An Exploration of College Principals' Technology Leadership Competency Assessment

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Abstract

This paper explores leadership technology competence of college principals in six domains, (1) vision and leadership, (2) teaching-learning, (3) professional practice and productivity, (4) operations and support management, (5) evaluation and assessment, and (6) legal, ethical and social issues. Competence of the principals for using technology gadgets in the domains of teaching -learning was found high whereas his/her social, legal and ethical considerations for technology use were found to be low. Most respondents valued technology competence but focused incorporating its administrative use. Furthermore, leadership training programmes may contain modules related to professional use of databases, content and data management systems in order to enhance principals' use of these for day-to-day administrative purposes.

Key Words
Technology Leadership Competence, Intellectual Property Rights, Cyber Security

Introduction

The growth in technology usage specifically relates to what it is able to offer and how it facilitates its users (Abo Jaser, 2012; Garland & Tadeja, 2013). Technology gadgets have shifted from being desired to being required and have become a necessary component of basic life requirements. However, technology explosion needs to be controlled in all spheres of life. Technology has also become a virtual part of the world of education at all levels. Live of students and teachers of current era have a deep influence of technology and it can not be denied that technological devices are being used as effective teaching-learnng tools as well. (Ali, 2013; Tamim, 2013)).

Many educators believe that educational technology is master key for the eminence of education and teaching-learning process. It means that technology changes the role of teacher from information giver to knowledge facilitator, coach and technology manager. Use of technology in schools/educational institutions simplifies adminstrative tasks and reduces record keeping time (Mills & Tincher, 2002).Competencies of principals for integrating technology is critical if the teaching-learning environment of schools is expected to be ICT laden. Many responsibilities are attached to technology leadership roles ranging from proper installation of computers to the assurance of their healthy use for educational purposes. Principals are also required to ensure equal access to technologicl gadgets by all teachers (Flanagan, & Jacobsen, 2003).

Although role of principal in technology integration at school level is inevitable, yet it is a less explored area of research. School leaders' capabilities and competency to use ICT personally also effects its implmentation at organizational level (Byrom & Bingham, 2001; Schiller, 2003). According to the reflections of Dinham (2005), leadership plays a key role in developing innovative and effective schools according to the demands of 21st century. But for this purpose , school leaders must be aware of the 21st century teaching learning demands and work accordingly. School principals' self-efficacy, competency, skills and interest may have aprofound influence over school's instructional practice and change. Consequently, effective school principals essentially may have awareness and dispositions about information-communication technology and be able to perform accordingly.

Literature Review

Integrating technology into the college classrooms is a challenging task for teachers as well as administrators. Those higher secondary institutions (colleges) are considered technology-laden

where the college administration manifests leadership technology competence. Arokiasamy and Ismail (2015) investigated current status of ICT use by Malaysian principals and concluded that leadership style of principals had a strong impact of use of technology in their respective institutions. Brunson (2015) and Yu (2015) explored technology leadership competence of elementary teachers and recommended that principals are responsible for leading the charge of many reform efforts in their institutions so management may provide them extensive training in this regard.

Technology Integration in Teaching-Learning Environment Through Leadership and Vision

College principal' role has changed from a traditional administrator to a curricular and technological leader. In addition to this it is expected of the principal to provide a vision to the teachers and support staff for technology integration in the learning ecology. Machado and Chung (2015) have also highlighted this point and suggested that as the role and effect of principal is undoubtedly strong in integrating technology at all domians of an academic setting, so awareness seminars and extensive trainings may be conducted in this regard. Samancıoğlu, Bağlıbel, Kalman and Sincar (2015) explored the correlation between technology relationship behaviour, principals' vision and teachers' level of technology integration. Their results revealed a positively strong connexion amongst the two variables.

Professional Practice, Operations and Management Through Technology

Educational leadership is constantly being challenged to prepare future teacher with technology competence. Debate continues about the professional practice of educational leaders for technology integration at institutional level (Bakir, 2016). Every educational organization deals with variant sub-clutures and ways of perceiving organizational processes such as technology adoption. For principals, efficiency and effectiveness of any organizational process is the predominant logic. These stakeholders are responsible for creating and administering necessary steps for organizational reform. Professional expertise and practice of a principal, technology embeddedness in management and its sustainable use in teaching depends upon the style and philosophy of a college principal. Bøe, Gulbrandsen and Sørebø (2015) have concluded as e-learning technology has become pervasive in higher education, it is a challenge for educational leaders to keep the teachers motivated for its sustainable use. Blau and Shamir (2017) have suggested that college principals need to upkeep faculty in using and connecting to technology systems for operations and management, such as curriculum management system and student information system. For this purpose, they may allocate additional/ supplementary funds as well.

Assessment and Evaluation of Teaching and Learning Through Technology Integration

Successful digital conversion in higher classrooms require determining assessment of learning through technology tools. Principals play a substantial role in implementing teacher evaluation and effectiveness policies that effect the overall school culture (Bøe, Gulbrandsen, and Sørebø,2015). Successful implementation of assessing teaching through technology integration depends upon the cempetence, motivation and capacity of principals. Recently, evaluating teacher competence and performance has evolved as a complex task for college principals, especially when teaching has integration of technology. Principals have to evaluate teachers' teaching responsiblities, their blend of technology into learning etc. Similalry, it becomes imperative for principals to evaluate technology based instructional practices for their effectiveness, assess existing management operations based on technology for improvement and look deeper into effectiveness of digital tools for performance of teachers (McKnight, O'Malley,Ruzic, Horsley, Franey and Bassett, 2016).

Social, Legal and Ethical Issues when Integrating Technology

Willard (2012) state that widespread adoption and availability of digital technology in teaching brings new and stimulating ethical issues to the vanguard for educational administrators.College principals are required to employ their best professional judgment when dealing with technology-related ethics. They find it helpful for teachers to recognize these types of situations and to discuss them with other educators to develop awareness of new ethical issues. Furthermore, Drahos (2016) denote that head of institutions must know details about copy right and intellectual propert rights and be able to train their teachers in this regard as well.
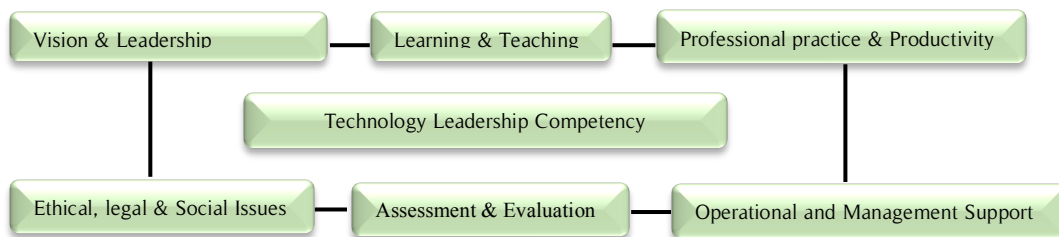
Conceptual Framework

Figure 1: Variable related to Leaders' Technology Compentency Assessment

Objectives

i.   To explore observed level of computer usage by college principals at higher secondary education level.
ii. To investigate perceived technology leadership competence of college principals at higher secondary education level.

Methodology

Descriptive survey method was used to determine the perceived level of computer use and technology leadership competence of college principals. A purposive sample of fifty college principals serving in Federal colleges were taken as sample of the study. Self-constructed questionnaire having a reliability of r=.92 was used to extract the required data. Furthermore, three experts of the field checked its face validity. This questionnaire has six subscales namely vision and leadership, teaching- learning, professional practice and productivity, operations and support management, evaluation and assessment, legal,ethical issues and social issues.

Results and Findings

Table 1. Mean Score Distribution on Computer use Sub Scale (n=50)

Scale	Percent(%)					Mean	SD
	Never use	Use few times a month	Use few times a week	Use 2 or 3 times a week	Use daily		
Internet use	0.0	17.0	15.0	43.0	25.0	3.56	0.81
Hardware/software use	0.0	23.3	30.0	40.0	6.7	3.44	0.76
Instructional use	0.0	36.7	23.4	26.6	13.3	3.05	0.69
Administrative use	0.0	10.0	35.0	15.0	30.0	3.77	0.99
Overall computer use	0.0	12.0	20.0	43.0	25.0	3.45	0.79

Table 1 shows that overall computer use of principals was moderate (m= 3.45, sd= 0.79). The levels of mainframe computer usage by principals of secondary school was apparent as internet usage m= 3.56, software/hardware use m= 3.44, instructional usage m= 3.05 and administrative usage m= 3.77. In addition to this, internet use 2-3 times week is 43 percent, hardware/software use 2-3 times a week is 40% , for instructional use the percentage is 36.7 for few times a month, whereas administrative use on daily basis accounts for 30 percent. Based on this data, further findings revealed that the percentage of principals using internet at home was higher as compared to those using it in office. Besides this, most of the principals (60%) indicated that they use internet for e-communication (sending/receiving mails). In addition to this 70 % principals pointed out that they used spread sheets and power point most commonly.

Table 2. Descriptives for Leadership and Vision Subscale (n=50)

S.No	Statement	Mean	SD
1	Participation in school's recent technology planning process.	4.15	1.12
2	Communication of information about technology planning process to school's stakeholders.	4.05	0.98
3	Promotion in contribution of school's stake holders in planning processes related to technology.	3.43	1.09

4	Comparison and alignment of one's own school's technology plan with that of other schools.	3.39	1.03
5	Insertion of enquiry based equipment practices for instituional enhancement plan.	3.02	0.92
6	Engagement in best practices in technology usage.	3.92	1.01
	Overall mean score	3.66	

Results of the sub scale of leadership and vision are reflected in Table 2. Highest mean score (m=4.15) is about the statement related to school leader's participation in most recent technology planning process whereas lowest mean score is about inclusion of research based best practices for the improvement an upgradation of school plan (m= 3.02, sd= 0.92). In addition to this mean score for participation of stake holders in the process of technology planning (m= 3.43) and alignment of one's own school technology plan with other (m= 3.39) is moderate. However, mean score for communicating to stake holders about technology plan (m-4.05) and engagement of school leaders in best practices for the use of technology (m=3.92) are moderately high. Findings promulgate that school principals have an inevitable role of technology promotion in their schools, so they need to focus more participatory role. Principals may collaborate with the stake holders of their schools, it may enrich implementation of new technology plans. Another important aspect of implementing technology successfully is to have a comparative view of what is happening in other schools.

Table 3. Descriptive Statistics for Learning and Teaching Subscale (n=50)

S.No	Statement	Mean	SD
1	Providing support to teachers for analyzing student assessment record.	3.80	0.97
2	Providing assistance to teachers to modify instruction on the basis of student assessment data.	3.40	0.95
3	Disseminating best practice model of technology integration to teachers in teaching and learning.	3.55	0.88
4	Providing support to teachers who want to share technology practices and related information.	4.05	1.05
5	Conducting need analysis for professional development of teachers in use of information and communication technology.	4.00	1.01
	Overall mean score	3.79	

Table No 3 displays the mean scores of teaching and learning subscale. Highest mean score is related to providing support by the school principal to those teachers who want to share information related to technology use and best practices of it (m=4.05, sd=1.05). Lowest mean score is manifested by provsision of assistance to teachers in modifying their insrtuction on the basis of student assessment data (m= 3.40, sd= 0.95). School principal's provision of assitance to teachers for recording and analyzing student assessment data is also towards moderate score (m=3.80). Furthermore, support for dissemination of best practice technology use model also manifests moderate mean score= 3.55. However, school pricipals' support towards conduction of need analysis for teacher professional development (m= 4.00) and facilitation for delivering such work shops (m=3.98) shows a moderately high score.

Table 4. Descriptive Statistics for Productivity and Professional Practice Subscale (n=50)

S.No	Statement	Mean	SD
1	Participation in professional development activities for improvement and expansion of use of technology in school.	3.98	.58
2	Using technology in completing day to day tasks such as developing school budget, time tabling, gathering information.	3.05	.69
3	Using technology for accessing records of students.	3.00	1.43
4	Using technology for communicating with peers, students, parents.	3.34	1.02
	Overall mean score	3.27	

Above mentioned table assesses the sub scale of productivity and professional practice. School principals show a higher mean related to participation in professional development activities (m= 3.98) but a lowest mean score is observed related to the statement that they use technology for assessing students' records (m=3.00). Similarly, principals donot use technology much to assess personal records of staff and faculty (m=3.02). Overall mean score of this subscale (m= 3.27) indicates an average score. It means that technology is used at a lower level for the professional productivity and practice by school principals.

Table 5. Descriptive Statistics for Support, Management and Operations Subscale (n=50)

S.No	Statement	Mean	SD
1	Supporting faculty and staff in using and connecting to technology systems for operations and management, such as curriculum management system and student information system.	3.14	0.99
2	Allocating school campus funds to help in meeting school's technology needs.	4.05	0.95
3	Pursuing supplementary funds to help meet technology needs of the school.	4.00	0.87
4	Ensuring upgradation of hardware and software in technology plans of the school.	3.95	1.21
5	Advocating for timely and adequate technology support service at district level.	3.00	1.10
6	Investigating the satisfaction level of staff and faculty about technology support service provided by the school.	4.25	.95
	Overall Mean Score	3.73	

Above mentioned table indicates the results about mean score on the subscale of support, management and operations. Least mean score m=3.00 is related to adequate technology support service to be provided by college principal at district level. Whereas, the statement related to investigation of satisfaction level of faculty about supporting and providing technology services to them shows highest mean score, m= 4.25. It means that college principals put effort in implementing technology efforts in their colleges but are not capable to get adequate support at district level in this regard. Similarly, pricipals need to facilitate their teachers in using technology for student information system and curriculum management system as well. This is a grey area and needs to be adrressed if we want to see upgraded utilization of technology for teaching learning process at college level.

Table 6. Descriptive Statistics for Assessment and Evaluation Subscale (n=50)

S.No	Statement	Mean	SD
1	Promoting technology based system for collecting students' assessment data.	3.02	0.92
2	Evaluating technology based instructional practices for assessing their effectiveness.	3.12	0.97
3	Evaluating existing administrative operations based on technology to assess their effectiveness.	3.30	0.89
4	Evaluating the effectiveness of specialised training programs associated to use of technology for teachers.	4.04	1.04
5	Assessing the effectiveness of technology use for performance of teachers.	3.95	0.93
	Overall Mean Score	3.48	

This table reflects the results related to subscale of assessment and evaluation. Lowest mean score is reflected on " promoting technology based systems for collection of student assessment dat", m= 3.02 and sd=0.92. It means that college principals do not use technology frequently for the above mentioned purpose. However, scores on " evaluating programs meant for teachers professional development related to technology" falls on a highest scoreof m=4.04, sd=1.04.So, we can say that technology for assessment purposes is under less use, however college principals are fully aware to keep a track of professional development programs being carried out for teachers and they take a minute notice of such activities. But as per results of this subscale, principals need to focus more on evaluation of technology based instruction and existing administrative operation using any kind of technology for their support.

Table 7. Descriptive Statistics for Social, Legal and Ethical Issues Subscale (n=50)

S.No	Statement	Mean	SD
1	Ensuring equitable use of technology across the school.	3.01	0.96
2	Communicating about ethical, social and legal issues for raising awareness about responsible use of ICT.	3.05	0.93
3	Raising awareness about security,privacy and Internet safety issues.	2.02	0.84
4	Promoting a healthy and safe technological environment.	2.95	1.02
5	Raising awareness about copyright and intellectual property rights.	2.00	1.03
	Overall Mean Score 2.60		

Table No 7 indicates the mean score of statements related to social, legal and ethical issues. Lowest meanscore is manifested about raising awareness related to intellectual property rights and copyright policy (m= 2.00), whereas highest meanscore is about communication of legal, social and ethical issues for raising awareness about responsaible usage of ICT (m= 3.05). However, overall mean score of this subscale is 2.60 which shows a lower range. It means that College principals need to focus more towards ethical, legal and social considerations in ICT use.

Table 8. Overall Mean Scores of The Six Subscales (N=50)

Subscale	Mean	Range	Status
Visison and Leadership	3.66	4.15-3.02	Medium
Teaching and Learning	3.79	3.40-4.05	Medium
Professional Practice and Productivity	3.27	3.00-3.98	Medium
Operations, Management & Support	3.73	3.00-4.25	Medium
Evaluation and Assesment	3.48	3.02-4.04	Medium
Ethical, Legal & Social Issues	2.60	2.00-3.05	Low

Table 8 gives a complete overview of the mean scores of all the six subscales related to leadership technology competency scale. In indicates that highest mean score is related to learning and teaching subscale (m= 3.79) whereas lowest mean score is related to sixth subsclae which investigates social, legal and ethical issues (m= 2.60). All the other subscales show a medium range whereas last subscale shows a lower range indicating that principals show lower awarness and less implementation of ethical, legal and social issues related to technology use.

Discusion

This paper raises some issues related to college principals' technology leadership competencies and defines the magnitude to which our college administrators are using and integrating technology for their personal and professional use. Findings indicate that college principals' use internet two to three times a week for their personal usage whereas administrative use of computer is on daily basis. However, this study designates that they must be adept in employing the computer to succour in directorial and instructional tasks.

Findings related to the subscale of leadership and vision state that school leaders/ principals are self aware about the importance of technology competence. That is the reason they try to attend the seminars and relevant work shops. However, only attending such professional development programs is not enough for school improvement. School improvement occurs when school principals attain technology competence and try to transfer it to their teachers and staff (Tondeur et al ,2015). If h/she has technological competence, only then can the school climate indicate it in teaching learning (Albion et al, 2015). Findings of the teaching and learning subscale are in consistant with the work of Meneses & Mominó (2015) and Suyata(2017). It was refelected in these studies also that school principals have a less focus towards facilitating teachers to analyze student assessment data technologically and then use it for diagnostic purposes in instruction. However, school principals fully supported teachers in sharing latest information about technology use in teaching and learning. School principals try to attend the professional development opportunities but they lack in implementing technology base management systems for assessing faculty, staff and student data. Diffusion, implementation and usage of technology has increased in every field of teachiing and learning. With this, more emphasis falls on assessment of the use in level of technology being incorporated. Decision makers at all levels need to know this so that a comprehensive evaluation program of technology incorporation in teaching, learning, management and for professional development may be adopted and implemented (Muhametjanova & Cagiltay,2016). In addition to this, findings also suggest that college principals' awareness and implementation of intellectual property rights and cyber security rights is towards lower side.

Conclusion

Although the scores of leadership technology competency scale manifested an average mean score on all sub scales, still it indicates that at least college principals have awareness about the importance of technology usage at personal and administratvie levels. In the current climate of educational accountability , it becomes imperative for educationa administrators to use ICT competency for assessing educational and staff data for paving ways towards organizational development. Leadership requires to provide the effective use of information and communication technology in the domains of educational assessment, support and management, ethical, social and legal issues for supporting and enriching instructional environment.

Recommendations

Leadership training programmes may contain modules related to professional use of databases, content and data management systems in order to enhance principals' use of these for day-to-day administrative purposes. In addition to this, principals may be trained to use information and communication technology for efficient use of technology based management systems to access personal records of faculty and staff for institutional improvement. Furthermore, supporting faculty and staff in using and connecting to technology systems for operations and management, such as curriculum management system and student information system needs to be addressed by the college principals. Last but not the least, upper management may provide comprehensive training to college principals about intellectual property rights, copy right issues, safety, privacy and cyber security related issues so that they can empower their students and teachers in these domains.

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