

The Role of IT Professional Certifications in IT Instructors' Teaching Quality

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ABSTRACT

This study investigates the role of information technology (IT) professional certifications in IT instructors' teaching quality in higher education institutions (HEIs) in Tanzania. The study was conducted at the Institute of Accountancy Arusha (IAA) involving IT academic staff with at least one IT professional certification. The study used a case study research design whereby mixed methods for data collection and analysis were employed. A questionnaire was used as the main data collection method supplemented by an interview. Quantitative data were analysed using descriptive statistics. Qualitative data were analysed using qualitative content analysis. The results of the study suggest that IT professional certifications play an important role in IT instructors' quality of teaching and the certifications improved teaching quality, raised self-confidence, kept professional skills updated, improved preparation of lesson plans and instructional materials, enhanced delivery techniques, and improved setting of competency-based learning activities. The results also suggest that the availability of certified IT instructors could have an impact on improved student performance in courses.

Keywords: *Certifications; certifications in education; IT certifications; IT professional certifications; teaching quality*

INTRODUCTION

The certification of professionals at the workplace is a best practice within organizations. Professional certification is meant for making individuals productive and successful in performing specific job tasks (Hitchcock, 2007). These certifications are available in almost every field, such as education, accountancy, medicine, information technology, finance, aviation, engineering, law, among others. They are offered by professional bodies, organisations, and certificate agencies (Kabia, 2012).

Teacher quality has for some time been emphasized as part of world education reform (Akiba, 2013). Besides the regular academic diploma and degree certificates for professional teachers, there has also been a demand for teachers to acquire professional certification in teaching, to better facilitate student learning. For example, in 2006, the Indonesian government introduced an in-service teachers' certification programme to improve the quality of teachers and the education system (Kusumawardhani, 2017).

IT professional certifications are considered important indicators of commitment and professionalism by some IT professional certification providers, employers and IT experts (Hunsinger & Smith, 2009). IT certification providers offer several professional certifications from technical level to managerial level (CompTIA, 2020). These certifications are aimed at furthering individual skills in performing tasks in the current job or helping individuals to obtain new employment (Hunsinger & Smith, 2009). The certifications are available for technicians, system administrators, system engineers, database administrators, network engineers, programmers, information technology auditors, and security analysts. Instructors in the field of IT teach technical courses that produce individuals who work in different areas of this field.

This study aimed at investigating the role of IT professional certifications in IT instructors' teaching quality in HEIs, in Tanzania. The study examined the current status of the IT academic staff with IT professional certifications, and the role these certifications play in improving the quality of teaching.

LITERATURE REVIEW

An Overview of Some IT Professional Certifications

IT Professional Certifications are categorised as either vendor-neutral certifications or vendor-specific certifications (Kabia, 2012). A vendor-neutral IT professional certification is offered by an unaffiliated certification provider to an individual who has passed an examination for the certification. CompTIA, The International Computer Driving License (ICDL), and Information Systems Audit and Control Association (ISACA) are examples of the vendor-neutral IT professional certification providers. On the other hand, a vendor-specific IT professional certification is offered by a vendor to an individual who has passed an examination on vendor-specific hardware, software, or an operating system for the certification (Hitchcock, 2007). Examples of vendor-specific IT professional certification providers are Microsoft, Cisco Systems, and Oracle Corporation. Some of these certifications require recertifications after a particular period while others do not have an expiration date.

ICDL is an IT professional certification that aims at ensuring that individuals have basic competency with computers and common applications (Gunderloy & Harkins, 2004). ICDL certifies individuals' skills to operate computers in the areas of computer essentials, online essentials, documents, presentations, spreadsheets, online collaboration, and cyber security (CiA Training Ltd, 2016; Lubbe, 2014). An individual is required to pass several examinations in order to become an ICDL holder.

Microsoft Certified Solutions Expert (MCSE) is one of the several certifications offered by Microsoft to IT professionals for the validation of ability to work with Microsoft applications and technologies (Blokdyk, 2020; Microsoft, 2020). This certification ensures that on-the-job IT professionals have knowledge, abilities and skills necessary to efficiently work with new Microsoft technologies. The certification is specifically recommended for IT professionals that design, implement, and administer Microsoft business solutions in an organisation (Northrup & Thomas, 2004). An IT professional has to pass several certification examinations in order to become a MCSE professional holder.

Cisco Systems offers a popular certification, Cisco Certified Network Associate (CCNA), to validate IT professional skills and knowledge in the area of computer networking (Cisco, 2020). CCNA tests the individual's skills in computer network fundamentals, computer network access, IP connectivity and services, and automation and programmability (Buhagiar, 2020; Lammle, 2007). An individual has to pass a CCNA examination in order to earn this certification.

Certified Information Systems Auditor (CISA) is certification offered by ISACA to IT professionals as proof of technical skills for auditing, controlling, monitoring and assessing organisation's information systems (Gregory, 2020; ISACA, 2020). To earn a CISA certification, an individual has to pass rigorous examination and must have professional experience of at least five years. CISA examination tests the individual's skills in the audit process of information systems; managing IT governance; acquisition, development and implementation of information systems; operations and business resilience of information systems; and protection of information assets (Cannon, 2011; ISACA, 2020).

One of the Oracle Corporation's certifications is Oracle Certified Associate (OCA) for Oracle Database 12c for validating database expert's knowledge and skills for daily operations and maintenance (Oracle Corporation, 2020; Ramklass, 2014). The examination for this certification

tests database administrator's SQL and administration skills and capabilities by using real-world, scenario-based questions for managing Oracle database systems (Oracle Corporation, 2020; Thomas, 2014). To become an OCA for Oracle Database 12c certified, the candidate must pass Structured Query Language (SQL), and Oracle Database 12c administration examinations for the certification.

The Need for IT Professional Certifications

According to Hunsinger and Smith (2009), some managers make employment decisions to hire an IT professional based on IT professional certifications, job experience or a combination of two criteria. This study iterated that hiring managers rely on certifications to verify that IT individuals would perform their jobs better if they are certified. IT professional certifications have considerable effect on employment decisions in IT jobs (Baker, Al-Gahtani, & Hubona, 2007). The dynamic nature of the IT field imposes challenges on IT professionals at workplaces to solve complicated problems to meet organizational goals and attain sustainability (Boynton, Zmud, & Jacobs, 2008). This working environment becomes demanding for the individuals in the field as technology is constantly evolving. In addition, the IT professionals have to adapt themselves to these new innovations and technological changes to ensure that they are not left behind (Boynton, Zmud, & Jacobs, 2008).

A study by LeJeune (2006) suggested that for IT professionals to remain competitive and valuable to organisations, they must maintain positive attitudes, earn certifications, and improve their job performance. The demand for certification by employees in the workplace indicates that IT professionals still have the positive mental attitude for the job that eventually improves their job performance. Kabia (2012) reported that IT professionals with Microsoft Certified Professional (MCP) certification had higher self-reported job knowledge, abilities, and skills in comparison with IT professionals without the MCP certification. This study further claimed that MCP certification and years of experience of an IT professional could be used to predict their self-reported job competency at the workplace.

Professional Certifications in Teaching

Chang et al. (2014) argued that one of the reasons for the introduction of professional certification for teachers in Indonesia was students' poor performance in international examinations. The Indonesian government planned to solve the problem of students' poor performance by improving the quality of teaching and requiring teacher certification. The motive for certification was aimed at improving quality of teaching that would eventually improve students' performance. However, some studies claimed that this teacher certification programme had no impact on students' performance (Chang et al., 2014; Fahmi, Maulana, & Yusuf, 2011). However, according to Andersson, Johansson, and Waldenström (2011), certification of teachers had a substantial impact on students' achievement as measured by grade point average (GPA). Students who were taught by certified teachers obtained higher GPAs compared to those taught by non-certified teachers. It was further argued that students' GPAs decreased as the number of non-certified teachers increased in the composition of teaching staff. This study also suggested that certified teachers were able to use more effective instructional and assessment practices in their teaching.

A study conducted by Petty, Good, and Handler (2016) claimed that more than 80% of the certified teachers reported that teaching certification had an impact on student learning in their classrooms. The teachers in this study further iterated that the certification had affected their ways of teaching, of assessing students, and students' academic achievement. The results of this study also indicated that certified teachers were able to utilise more effective teaching methods and improved assessment techniques to enhance the learning process of students.

Research Gap

There are several studies that have been conducted on professional certifications. The effects of the certification of professional teachers and IT professionals working in the IT field have also been researched. However, there are limited studies concerning the role of IT professional certifications in IT instructors' teaching quality. This research study attempts to fill this gap by studying the role of IT professional certifications in IT instructors' teaching quality in HEIs, in Tanzania.

METHODOLOGY

This study was conducted at IAA using a case study research design. The reason for choosing a case study was because it provided an opportunity for a thorough and in-depth investigation of the role of IT professional certifications in IT instructors' quality of teaching (Creswell & Plano Clark, 2018). Furthermore, a case study helped the researcher to obtain detailed data from a small sample size, which is less applicable to other research designs (Yin, 2014). The targeted population was IT instructors with at least one IT professional certification teaching in computer science and IT programmes in the IAA's Department of Informatics. The study used a target population as the sample because the number of IT instructors in the department was very small, in keeping with earlier work (Kothari, 2004; Martínez-Mesa, González-Chica, Duquia, Bonamigo, & Bastos, 2016). In addition, given the importance of this study and the easy accessibility of respondents, the researcher set the margin of error (e) as zero (0). Therefore, using the formula by Yamane (1973) as seen in Equation (1), all 21 participants from the target population were involved in the study.

$$n = \frac{N}{1+N(e^2)} \quad (1)$$

Data Collection

The researcher used both quantitative and qualitative methods to collect data from participants and adopted an explanatory sequential design (Creswell & Plano Clark, 2018). An online questionnaire, designed using Google Forms, was used as the main method of data collection, supplemented by an interview. The researcher chose a questionnaire because it allowed quick and easy data collection, and analysis of the data. The questionnaire was mailed to all 21 respondents. Moreover, the researcher posted a link to the questionnaire in the WhatsApp group for academic staff in the Department of Informatics, to ensure that all respondents were conveniently reached. 20 participants filled in and submitted the questionnaire, for a response rate of 95.2%. The high response rate may be explained by the use of an online questionnaire that was mobile-friendly and easy for participants to fill in at their own convenience.

The researcher also carried out in-depth structured interviews to obtain additional data that could not be captured from the participants via a questionnaire (Creswell & Plano Clark, 2018; Gray, 2004). The researcher prepared predetermined questions and set standardised techniques for recording responses from the interviewees (Kothari, 2004). Out of 21 potential respondents, 10 respondents were purposively selected because they held more than one certification. Interviewing a respondent with more than one certification was preferred because it offered a diverse experience drawn from the different certifications.

Data Analysis

This study employed separate data analysis for the quantitative data using a descriptive statistics method, and the qualitative data using the qualitative content analysis method (Creswell & Plano Clark, 2018). The researcher chose descriptive statistics for the quantitative analysis because they

allow presentation of quantitative descriptions in a graphical form (Marczyk, DeMatteo, & Festinger, 2005). Frequency distribution tables were used to summarize the obtained data for easy analysis and interpretation (Gray, 2004; Marczyk, DeMatteo, & Festinger, 2005). The qualitative data obtained from the interviews were rigorously analysed using qualitative content analysis. This method of data analysis describes and interprets meaning from the content of qualitative data in a systematic way (Schreier, 2012). The interview responses were summarised into main themes, and then integrated with the quantitative data for the presentation of findings.

Ethical Issues

The researcher ensured that ethical issues such as consent, anonymity and confidentiality were taken into consideration during and after the process of data collection. Moreover, the researcher who is a faculty member without any leadership role in the department, excluded himself from participation to try to ensure that the findings of this study were unbiased. Additionally, permission for conducting this research study was obtained from the institute's department of research and publication.

FINDINGS AND DISCUSSION

This study investigated the role of IT professional certifications in IT instructors' quality of teaching. The findings of the study are organised in two parts, namely quantitative and qualitative findings. The quantitative findings are tabulated to try to ensure wide readability and understanding and is followed by the qualitative findings.

Demographic Characteristics of Respondents

The 20 respondents in this research study were IT instructors (lecturers) from the IAA's Department of Informatics with at least one IT professional certification. 85.0% of the respondents were males and 15.0% were females. Most of the respondents were aged between 39 and 44 (45.0%), while 25.0% fell into the age grouping of 33 to 38. The age groupings between 27 to 32, and 45 to 50 accounted for 15.0% of the respondents, respectively. No respondent was above 50 years old. Table 1 below summarizes the characteristics of the respondents to the questionnaire.

Table 1: Characteristics of Respondents

Gender		
	Frequency (Fr)	Percentage (%)
Male	17	85.0
Female	3	15.0
Total	20	100
Age Groups		
	Fr	%
27 – 32	3	15.0
33 – 38	5	25.0
39 - 44	9	45.0
45 - 50	3	15.0
Total	20	100

Respondents' Areas of Specialization

Respondents selected the areas of their specializations in the IT field from related areas grouped together as follows: *computer applications and operating systems*; *computer programming, databases, and web development*; and *systems analysis and design* each accounting for 22.7% of respondents respectively; *computer networks and security* (18.2% of respondents) while *artificial intelligence* accounted for 9.1% of the respondents. Table 2 below shows questionnaire respondents' areas of specialization in IT.

Table 2: Respondents' Areas of Specialization

Area of Specialization	Fr	%
Computer Applications and Operating Systems	10	22.7
Computer Networks and Security	8	18.2
Computer Programming, Databases, and Web Development	10	22.7
Systems Analysis and Design	10	22.7
Artificial Intelligence	4	9.1
Other areas	2	4.5
Total	44	100.0

Respondents' Status of IT Professional Certifications

This study revealed that some respondents were certified in more than one area of the IT field. Most of the respondents were ICDL certified as ICDL certification contributed 48.0% of all IT professional certifications. 16.0% was shared by other unspecified certifications. CCNA made up 12.0% while CISA and Microsoft Certified IT Professional (MCITP) shared 8.0% each. MCSE and OCA for Oracle Database 12c shared 4.0% each. None of the respondents held an Oracle Certified Associate Java Programmer (OCAJP) certification. Table 3 indicates the distribution of IT professional certifications among the questionnaire respondents.

Table 3: IT Professional Certifications among Respondents

Name of IT Professional Certification	Fr	%
Microsoft Certified IT Professional (MCITP)	2	8.0
International Computer Driving Licence (ICDL)	12	48.0
Microsoft Certified Solutions Expert (MCSE)	1	4.0
Cisco Certified Network Associate (CCNA)	3	12.0
Certified Information Systems Auditor (CISA)	2	8.0
Oracle Certified Associate (OCA) for Oracle Database 12c	1	4.0
Oracle Certified Associate Java Programmer (OCAJP)	0	0.0
Other certifications	4	16.0
Total	25	100.0

The Role of IT Professional Certifications in Teaching

The role of IT professional certifications was investigated to determine the extent to which these certifications are important in teaching IT and other related courses. Seven questions were asked that required participants to select their answers to the questions on a 5-point Likert scale, ranging from "Strongly Agree" to "Strongly Disagree".

The respondents were asked if IT professional certifications improved their teaching quality. The majority of the respondents, 95.0%, agreed or strongly agreed that IT professional certifications improved their teaching quality. On the other hand, 5.0% of the respondents disagreed with this item.

All of the respondents indicated that IT professional certifications help to keep their professional skills updated and agreed that the certifications raised their self-confidence.

The majority of respondents (95.0%) agreed or strongly agreed that the certifications helped with improvement of preparation of lesson plans and instructional materials while, 5.0% of the respondents remained neutral.

The respondents were also asked to indicate their view on whether IT professional certifications enhanced delivery techniques. The results indicated that most of the respondents (90.0%) agreed or strongly agreed that IT professional certifications enhanced their delivery techniques. In addition, 95.0% reported that IT professional certifications improved their abilities to set competency-based course activities for the assessment of the students.

This study also observed that 70.0% of the respondents agreed or strongly agreed that being certified as an IT instructor led to improved students' performance in their courses. The data on the role of IT professional certifications in teaching are shown in Table 4 below.

Table 4: Role of IT Professional Certifications in Teaching

	SA		A		N		D		SD	
	Fr	%	Fr	%	Fr	%	Fr	%	Fr	%
Improves my teaching quality	17	85.0	2	10.0	0	0.0	1	5.0	0	0.0
Keeps my professional skills updated	14	70.0	6	30.0	0	0.0	0	0.0	0	0.0
Rises self-confidence	18	90.0	2	10.0	0	0.0	0	0.0	0	0.0
Improves preparation of lesson plans and instructional materials	14	70.0	5	25.0	1	5.0	0	0.0	0	0.0
Enhances delivery techniques	13	65.0	5	25.0	1	5.0	1	5.0	0	0.0
Improves setting of competence-based course activities for the assessment of the students	13	65.0	6	30.0	0	0.0	1	5.0	0	0.0
IT certified instructor improves students' performance	10	50.0	4	20.0	5	25.0	1	5.0	0	0.0

This study was supplemented with a structured interview that involved 10 participants. All participants in the interview also accepted the view that IT professional certifications helped to improve their quality of teaching. They reported that the IT professional certifications improved their

proficiency, performance and quality of the service provided to their students.

The interview participants were also of the view that IT professional certifications kept their professional skills updated. They reasoned that the certifications tested their skills and abilities in using current technologies. The participants also reported that recertification kept their IT skills up to date where their certifications had an expiration date.

All interview participants reported that their IT professional certifications raised self-confidence in their areas of specialization in the IT field. Interestingly, most interviewees likened the certifications in the IT field to those available in other fields, such as Certified Public Accountant (CPA) in accountancy, stating that they provided added advantage for the holders.

Further, all interviewees reasoned that IT professional certifications were a road map which helped them to improve the preparation of lesson plans and instructional materials for the courses they teach in their areas of specialization. As participant 7 commented:

“The skills and abilities acquired through certifications have helped me to improve preparation of course plan documents, teaching and learning materials for my courses. I sometimes use certification guidelines to enrich my course contents ...” (Participant 7).

Moreover, the participants were also of the view that that IT professional certifications improved their delivery techniques. They reported that the certifications helped them to devise better classroom delivery techniques and improved supervision of computer laboratory sessions.

Also, all participants accepted that the certifications improved their abilities for setting competency-based course activities and for assessment of students. As participant 3 explained:

“When you talk of competence-based activities for students, you are talking of bringing what is going on at workplace in terms of individual's duties to the classroom, IT professional certifications do that ..., so I use more or less the same activities for my classes.” (Participant 3).

When asked if certified IT instructors help to improve students' performance, most of the participants shared the view that certified IT instructors improved students' performance. They further reported that these certifications added professional qualifications and skills to their IT field that could be used to improve their students' performance. The remaining minority added that students' performance is determined by many other factors. As participant 9 reported:

“What I can say is that IT professional certifications equip IT instructors with new skills and hands-on experience. If you utilise the skills effectively, you will likely improve your students' academic performance ...” (Participant 9).

Generally, the findings of this study suggest that IT professional certifications play an important role in teaching IT courses. The results propose the idea that certifications improve IT instructors' quality of teaching. The results imply that certified instructors have improved teaching quality that eventually enhances their performance and effectiveness in teaching. The results are consistent with the study conducted by Kennedy (2008) that suggests that the quality of teaching is attributed to performance and effectiveness of the teacher.

The results indicate that IT professional certifications help instructors to keep their professional skills updated. Earning a certification or recertification requires an individual to pass an examination that validates their skills in a current or new technology. These findings are supported by Blokdyk (2020) as the author states that certification tests an individual's knowledge, abilities, and skills to work effectively with new software or hardware.

Further, the results support the view that IT professional certifications improve IT instructors' self-

confidence in teaching. Instructors' self-confidence is very important in teaching as it affects teaching strategies and the learning process. These results are in line with a previous study which suggests that there is a relationship between the feelings of self-confidence and teaching skills (Sadler, 2013).

The results of the study also indicate that IT professional certifications improve IT instructors' abilities to prepare lesson plans and instructional materials for the courses in those areas for which they are certified. The results suggest that certified IT professionals in the teaching field are able to prepare well-organised lesson plans and instructional materials for effective teaching and learning. In support of the importance of having the lesson plans and other materials for improved teaching, Tety (2016) noted that instructional materials are an important factor when assessing the performance of teachers.

The findings of the study also demonstrate that IT professional certifications enhance IT instructors' delivery techniques. These results imply that certified professionals in the field of teaching field may devise new delivery techniques for lesson development and practical sessions after earning the certifications in their areas of specialization. These findings concur with previous studies that suggest that certified IT instructors are capable of using more effective delivery techniques that are essential for students' academic performance (Lubua, 2019; Okwubuda & Okigbo, 2018; Petty, Good, & Handler, 2016).

Moreover, the results also suggest that IT professional certifications improve IT instructors' abilities to set competency-based course activities for the assessment of the students. These findings imply that certified IT instructors are able to prepare complex and challenging competency-based activities. This is essential for implementation of a competency-based curriculum in any area of teaching and supports the understanding that students obtain the required competences by learning through activities (Komba & Mwandanji, 2015; Mohamed & Karuku, 2017).

The findings of this study also suggest that certified IT instructors could lead to improvements in students' performance as they are equipped with more knowledge, abilities, and skills which they could use more effectively to improve students' academic performance. Several studies suggest that there is a relationship between the certifications of instructors and improved students' performance (Andersson, Johansson, & Waldenström, 2011; Chang et al., 2014; Fahmi, Maulana, & Yusuf, 2011).

Limitations of the Study

While the findings of this study provide appropriate details of the role IT professional certifications in IT instructors' teaching quality in HEIs in Tanzania and in other areas with a similar context, the findings of this study are based on one institution using a very small sample and the results may not be generalizable to a wider population. Future research is recommended to include multiple HEIs in Tanzania, or more widely in other parts of Africa.

CONCLUSION AND RECOMMENDATIONS

This study focused on investigating the role of IT professional certifications in IT instructors' teaching quality, while reporting on the responses of 20 certified IT professional academic staff at IAA, in Tanzania. The results suggest that professional certification in the area have a positive impact on IT instructors' teaching quality. Further, IT professional certifications have the potential to improve teaching quality, raise self-confidence, keep professional skills updated, and improve the preparation of lesson plans and instructional materials. The study also demonstrates that the certifications can enhance delivery techniques and improve the setting of competency-based learning activities. The findings also suggest that having certified IT instructors in the classroom could lead to improvements in the performance of students, although performance of students was

not considered as a variable in this study. It is recommended that additional research be conducted on the impact of instructor certification and teaching quality on student performance in HEIs. Future research could also be conducted on other certifications in other fields of education which are under-researched in Tanzania or elsewhere.

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