



Leadership role and professional development of technology

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Abstract

The Covid-19 pandemic has indeed driven educational technology to the next higher level, especially in faculty teaching and research. There is an increasing need for faculty to embrace new technology, especially with the emergence of new normal in both teaching, learning, and research. To become conversant with the technologies, educators need opportunities for professional development. And to continue to be involved with new and evolving technologies in education, faculty members seek leadership and support. This study was carried out to investigate the leadership role in the professional development of technology in the educational delivery system of Nigerian universities. The study adopted a qualitative approach. This qualitative study randomly selected a convenience sample of 100 faculty and administrators in the faculty of education of 12 universities in Nigeria. Using focus-group discussion sessions, interviews, the researchers met with 100 participants in groups of 3 to 15 each session. Data were transcribed and entered into a database for analysis. The leadership role of faculty members, technology specialists, policy, support, and infrastructure were discussed. The study shows that to help faculty members lead the way in investigating, integrating, and evaluating technologies, faculty members need policies and leadership support, equitable access to technology, support, professional development, and recognition.

Keywords Professional development · Leadership · Technology · Faculty · Educator

1 Introduction

To make the transition to using technologies in their teaching and in their research, educators need a vision and opportunities to participate in professional development. Educators also need the support of the administration to make the transition

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to using technology. Educators look to chief academic officers and administrators for a shared vision of technology in education, and leadership that demonstrates their commitment (Chai et al., 2017; Howard et al., 2019; Leithwood et al., 2020).

Powell, & Bodur's study reveals a need for administrators to investigate training and professional development addressing such issues as the needs of educators and the need for training, faculty release time for development and delivery of courses, barriers and incentives for the instructor, and factors that encourage teamwork among instructors and administration, effective teacher and evaluation processes, teacher competencies, training on adult education theory, survival in the change process, and reasons for successful online programs (Powell & Bodur, 2019). Administrators also need competencies including general awareness of trends in the industry and emerging technologies; the selection, implementation, support, and evaluation of the technologies; and the analysis of cost benefits (Marquardt & Kearsley, 1999; Emre, 2019; Shantanu, 2020). Administrators, researchers, and support service managers identify copyright and intellectual property rights, support for learner and professional development for distance educators, quality assurance, and convergence of traditional and distance education as emerging issues affecting distance education (Andersen et al., 2018; Mohr & Shelton, 2017; Owusu-Ansah et al., 2021).

1.1 Faculty learning technologies

Faculty learns best in a learning environment based on adult education principles (Darling-Hammond et al., 2017). From experience working with faculty, Cellante supports adult education principles of faculty being involved in the planning process working from clearly defined goals on technology that will be of value in their work (Cellante, 2002). When distance educators were asked how they learned more about technologies, instructional design, and andragogy and pedagogy without attending formal courses, they said that they learned from other people and they learned by doing (Armstrong, 1998). From years of experience in online learning, Adna suggests training strategies should include workshops or mentors (Adnan, 2018). Adna suggests cognitive apprenticeship within a constructivist view to initiate the novice into a community of expert practice. An important part of professional development is to gather expertise electronically from lectures, debates, research, and resources. In recommendations for teachers' professional development, Gjedia & Gardinier offered practical solutions such as mentoring, collaboration, communication through ministries of education and teachers' websites, online courses, and partnerships with businesses, in-house mentorship with student teachers, and responsibility for own learning (Gjedia & Gardinier, 2018). For professional development to be consistent with constructivist principles, Balmer et al. suggest mentoring, peer coaching, reflective seminars, and collaborative work teams (Balmer et al., 2018). Nair & Munusami suggest professional development knowledge can be gained from benchmarking, conferences, consultants, reading, viewing, listening, monitoring trends, collecting data,

collaborating, alliances and joint ventures, and new hires (Nair & Munusami, 2019). Knowledge can also be created from problem-solving, experimenting, and demonstrations. Once gained, knowledge can be shared by others by a list of capabilities per employee, by documented lessons learned, news, policies, products, and processes. Organizations can transfer knowledge through written communications, training, briefings, internal publications, tours, job rotations, and mentoring. From a survey of recipients of teacher enhancement grants, MacPhail et al. report that the major common thread is not areas of expertise, but interest in teacher change, assessment, education reform, and professional development (MacPhail et al., 2019). To further professional development, the same group indicates that an electronic site or user group would serve as a good tool to seek information, solutions, findings, successes, and failures (MacPhail et al., 2019). MacPhail et al. report that of all the topics posted in the study, the discussion about the need for contact after workshops was most successful (MacPhail et al., 2019). Both the posting and just listening participants found the electronic user group to be a useful communication and professional development tool. Pedretti & Woodrow describe how teachers adopt technology through collaboration, day-to-day interactions, feedback from students and other teachers, and how teachers are nourished by administrators, parents, and co-researchers (Pedretti & Woodrow, 1999). Teachers gain valuable information from professional development loops to guide their thinking and inform their decision-making. Teachers who act as agents for integrating technology may serve as “powerful vehicles for professional development” themselves (Pedretti & Woodrow, 1999; p. 141). As noted, professional development for teachers is eclectic (Özer et al., 2021; Ertmer & Ottenbreit-Leftwich, 2010; Zhao & Rop, 2001), therefore a variety of professional development activities need to be made available.

1.2 Educators

Within an e-learning environment, Muhammad & Ariatmanto’s comparison between goals held by educators for their students’ learning and goals held by educators for their own learning is illuminating (Muhammad & Ariatmanto, 2021). Muhammad & Ariatmanto reassures us that educators hold shared values to “embolden students to take responsibility for their own learning by instilling interest and avenues to pursue that interest... and to ensure their skills for knowledge-building and independence” (Muhammad & Ariatmanto, 2021). However, Naveed et al., question if educators apply these same goals to their own learning and if they, as professional educators, are advancing the “efficacy of their own teaching methodology.” Naveed et al., also ask educators to ponder the following questions:

Am I an educator taking responsibility for my own learning? Can I advance my knowledge and abilities to empower students to take responsibility for their own learning? How can technology help advance these priorities and implement these strategies? (Naveed et al., 2020)

Trakru & Jha suggests educators need to assume responsibility for their own professional development to integrate technology into their work; and faculties of education, school boards, and schools need to collaborate to generate innovative learning opportunities (Trakru & Jha, 2019). New teachers and seasoned teachers need to be prepared in the twenty-first century to help learners learn problem-solving, collaborate and communicate and make a paradigm shift to principles of constructivism. Educators are asked to implement andragogy and constructivism in their own professional development.

2 Methodology

A qualitative research method was selected for this study. This qualitative study randomly selected a convenience sample of 100 faculty and administrators in the faculty of education of 12 universities in Nigeria. Using focus-group discussion sessions, and interviews, the researcher met with 100 participants in groups of 3 to 15 each session. Data were transcribed and entered into a database for analysis. Qualitative content analysis involves a systemic coding of the data to identify themes or patterns. We began the analysis during the transcription of the interviews. We created the transcripts within NVivo software, which allowed us to synchronize them with the audio files. After the analysis, the findings were developed and recorded.

3 Findings/Discussions

The study investigated the participants' perceived leadership role in professional development with regard to technology. Each faculty member participant (participant) in the study was assigned a database number to maintain the confidentiality of names. When the findings reference a participant or participant's comments, the database number is recorded in parentheses. Participants are busy in their field and rely on technology specialists to lead the way and keep them updated on what is new and what is relevant. They also look for leadership from the department, faculty, and university. They expect support from policies and procedures, and they look for a strong infrastructure to support them.

3.1 Demographics

100 invitees participated from 12 universities. There were 58 (58.00%) males and 42 (42.00%) females with ages ranging from 20 and above years. The majority of the participants 51(51.00%) are in the age range 50 – above. There were 11 (11.00%) Bachelor's degree holders, 31 (31.00%) Master's degree holders, and 58 (58.00%) Ph.D. degree holders. There were 21 (21.00%) administrators, and 79 (79.00%) faculty in the study. Participants had working experience of <5 yrs. 3 (3.00%), between 5 and 3 years 9 (9.00%), 3–20 years, 27 (27.00%), and 21 years and above 54 (54.00%) as shown in Table 1 below.

Table 1 Demographics

| Variables | Female frequency (%) | Male Frequency (%) | Total Frequency (%) |
|---------------------------|----------------------|--------------------|---------------------|
| Gender | 42 (42.00) | 58 (58.00) | 100 (100.00) |
| Age (Years) | | | |
| 20–29 | 6 (75.00) | 2 (25.00) | 8 (8.00) |
| 30–39 | 8 (57.14) | 6 (42.86) | 14 (14.00) |
| 40–49 | 17 (62.96) | 3 (37.04) | 27 (27.00) |
| 50-above | 11 (21.57) | 40 (78.43) | 51 (51.00) |
| Educational Qualification | | | |
| Bachelor | 8 (72.72) | 3 (27.28) | 11 (11.00) |
| Master | 19 (61.29) | 12 (38.71) | 31 (31.00) |
| Ph.D. | 15 (25.86) | 43 (74.14) | 58 (58.00) |
| Designation of respondent | | | |
| Administrators | 15 (71.43) | 6 (28.57) | 21 (21.00) |
| Faculty | 27 (34.18) | 52 (65.81) | 79 (79.00) |
| Work experience (Years) | | | |
| Under 5 years | 7 (70.00) | 3 (30.00) | 3 (3.00) |
| 5–3 years | 3 (33.33) | 6 (66.66) | 9 (9.00) |
| 11–20 years | 16 (59.26) | 11 (40.74) | 27 (27.00) |
| 21 years and above | 16 (29.63) | 38 (70.37) | 54 (54.00) |

3.2 Pre-service and service teachers

As well as looking for leadership, participants indicated they provide leadership to pre-service and service teachers. Although several (12%) of the participants interviewed indicated that pre-service teachers have technology skills and that there are more important aspects of the teacher education program to focus on than technology, many participants (56%) identified technology areas they perceive to be important to the development of a teacher. Teachers need to be comfortable learning continuously from a variety of people and a variety of sources as technology evolves so quickly, and teachers need to effectively integrate technology with the curriculum. Teachers need to think of the internet and other technology resources as an expansion of their library. Both pre-service and in-service teachers need to think about multi-perspectives, think critically of technologies, critique materials, and equipment, question sources of information, consider gaps in access, and consider issues, ethics, and the impact of technology. Teachers also need to use technology to decrease their time doing administrative tasks. Participants also indicate that they have a role to play in providing a vision and strategies for using technologies in the classroom.

3.3 Faculty members in the Lead

58% of the participants suggest, as educators and researchers in education, need to take a leading role in the integration of technology on behalf of pre-service and service teachers.

To lead the way, participants need to be discussing and communicating issues with regard to technology (23), by supporting pre-service and in-service teachers who are expected to have but do not have technology skills (36), by modeling (41, 57, 65), and by working with students (73, 95).

3.4 Technology specialists

63% of the participants rely on the technology department, experts in the field, and early adopters to lead the way. Participants are interested in discussions with early adapters and specialists about issues such as the impact technology has on the field and on people. “Impact of technology on professional development and how it can reposition us in the field” (46). How technology shifts how people think” (62).

3.5 Recognition/Support

48% of the participants expect the university/faculty to take a strong lead in professional development by providing policies for release time, incentives, and rewards for learning and using technology.

The university and faculty need to take a harsh look at decisions such as turning to educate undergraduate students over to people like graduate students and to online courses, at the same time looking at how faculty could implement courses using technologies.

3.6 Policy

Participants talk about the need for leadership with regard to policy. Participants brought up the need for a policy with regard to alternative learning formats (46, 63). Participants are looking for direction on where the university is going with regard to technology and the obvious lack of financial support for the instructional technology unit (2, 80). Many participants (54%) identify the need to persuade the upper echelon to support equitable technology sabbatical. It was suggested that technology be recognized in the yearly review process (86). Participant are looking for discussions on the faculty’s policy on distance delivery (91, 4, 5, 87). Participants are concerned with policies that address funding and recognition of faculty involved with technologies and their implications for practices.

3.7 Infrastructure

An integral component of the leadership role is the infrastructure needed for the use of technology. “Technology is only as efficient as the structure that supports it” (66). Almost one-third (30%) of the participants did not volunteer a response regarding equipment, and few (2%) offered positive comments “the plan is comprehensive” (4), “I am indebted to the faculty for giving me equipment” (29), but more than two-thirds of the participants (68%) commented that they were not pleased with the present policy of acquiring technology equipment. The 68 participants stated they

were not in favor of the present system of acquiring equipment and that it is the faculty/department's responsibility to provide financial support for the purchase and maintenance of technologies in order for faculty and staff to do their jobs. "There is a lack of university support!" (80). The need for full and equitable support for the purchase and maintenance of technology by the faculty is of particular importance because 68% of the participants raised the issue in the open comments section of the interview. These were all unsolicited comments.

Participants express their concerns over the present policy that expects faculty to provide most of their office and home technology equipment/software from their own funding or from their own personal money. One participant states that the lack of technology is a deterrent to using technology (77), and many agree (3, 6, 3, 13, 17, 22, 23, 27, 34, 36, 67, 68, 79, 85, 96) that finding funding for technology is a "burden". They agree that it is "bizarre that you are expected to pay for your own equipment" (50). Participants also validate the need to have technology equipment/software provided for them because they are expected to lead the next generation of teachers by example (6) and because they are expected to show how technology can be incorporated into the curriculum (51). Participants want new technologies to test and use before they are rolled out (65), specific software for such applications as music writing or historical research (75, 83), smart classrooms and portable labs (2, 13, 20), and color printers, scanners, and digital equipment (41, 82, 92, 96). Participants request technology for use at home (1, 34, 54), on-campus (68), and when presenting off-campus.

One participant describes the need for an infrastructure to be in place for faculty to work with technologies: "Technology is only as efficient as the structure that supports it" (66). If you don't have a good hardware support structure, then technology becomes very cumbersome for many people. Support is fundamental to the well-being of the whole faculty's technology structure. They are the most important link. The structure has to work for the faculty to be efficient (66).

3.8 Time management

When asked about drawbacks or deterrents to professional development regarding technologies, almost all participants (85%) identified time as both their most important issue and their most valued resource. Twelve participants explain their overload of time with their research and teaching: "We are asked to do so much, there often isn't the energy, even if you have the will and the money" (34). Although most participants see lack of time as a barrier to their professional development, many of the participants see opportunities to reclaim time in the future.

Many participants (15%) look to leaders to legitimize equitable release time to learn and use technologies and for them to help others with technology. Participants are also looking for equitable financial support for sabbaticals, equipment, and conferences to learn about technologies.

Participants identify trial and error learning as a waste of time. Participants offer suggestions. Courses should be short and scheduled locally at multi times during the end of the term with relevant content. Instructors or people who can help with a technology need to be able to advise on both technical and course development (13).

Participants suggest a twenty-four-hour hotline of support to reduce the amount of time they spend seeking answers about the technology. Working on a project in a partnership is also an activity that they feel they would more likely make time for. Participants also want ways to hear about the technology without taking away from their workday such as communications from technology people or early adapters to technology (50).

Participants want to be sold to and marketed to, they want information about new technologies and the application of technologies to see if the technologies are relevant to the work they are involved in. Participants suggest that help, training, and courses can only be time effective if they are relevant to the work they do. “Just in time or a waste of my time” (24). “Time invested into learning has to result in payoff” (6).

3.9 Need for discussion

Under the heading of additional comments, and from other unsolicited comments noted throughout the interviews, participants identified the importance of leadership to support collaboration to discuss issues relevant to technology and the dissemination of this information to support pre-service and in-service teachers. Participants also commented that advocating for issues relative to technology and learning was also part of the leadership role.

Several faculty members (48%) are asking for more discussions within the faculty to discuss issues, ethical dimensions, and the future of technology in education. “Discussion in the faculty needs to happen” (90).

Requests for more discussions going on in the faculty are based on a problem with cocooning. Eleven participants brought up the issue of isolation. Participants are not working as much publicly at the university. Participants are working at home because they experience fewer distractions, and they are working less with students on campus because students are more independent and prefer to spend less time at the university. The email has caused a culture shift for participants that is isolating. Participants are spending more time in their offices communicating electronically with colleagues with common interests across the globe. As participants gain the opportunity to print within their offices and become less dependent on others for help using software, participants are less likely to come out of their offices. “Everybody stays in their offices, closes the door, reads millions of emails, I find it much more isolating” (35).

Participants identify areas that need to be discussed at the faculty level. Topics for discussion include the definition of technology, the impact of technology on learning, thinking, academic roles, and entrance to B.Ed. requirements, research, ethical considerations of technology, and the impact of commercialization like cell phones and globalization.

4 Summary

Faculty members recognize their need for leadership as they provide leadership to pre-service and in-service teachers. Participants feel the faculty is in a good position to investigate and recommend practices to integrate technology. Faculty members see their need to broaden discussions to include leadership for the disabled (2), alternative learning formats

(46, 63, 80), online presence (12), support of faculty (2, 3, 13, 19, 34, 72, 77, 64, 86, 99, 96), support and teaching of undergraduates (4, 90), expanded support services (30, 66, 86, 1, 37, 12, 2, 59, 28, 67, 79, 92, 67, 79, 37, 64, 39, 90, 91, 28, 71, 67, 86, 7, 13, 68), equitable access to learn and use technology (13, 25, 17, 19, 36, 48, 58, 95, 96, 34, 13), recognition of time on email (69, 84, 5, 12, 13, 22, 23, 84, 75, 50), and for the need for infrastructure hardware and software (1, 18, 6, 65, 40, 14, 57, 6, 7, 21, 96, 88, 16, 67, 6, 8, 19). As participants strive to learn and apply technologies, they are looking for leadership and policies for equitable access, training, and support based on an evolving but reliable infrastructure.

Participants are looking for colleagues, departments, faculty, and the university, for leadership and support in their quest to become conversant with the use of technology, comfortable with professional development driven by technology, and for their quest to critically evaluate the impact of technology on education.

5 Conclusion

Based on the findings of this study investigating leadership role in professional development with regard to technology, the following concluding statements emerged.

1. To help faculty members lead the way in investigating, integrating, and evaluating technologies, faculty members need policies and leadership support, equitable access to technology, support, professional development, and recognition. Faculty members need leadership as they provide leadership to pre-service and service teachers and to the field of education.
2. Faculty members look for support to initiate discussions of critical issues involving technology and education. Faculty members recognize an emerging cocoon environment where faculty can, from their office, write, print, communicate locally and worldwide, and access their electronic office files from off-campus. Faculty members also recognize their need to move from meeting globally to meeting locally with colleagues to discuss and debate the philosophy of technology in education and critical issues such as the impact of technology on learning, thinking, education, and research.

Data availability Data is available upon request.

Declarations

Conflict of interest The authors declare no conflict of interest.

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