles of the students, university culture, and teaching methods and within the natural environment there are issues to do poor supply of electricity, maybe a threat to hardware and data, computer viruses, unaffordable cost of internet connection, and the socio-economic background of students.

The analysis of lecturers' submissions raises a variety of resource related problems which include having enough hardware and software resources to offer the subject, sufficient funding to buy resources for a new subject, and software resources correctly installed, configured and maintained to run correctly on the platform that the school operates.

Qualitative responses obtained indicate that lecturers lacked sufficient continuous training on IT as the field is dynamic and ever changing hence need for regular refresher courses, there were insufficient computers at the university, underfunding was also experienced, and students lacked practice at home. The university has a high student computer ratio. Some students abuse computers. Administrative problems such as time-tabling are also faced and lecturers lacked enough time to coach students.

The findings above indicate that teaching of computers at great Zimbabwe University was affected by a number of factors. These can be categorised as teacher related, student related, and school related challenges.

ADDRESSING CHALLENGES

Respondents raised a number of ways that can be taken to address these challenges. These include mobilising funds to procure computers, public private partnerships, continuous training of lectures, encouraging parents to buy laptops for their children and increasing bandwidth of Wi-Fi within the campus.

CONCLUSIONS

There are challenges faced in computer teaching and learning in higher education. The problems can teacher, student or school related. Lecturer related challenges include subject knowledge, lack of time, approaches to teaching, dry

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(difficult to teach) topics, assessment and lack of support. Students related challenges include failure to cope with highly technical demands of computing, students and problem solving, students' resilience, lack of engagement, poor mathematical skills among students and lack of practice among students. Challenges relating to resources include technical problems insufficient resources and quality of computers used.

RECOMMENDATIONS

Based on the result and findings of the research study, the following recommendations are hereby made: (1) Government should provide funds to universities for computer procurement, (2) Lecturers should be offered continuous administrative and technical support through in-service training programme as IT is an ever diverse and changing field so they are up to date, (3) Communities should be educated on the importance of computer education with the hope of challenging them towards a paradigm shift and (4) Authorities should motivate both the school and the local communities into accepting computers as a valuable piece of technology.

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