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LIMITATIONS AND IMPLICATIONS OF A STUDY ON THE USE OF INFORMATION AND TECHNOLOGY (ICT) IN AL-ULA SCHOOLS

Fahad Albalawi
General Directorate of Education in Madinah - Saudi Arabia

ABSTRACT: *This paper outlines the limitations and implications of a study on information and communication technology (ICT) in Al-Ula schools. In terms of limitations, the study was conducted using data only from urban, all-male schools in the Al-Ula district in Saudi Arabia, which may limit the generalizability of the findings to all-female or coed, countries other than Saudi Arabia and to rural schools. In addition, interview data was collected by telephone. Telephone interviews did not allow the researcher to notice the facial expressions and body language of participants as they gave their responses, and student perspectives were not included. The study demonstrated the importance of multiple factors that contribute to the ICT implementation process, including ensuring that appropriate technology is available, that staff are properly trained on its usage, that there is clear support for ICT at the national level, and that there is a strategic plan in place for its implementation. Potential avenues for research include a focus on all-female or co-ed schools, an emphasis schools undergoing an intentional change implementation process, inclusion of student perspectives, and more study on the pedagogical uses of ICT in Saudi Arabia.*

KEYWORDS: Information and communication technology (ICT), change implementation processes, education in Saudi Arabia, e-learning, professional development for teachers.

INTRODUCTION

There are some noteworthy limitations as they apply to the data collection, analysis, and findings of this study. First, the study was conducted using data only from urban, all-male schools in the Al-Ula district in Saudi Arabia. As such, the generalizability of the findings to all-female or coed schools may be limited, as might the generalizability to schools in countries other than Saudi Arabia and to rural schools. In addition, interview data was collected by telephone. While this data was rich and provided ample data for analysis, the telephone interviews did not allow the researcher to notice the facial expressions and body language of participants as they gave their responses. These nonverbal forms of communication may have offered clues to the participants' meaning that were not discernible over the telephone. These clues may have provided additional nuance and context that would have aided the researcher in the interpretation of meaning and the formulation of additional follow-up questions that may have been useful.

While the data collected offered insight into the perspectives of teachers and principals, there were limitations inherent in those perspectives, in that they do not allow us to understand ICT usage from the perspective of students. While the participants in this study sometimes attempted to assess the impact of ICT usage on students in their schools, assessing that impact from the perspective of

students directly would likely improve our understanding of ICT usage from the point of view of students. And finally, since this study primarily focused on the status of ICT usage as it existed at the time of the study, and not in schools clearly undergoing an ICT change implementation process, this study did not fully test all of the dimensions of Tearle's (2004) framework.

Implications of the Study

This study demonstrates the importance of multiple factors that contribute to the ICT implementation process. In this study, participants noted that they faced significant challenges in using ICT. Many of these challenges centered on a lack of fundamental resources needed to use ICT effectively, including slow internet, outdated or obsolete technology that was not properly maintained, a lack of technical support, and a lack of training. In addition, the findings from showed a lack of planning at the local school level, and a lack of direction at the Ministry level. Under these conditions, the schools did not appear to be implementing a clearly thought out ICT implementation strategy that had the necessary resources to carry out a set of articulated objectives.Tearle (2004) mentions the change process as an essential dimension of ICT implementation, yet this study was not able to identify a change process occurring at Al-Ula schools. That is, the schools did not appear to be undergoing a dynamic change process, but were rather static, stuck in a position that was determined by their circumstances.

This study demonstrates how, in order to undergo a clearly-identifiable change process, schools must have not only an overarching vision, but also resources and a plan to execute that vision. In this way, change implementation can be seen as analogous to Maslow's (1943) hierarchy of needs, wherein basic needs must be met before higher-order potential can be fully realized. In other words, the full potential of ICT use (i.e. more advanced use of instructional technology, more interactive and student-centered ICT) can only be accomplished after basic ICT resources are in place. Vision and planning are important, but resources are necessary to implement that vision. At the same time, this study shows that schools need more than just ICT resources. They also need training, planning, and vision. If schools had all of the resources they needed, but did not have the training and planning needed to use them, they would be less likely to use technology effectively.

Recommendations for Practice

With the findings from this study in mind, several recommendations for practice should be considered. This study makes a strong recommendation for increased resources for ICT, including more updated computers and faster internet access. Also, this study recommends that schools hire trained and qualified IT technical support staff to be located on school grounds in order to maintain and repair IT equipment. Teachers and principals in this study pointed to the challenges of using ICT without these resources, noting the limitations of attempting to use ICT without equipment and support. With this in mind, it is not surprising that improving these resources was one of their top recommendations. Therefore, this study recommends that principals and teachers continue advocating for these resources, lobbying the Ministry for the funding needed to acquire them. In doing so, principals and teachers should point to the Ministry's own stated vision/objectives for ICT use, and the improbability of realizing that vision with limited resources.

Though resources are necessary for effective ICT implementation, this study also points to the need for clear direction and/or a plan in order to use ICT effectively. Participants in this study indicated that a lack of policy and/or direction from the Ministry posed a challenge to ICT implementation, and recommended that a clear policy be provided. In addition to lobbying for more resources, this study recommends that principals and teachers lobby the Ministry for such a policy. Toward that end, Tondeur et al. (2008) offer multiple suggestions for what could be included in that policy, emphasizing the importance of a shared vision for ICT implementation that includes not only the objectives of the Ministry, but input from teachers and principals. As national plans are only as effective as their local implementation, school principals should be given training and guidance on how they might strategically translate national policy into local practice at their schools. At the same time, there might be more that individual schools can do to create a plan in lieu of direction from the Ministry. That is, rather than wait for direction from the Ministry, principals can leverage their leadership roles within their own schools to create a clear strategy and plan for using the technology that they currently have. They could, for example, form a committee to assess the resources they have, devise the best way to use those resources, and develop a plan that could be delivered and implemented schoolwide.

This study pointed to a need for training on ICT, which would become even more necessary if more advanced uses of ICT were to be implemented. At the time of the study, many participants appeared to have had some training, but mostly at a more basic level. In addition, teachers and principals in this study appeared to have gotten this training outside of school, often during their college years. Ideally, a training program would be provided by the Ministry, and it would be in alignment with an overall vision and objectives for ICT use, and this could be lobbied for along with the recommendations stated above. In the meantime, principals and teachers could consider the human resources that they currently have available in order to devise a training program at their own schools. This study revealed that schools had a range of experience and knowledge among their current employees when it comes to ICT, and some teachers and principals were much more knowledgeable about ICT use than others. These more knowledgeable employees could be tasked with devising and delivering a training program in alignment with the school's own resources and strategic plan, perhaps in exchange for an increase in salary, service credit, and/or some other incentive.

Recommendations for Future Research

This study also points to several recommendations for future research. These are as follows:

- This study focused on all-male schools in the Al-Ula school district. As such, it provided valuable insights into the current status and challenges facing those schools. The findings from the current study may be generalizable to other schools, but it could also be valuable to expand research beyond the population of this study, including all-female schools, schools in more rural areas, and schools in larger cities.
- While current study offered insight on the current status and challenges of ICT use, it did not focus on an ICT change process. If a clear change process were to be undertaken in the schools as a result of an explicit strategic plan, direction from the Ministry, and/or funding for additional resources, it would be valuable to analyze the implementation of that change and assess its impact.

This type of study would be in a good position to assess all of Tearle's (2004) dimensions within her change implementation framework.

- The current study asked participants to comment on the challenges they were facing with ICT implementation, but did not ask them directly how they were overcoming those challenges. Though some participants noted how they were working around the limitations they faced with their ICT resources (e.g. paying for their own equipment, tech-savvy principals and teachers maintaining computers), it might be useful to have a better sense of the resourcefulness of teachers and principals within the school districts in order to understand how they manage the resources that they do have, and therefore better understand how change might be implemented within the schools.
- As this study focused on the perspectives of teachers and principals, it deepened our understanding of how employees of Al-Ula schools used the technology they have. At the same time, the perspective of students is not well understood from this study. Assuming the ultimate goal of ICT use in schools is to improve the education of students, it would be useful to assess the impact of ICT usage on students, and to better understand what is working and what could be improved.
- With that goal in mind, studies that focus more directly on pedagogical uses of ICT could be valuable. It would be especially useful to know how teachers are using (or not using) ICT to create student-centered, interactive learning environments. In places where such an environment is in place, it would be useful to know how those environments are created and what effects they have on the students who are learning within them.

CONCLUSION

This study was conducted with the intention of discovering the current status of ICT usage within Al-Ula schools and the challenges that principals and teachers within the schools faced while using ICT, in order to make recommendations for how ICT usage might be improved. In addition, this study used Tearle's (2004) *A Theoretical and Instrumental Framework for Implementing Change in ICT in Education* as its framework. This framework viewed ICT change implementation from multiple dimensions within the organization, the individual, practical and material artefacts, and the change process. The emphasis of this framework is on the factors that make a change in ICT implementation successful. In using this framework, the current study was future-focused, looking toward a time when Al-Ula schools have the resources and strategic planning necessary to carefully implement change.

As it stood at the time of the study, ICT Al-Ula schools appeared to be vastly under-resourced, and IT usage was not carefully planned at either the Ministry or the local school level. As such, the possibility of creating meaningful change in ICT implementation appeared to be unlikely at the time at the study. Some of the challenges presented by participants (e.g. slow internet, lack of technical support and maintenance) indicated that they had difficulty using ICT in relatively basic ways. Certainly, the schools were not in a good position to work with ICT in more advanced ways, including creating the kind of student-centered, interactive learning environment discussed by multiple scholars (Pall & Batra, 2016; Pelgrum, 2001; Edwyn; 2001) and the Ministry itself

(*Education and Vision 2030,*2019). In order to implement change at that level, Al-Ula schools would need a substantial increase in funding, resources, and training. And, they would need a more carefully planned and implemented change process.

REFERENCES

Abuhmaid, A. (2011). ICT training courses for teacher professional development in Jordan. *Turkish Online Journal of Educational Technology-TOJET*, *10*(4), 195-210.

Al-Asmari, A. M., & Rabb Khan, M. S. (2014). E-learning in Saudi Arabia: Past, present and future. *Near and Middle Eastern Journal of Research in Education,* 1–11. doi:10.5339/nmejre.2014.2

Albirini, A. (2006). Teachers' attitudes toward information and communication technologies: The case of Syrian EFL teachers. *Computers & Education, 47,* 373–398. doi:10.1016/j.compedu.2004.10.013

Albugami, S. (2016). *Developing a strategic approach to ICT implementation in Saudi secondary schools*(Unpublished doctoral dissertation). University of Salford, Salford, United Kingdom. Retrieved from http://usir.salford.ac.uk/id/eprint/40206/

Al-Hazmi, S. (2003). EFL teacher preparation programs in Saudi Arabia: Trends and challenges. *Tesol Quarterly, 37,* 341–344. doi:10.2307/3588509

Al Mofarreh, Y. I. (2016). *Implementation of ICT policy in secondary schools in Saudi Arabia* (Unpublished doctoral dissertation). University of Wollongong, Wollongong, Australia. Retrieved from https://ro.uow.edu.au/cgi/viewcontent.cgi?referer=&httpsredir=1&article=5731&context=theses

Al Mulhim, E. (2014). The barriers to the use of ICT in teaching in Saudi Arabia: A review of literature. *Universal Journal of Educational Research, 2,* 487–493. doi:10.13189/ujer.2014.020606

Alqarni, A. A. (2015). Educational technology in Saudi Arabia: A historical overview. *International Journal of Education, Learning and Development, 3*(8), 62–69. Retrieved from http://www.eajournals.org/wp-content/uploads/Educational-Technology-in-Saudi-Arabia.pdf

Alshammari, N. (2014). The use of technology in education to improve student's reading skills in elementary schools. *Saudi Arabia International Journal of Business and Social Science, 5*(6), 69–71. Retrieved from http://www.ijbssnet.com/journals/vol_5_no_6_may_2014/6.pdf

Alwani, A. E. S., & Soomro, S. (2010). Barriers to effective use of information technology in science education at Yanbu Kingdom of Saudi Arabia. In S Soomro (Ed.), *E-learning experiences and future* (pp. 35–46). Rijeka, Croatia: In Tech. Retrieved from https://www.researchgate.net/publication/221908579_Barriers_to_Effective_use_of_Information_Technology_in_Science_Education_at_Yanbu_Kingdom_of_Saudi_Arabia

Asan, A. (2003). Computer technology awareness by elementary school teachers: A case study from Turkey. *Journal of Information Technology Education: Research, 2,* 153–164. doi:10.28945/319

Barriball, K. L., & While, A. (1994). Collecting data using a semi-structured interview: A discussion paper. *Journal of Advanced Nursing, 19,* 328–335. doi:10.1111/j.1365-2648.1994.tb01088.x

British Educational Communications and Technology Agency (BECTA). (2004). *A review of the research literature on barriers to the uptake of ICT by teachers.* Retrieved from http://dera.ioe.ac.uk/1603/1/becta_2004_barrierstouptake_litrev.pdf

Burnard, P. (1991). A method of analysing interview transcripts in qualitative research. *Nurse Education Today, 11,* 461–466. doi:10.1016/0260-6917(91)90009-y

Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process.* London, England: Sage.

Edwyn, J. (2001). *Learning to change: ICT in schools. Schooling for tomorrow: Education and skills*. Paris, France: OECE.

Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education, 59,* 423–435. Retrieved from10.1016/j.compedu.2012.02.001

Etikan, I., Alkassim, R., & Abubakar, S. (2016). Comparision of snowball sampling and sequential sampling technique. Biometrics & Biostatistics International Journal, 3(1), 1-2.

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report, 8,* 597–606. Retrieved from https://nsuworks.nova.edu/tqr/vol8/iss4/6/

Hampton, K., & Wellman, B. (2003). Neighboring in Netville: How the Internet supports community and social capital in a wired suburb. *City & Community, 2*(4), 277–311. doi:10.1046/j.1535-6841.2003.00057.x

Howley, A., Wood, L., & Hough, B. (2011). Rural elementary school teachers' technology integration. *Journal of Research in Rural Education, 26*(9), 1–13.Retrieved from http://jrre.vmhost.psu.edu/wp-content/uploads/2014/02/26-9.pdf

Jamsheed, M. (2015). A look back at the discovery that changed the Kingdom. Saudi Aramco. *Dimension International,Summer,* 2–5.
Retrieved from https://imgsrv2.aramcoexpats.com/pipeline/magazines/pdf_dimensions-international-summer-2015-part2-p4-7.pdf

Kalonde, G. (2017). Technology use in rural schools: A study of a rural high school trying to use iPads in the classroom. *Rural Educator, 38*(3), 27–38. Retrieved from http://epubs.library.msstate.edu/index.php/ruraleducator/article/view/330/401

Khan, M. S. H., Hasan, M., & Clement, C. K. (2012). Barriers to the introduction of ICT into education in developing countries: The example of Bangladesh. *International Journal of Instruction, 5*(2), 61–80. Retrieved from https://files.eric.ed.gov/fulltext/ED533790.pdf

King, K. P. (2002). Educational technology professional development as transformative learning opportunities. *Computers & Education, 39*(3), 283–297. doi:10.1016/S0360-1315(02)00073-8

Maslow, A. H. (1943). A theory of human motivation. *Psychological review*, *50*(4), 370.

Mathers, N., Fox, N., & Hunn, A. (2007). *Surveys and questionnaires.* Nottingham and Sheffield, England: The NIHR RDS for the East Midlands/Yorkshire & the Humber. Retrieved from https://www.rds-yh.nihr.ac.uk/wp-content/uploads/2013/05/12_Surveys_and_Questionnaires_Revision_2009.pdf

Ministry of Education, Saudi Arabia. (n.d.). *Education and Vision 2030.* Retrieved from https://www.moe.gov.sa/en/Pages/Vision2030.aspx

Ministry of Education, Saudi Arabia. (2019). *Home.* Retrieved from https://www.moe.gov.sa/en/Pages/default.aspx

Ministry of Higher Education, Kingdom of Saudi Arabia. (2006). *Saudi Arabian cultural mission to the U.S.A.* Washington, DC: Saudi Arabian Cultural Mission to the U.S.A.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108,* 1017–1054. Retrieved from http://one2oneheights.pbworks.com/f/MISHRA_PUNYA.pdf

National Center for e-Learning and Distance Learning. (2019). *About us.* Retrieved from http://www.elc.edu.sa/?q=en/aboutus

National Education Association (2019). *Professional development.* Retrieved from http://www.nea.org/home/30998.htm.

Oyaid, A. (2009). *Education policy in Saudi Arabia and its relation to secondary school teachers' ICT use, perceptions, and views of the future of ICT in education* (Unpublished doctoral dissertation). University of Exeter, Exeter, England. Retrieved from https://ore.exeter.ac.uk/repository/bitstream/handle/10036/69537/OyaidA.doc.pdf?sequence=2

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health, 42*(5), 533–544.

Pall, A. S. & Batra, R. (2016). Adoption of ICT in instructional setup of Indian school education sector. *GianJyoti Journal, 6*(2), 76–87. Retrieved from https://www.gjimt.ac.in/wp-content/uploads/2017/10/Roopali_Amanpartap_Adoption-of-ICT-in-Instructional-Setup-of-Indian-School-Education-Sector.pdf

Patton, M. Q. (2002). *Qualitative evaluation and research methods* (3rd ed.). Thousand Oaks, CA: Sage.

Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: Results from a worldwide educational assessment. *Computers & Education, 37,* 163–178. doi:10.1016/s0360-1315(01)00045-8

Poggenpoel, M., & Myburgh, C. (2003). The researcher as research instrument in educational research: A possible threat to trustworthiness? *Education, 124*(2), 418–421, 320. Retrieved from https://www.questia.com/library/journal/1G1-112480018/the-researcher-as-research-instrument-in-educational

Saudi Vision 2030, Kingdom of Saudi Arabia. (2019). *Home.* Retrieved from https://vision2030.gov.sa/en/node

Sundeen, T. H., & Sundeen, D. M. (2013). Instructional technology for rural schools: Access and acquisition. *Rural Special Education Quarterly, 32*(2), 8–14. doi:10.1177/875687051303200203

Tearle, P. (2004). A theoretical and instrumental framework for implementing change in ICT in education. *Cambridge Journal of Education, 34,* 331–351. doi:10.1080/0305764042000289956

Tondeur, J., van Keer, H., van Braak, J., & Valcke, M. (2008). ICT integration in the classroom: Challenging the potential of a school policy. *Computers & Education, 51,* 212–223. doi:10.1016/j.compedu.2007.05.003

United States Department of Education. (2018). *Future ready schools: Building technology infrastructure for learning.* Washington, DC: Office of Educational Technology, Department of Education. Retrieved from https://tech.ed.gov/futureready/infrastructure/

Vareberg, K. R. (2016). *It's easy until it's not: Elements contributing to rural teachers' technology use* (Unpublished master's thesis). North Dakota State University, Fargo, North Dakota. Retrieved from https://library.ndsu.edu/ir/bitstream/handle/10365/27967/It%27s%20Easy%20Until%20It%27s%20Not%20Elements%20Contributing%20to%20Rural%20Teachers%27%20Technology%20Use.pdf?sequence=1&isAllowed=y

Zhao, Y. & Cziko, G. A. (2001) Teacher adoption of technology: a perceptual control theory perspective, *Journal for Technology and Teacher Education, 9*(1), 5-30.