The Role of Information and Communication Technology in Public Sector Administration: The Readiness of the Local Authorities in the Arab Sector in Israel.

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Abstract

This research paper investigates the readiness and integration of ICT in local authorities' administrative processes and service delivery. This is an important topic to explore, given the technological stalemate that is currently witnessed in the Israeli Arab localities. This has caused a significant hindrance to the successful fulfillment of public administrative functions in a rather "technologically advanced" country in the Middle East. Essentially, this research aims to review the incorporation of ICT in the Arab sector in relation to the articulation of the same in Jewish localities. To obtain these results, this study explores qualitative and quantitative research designs, interviews, and surveys with stakeholders and teachers in Arab schools. The results from this research will be used to examine the preparedness level of the Arab public sector in harnessing ICT potential. It also assesses the challenges the local authorities face in leveraging Israel's ICT potential by specifically focusing on the level of digital literacy Arab education sector. The data findings indicate a low-to-moderate degree of ICT integration among teachers, highlighting the importance of pedagogical knowledge and attitudes toward change in facilitating successful ICT implementation. Further, the study contributes to the understanding of ICT utilization in public sector administration and provides recommendations for overcoming obstacles and improving ICT practices in the Arab sector of Israel.

Keywords: Israeli-Arab sector, data, ICT readiness, local authorities, education, CT potential, public sector, pedagogical knowledge

Introduction

According to Seif (2020), Information and communication technology has revolutionized how organizations interact with citizens, stakeholders, customers, and partners. With the help of Information and communication technology, people can easily navigate their daily routines and fulfil their needs. Even so, the public sector is essential in developing a country and delivering public services. The public sector is the frontline implementer of a country's development agenda and citizens' satisfaction and happiness (Shonfeld et al., 2013). As such, it is imperative to harness Information and communications technology in the service delivery chain. Providing efficient, effective, and prompt public service delivery has been a significant challenge for public sector administrations worldwide. Thus, this makes the role of information and communication

technology in public sector administration crucial in recent times as it has played a significant role in achieving the desired results by reducing transactional costs, enhancing service quality, and accelerating service delivery time frame.

Initially, Israel's information and technology developments were fueled by the desire to meet its geopolitical needs. Essentially, research and development significantly impacted the start of Israel's industrial sector, science, and engineering in the higher institutions of learning, the research community, and the structure of the ICT workforce (Shonfeld et al., 2013). Today, the Israeli government's explicit aim has been to position Israel at the centre of innovation and technology throughout its sectors. Since the country's first ICT sector developments in the 1970s, the government has laid a solid foundation to ensure that private entities see the need to invest heavily in ICT by providing and building much-needed human capital (Lissitsa, 2021). Many other multinational companies share significant research spending in the Israeli industry. These include famous and well-known cooperation such as IBM, Cisco, Google, Phillips, Motorola, Apple, and many others that brought colossal sums of Foreign Direct Investment (FDI) and set up research centres across Israel to utilize local talents.

As an integral societal aspect today, ICT offers transformative and reformative possibilities within public sector administration (Lissitsa, 2021). By incorporating relevant technologies, efficient service delivery, transparency and accountability, and more improved administrative processes are expected to emerge. Governments worldwide have been increasingly embracing technology adoption regarding administration functions; however, progress has yet to be universal as disparities occur between region or sector implementation readiness levels. Concerning local authorities in the Arab sector of Israel - home to approximately 21% of the country's population - these officials' preparedness for embracing innovation via effective ICT systems is all too important when it comes to meeting increasing service demands and keeping up with a constantly evolving infrastructural ecosystem within those communities. There is a need for a systematic analysis of the circumstances affecting ICT readiness in Arab local authorities, particularly emphasizing the use and integration of ICT in administrative processes and public service delivery.

ICT readiness relates to an organization's ability to effectively utilize ICT by integrating various technologies into its daily operation. Several factors external to the organization may affect its level of ICT readiness. These factors include the availability of information and communication technologies, the organizational culture, resources, and technological infrastructure. Further factors influencing ICT readiness include the ability to formulate strategic plans for ICT uptake in the organization's context and to formulate appropriate policies regarding ICT use. Organizations needing to adapt to changing technology tend to need to catch up to competitors. Their decision-making processes are also adversely affected as they often need more effective models for executing projects on time. Given these inherent limitations, organizations must adopt a comprehensive approach to ensuring adequate resources for ICT adoption and integration into their operations.

Although everyone recognizes how beneficial it is for public administrations to leverage Information and Communication Technologies (ICTs), we must also examine whether or not local officials are prepared or capable enough to adopt this technology—especially within particular geographic regions or specific cultural communities like Israel's Arab populace by investigation ICT program implementation in schools in Arab minority neighbourhoods. We must investigate schools' preparedness level to embrace ICT programs in their curriculum while recognizing any blockages or obstacles standing between them and success when utilizing technological processes effectively.

Knowledge Gap

Education on the importance of articulation and implementation of ICT programs remains the main problem hindering the readiness of local authorities in the Arab sector. Still, despite vast amounts of scholarly research focusing on the adoption of ICTs, little seems to be published concerning the understanding of the readiness of local authorities in the Arab sector in Israel. Overreaching objectives that need to be addressed is to what extent are the local authorities in the Arab sector in Israel ready to harness the potential of ICT in public sector administration? This study aims to discover factors influencing how much has already been adopted when implementing such technologies throughout their respective locales. Additionally, this study's extensive goal also intend to recommend optimal strategies for overcoming any challenges impeding progress towards desired

outcomes efficiently and effectively in implementing ICT best practices within governmental structures as far as the Arab sector is concerned.

Literature Review

The application of ICT has been identified as a critical factor in strengthening administrative procedures across various local authorities. According to research by Shamah (2014), implementing digitalization and automation techniques via ICT can mitigate bureaucratic obstacles while bolstering operational efficiency within Israeli Arab local authorities. As a result, permit and license issuance processes and other similar procedures are now expedited with heightened precision. Also, ICT is recognized as a crucial factor in improving service delivery among Arab sector local authorities. In light of this goal, Habiballah et al. (2021) research on e-government initiatives sheds light on the success of these programs in Israeli municipalities. Implementing online portals and digital platforms for residents to use when accessing Information or communicating with government agencies, such as submitting requests or asking questions about different services available, has improved efficiency at every level while keeping a solid focus on citizens' needs.

Numerous studies confirm that ICT is pivotal in enhancing transparency and fostering good governance within academic institutions at the grassroots level. According to Habiballah et al. (2021), their extensive use empowers local authorities by providing open data portals alongside online platforms that give Israeli citizens unrestricted access to crucial Information such as budgets and policies, among other valuable resources. This measure fosters citizen engagement and enhances accountability by building stakeholder trust, ultimately contributing to more effective governance practices.

Hoffman (2022), a journalist for the Jewish News Syndicate, conducted an investigative report concerning the revolution taking place in the Israeli Arab sector to determine the level of expectation and aspiration for the self-realization of Arabs citizens as far as modernization and technology are concerned. Hoffman's findings indicate that the modernization of the Israeli Arab sector has been significant, with most of the work made by leveraging innovative technologies and readily available digital channels. This explains the increasingly growing number of start-ups founded in Arabic-speaking localities such as Tira, Rahat and Negev. This budding cluster inspires more employment

opportunities for their region while nurturing its tech ecosystem viably. From being subjected to information scarcity limiting knowledge acquisition about other cultures, now better access is swiftly gained, broadening exchanges and promoting cross-cultural assimilation. Hoffman further claims that Education has emerged as a crucial aspect driving modernization within the Arab sector. Notably, more Arabs are taking up higher studies across different institutions within Israel and abroad. By engaging in quality education resources, Arab minorities have gained valuable skills and experienced professional and economic progress. As such, one can observe a surge in the number of Arabs serving diverse roles within various industries that contribute immensely to community development.

A report by Shamah (2014) presents an encouraging outlook on Israeli's technological growth. Ranked at number 15 on the Networked Readiness Index, it is evident that Israel is succeeding in tapping into digital capabilities to drive development in business and society. In particular, it is commentating for consistently leading regional rankings with its stable approach to utilizing technology. Fundamentally, the Networked Readiness Index ranking was formulated by amalgamating data from public domains and inputs derived through an Executive Opinion Survey (Shamah, 2014). This comprehensive survey involved over 15,000 executives who responded to meticulously crafted questionnaires annually.

Israel remains a powerful force within Research & Development (R&D) and innovation areas alongside ICT utilization in business, securing impressive rankings for their leadership among these fields worldwide (Cspconlutasenglish, 2022). One such facet involves measurements taken regarding patented technologies per capita by the country, where multiple reports suggest Japan (118.9), Finland (110.1), Sweden (88.8), and South Korea(87.8), with Israel, following closely in fifth place (79.4) Shamah (2014). Although placed below other countries on quality rankings, Israel ranks 3rd alongside powerful global economies like Germany, the USA, and Japan when considering how well these developed technologies are utilized and their potential implementations.

Cultural ingenuity indicators indicate that many Israeli firms fare exceptionally well when integrating upgraded technological resources into their business operations,

holding steady at fifth place globally, where e-participation resources are available at high-quality levels, together with government information about technological advancements shared online (Cspconlutasenglish, 2022). Furthermore, excellent performance in Venture Capital Availability (VCA) (8th place) combined with government-provided incentives for purchasing recent advancements places them ninth overall on the said list, improving progressively through using newly designed technological innovations efficiently (Shamah, 2014). This shows that Israel is on the right track, the path to championing innovation and technology across all its populace and public administrations.

While Israel proudly showcases itself as a highly advanced nation compared to surrounding countries such as Iran, it faces considerable drawbacks that create room for further researchers to explore. These drawbacks have far-reaching negative consequences on local authorities' preparation to grasp Information and technology in the Arab sector fully (Inter-Agency Task Force, 2022). This includes factors such as bureaucratic hurdles hampering Arab communities' preparedness. Regretfully, these factors are not new. These challenges have been there since the 18th century and continue to manifest themselves through several dimensions, like elaborate administrative procedures that significantly consume resources or slow down decision-making systems contributing to further delays along with inadequate distribution of resources. Shamah (2014) highlights how these bureaucratic obstacles create unforeseen bottlenecks, making enacting beneficial projects or initiatives nearly impossible. Eventually, this causes significant harm by reducing development progress and technological preparedness within nearby less-developed Arab localities.

Hitman (2019) points out that a considerable disparity persists between what computers could offer Education through the ICT revolution's promise of a new era of learning and what is implemented in Arab schools. The longstanding budgetary discrimination complicates an already challenging situation for educators hoping to bring positive change. Simultaneously though, According to Hitman (2019), there are several encouraging trends concerning computer usage among both students & teachers: increased access paired with targeted computer-skill-building programs and favourable policy changes have resulted in educators increasingly using computing technologies for

more fundamental educational activities like writing papers, creating slides for presentation, researching online sources or communicating using electronic mail.

Soleman & Danaiata (2018) have determined that several key factors impact ICT integration in education systems. These include beliefs about the role of technology in teaching, abilities, and perceptions towards digital environments. These elements exert a significant effect on incorporating ICT into classroom instruction techniques as well as adapting teaching methods at schools. Soleman & Danaiata (2018) observe that numerous Arab local authorities encounter difficulties due to their lack of preparedness to embrace this technological change. In addition to these aspects, Habiballah et al., 2021) research highlights how significant adjustments such as restructuring class distribution or modifying physical infrastructure may be necessary for fundamental progressions within educational contexts.

Material and Methods

The main reason facing the preparedness and successful implementation of ICT programs among the Israeli Arab minority is the lack of schools to fully integrate ICT programs into their curriculum. However, this falls entirely on the teacher's pedagogic knowledge level. To determine the challenges faced by ICT development, our study pursues qualitative and quantitative scientific research techniques with insights from trusted professionals through semi-structured interviews around several key aspects related to our analysis. This exploration will encompass views from local authority decision-makers, important department staff members, and community representatives who are vital partners within the public administration sector. Our findings will focus on stakeholders' views on what role digital innovation plays throughout public administration processes; identifying any significant hurdle hindering smooth technical usage; specific measures suitable for addressing any difficulties witnessed; readiness levels of local authorities regarding adequate ICT support.

Procedure

Our research focuses on assessing employees and officials serving in local authorities, specifically within the Arab sector of Israel, specifically teachers. Intending to achieve reliable results, we have chosen 400 participants as our sample size by employing

a stratified random sampling technique. To represent all groups fairly, we have carefully selected individuals from different localities proportional to their populations, with particular attention given to including diverse job roles and hierarchical levels within each locality.

Out of the 400 participants, 147 are teachers from 20 different elementary schools in Negev Bedouin regions; they all participated in the ICT program during the academic year of 2013. Notably, every teacher under this initiative can access an individual computer system. Also, the selected primary schools are based in regions with a low-moderate socio-economic status causing a limited availability of personal computers among students outside of school hours. However, the study assumes that this factor does not deter learning progress. The chosen schools have active and government-supported computer labs within each school's premises where classroom instructors guide pupils while providing online assignments.

Research Tools

A self-report questionnaire model based on Archambault & Barnet (2010) framework was administered to obtain the necessary information for this research. The main part of this survey gathered Israeli Arab demographic information about respective participants and consisted of several other segments as well.

Knowledge of pedagogic content

Mishra &Koehler (2009) contend that creating a solid conceptual framework for successful instruction necessitates embracing the concept of good pedagogic knowledge and thus impact readiness into ICT articulation. This means recognizing that outstanding teaching depends on understanding how content, pedagogy, and technology interact. The synergy among all three spheres becomes paramount to achieving excellent educational results.

Questionnaire design

A questionnaire was designed according to Avidov Ungar and Friedman (2015) to explore the correlation between teachers' pedagogical knowledge and technological content and their attitudes toward change. Furthermore, the study investigated the relationship between teachers' perception of their school as a learning organization and

their attitudes toward change. The questionnaire specifically sought to understand how these variables impact each other and can contribute to positive change within educational institutions.

Questionnaire implementation

The study presented an ICT Implementation questionnaire derived from Avidov Ungar and Friedman (2015) work. Their research investigated variables such as skill level, attitudes toward ICT, and differences in ICT implementation among teachers working in schools that demonstrated regular use of ICT. This questionnaire aims to further build upon their findings and provide a tool for researchers exploring ICT articulation among many similar topics.

Data Analysis

SPSS software was utilized to conduct analyses in this study. Descriptive statistics were employed for data coding and statistical processing, examining prevalence distribution, averages, standard deviations, and standard and distribution ranges. Pearson's coefficients were also used to identify connections between various research variables.

Findings

After gathering insights from teachers, it has surfaced that there is a moderate-to-high degree of ICT integration being administered by these educators within their schools. Table below encapsulates vital information, including the mean score, which is an impressive 3.73 out of the total score range (1-5). The data set also highlights additional metrics, such as standard deviation and mean, that pertain to effective utilization and deployment strategies for leveraging technology.

Table 1: Standard Deviations, Average, Minimum and Maximum Scores in the ICT Implementation

Variable	N	Average	Standard Deviation	Min. Score	Maximum score
ICT Implementation	147	3.73	0.69	2.05	5.00

Level of Technological knowledge

According to Seif (2020), the level of Technological knowledge among the Israeli-Arab minority affects its readiness of the local authorities to fully articulate ICT into public administration functions. Teachers have displayed a high level of contextual and general pedagogic knowledge and specific expertise, with scores reaching an average of 4.18 out of 5 for contextual information and an average score amounting to around 4 for general and particular information on teaching techniques, respectively.

While there is room for improvement concerning technology-related skills, with only a mere scoring tally totaling only about half that amount at around, approximates out of five on the learning scale. However, they maintain considerable expertise regarding lessons incorporating modern technology and possess a moderate proficiency rating that averages nearly three-and-a-half points, which may indicate some aptitudes popularized by recent teaching innovations.

Relationship between technological knowledge and implementation of ICT

The findings demonstrate a positive connection between all forms of understanding developed around new technologies and their integration into modern learning environments, such as ICT programs within school settings, reflecting how elevated levels of technology-specific training among educators are crucial to advancing digital adoption in the entire Isareli Arab public sectors. In particular, notable among these various categories included heightened understanding concerning technology-focused lesson plans alongside improved skills working with advanced technical tools as well as high-level tech proficiency. These results can be viewed in more extensive detail within Table 2 provided below.

Table 2. Pearson's Correlation between Technological Pedagogical

Knowledge and Implementation in ICT

ICT Knowledge	ICT Program Implementation
Knowledge in the field	0.27*
Technological knowledge	0.19*

Discussion

This academic research explored the extent of teacher knowledge necessary for successfully integrating ICT into classroom instruction among the Israeli Arab minority and compared it with existing researches on ICT articulation among the majority Jewish schools. Furthermore, our research examined whether an educator's willingness to adapt to ICT despite needing more expertise impacted implementation effectiveness in the general Israeli-Arab public sector. The results after comparison with some existing resources about ICT implementation in Jewish schools indicated that higher levels of technological pedagogic knowledge positively influenced computer assimilation in the public sector.

The research further indicates that there are essential distinctions between school roles and the implementation of ICT. In particular, there was a notable difference between educators and professional teachers, with educators reporting a higher degree of ICT implementation between the two communities. Additionally, the variance was observed among experienced teachers specializing in English versus science; the latter group said greater levels of program implementation. One possible explanation for these observations is that ICT training may focus more on classroom educators than professional teachers. It is also plausible that the performance of ICT in schools is still at an early stage and, therefore, still needs to be fully adopted by all professional teachers. Another noteworthy finding is the relationship between the attitude of teachers towards the change to ICT programs and their degree of assimilation in schools: those who hold more positive attitudes towards such change are more likely to implement it effectively (Soleman, 2020). Interestingly, there is a moderate correlation between emotional or cognitive domains versus behavioral fields. This implies that teachers may express

support for change while not necessarily demonstrating it in practice. This demonstrate that the willingness among teachers to embrace change alongside their pedagogic knowledge and confidence in its purpose is crucial for effective ICT program implementation and adoption and thus proactive improving readiness for technological advancement among the local authorities of the Israeli-Arab sector. The results of this research points to several factors that contribute to this problem. They include;

Digital connectivity

Digital connectivity depends on an adequate infrastructure of internet components and other relevant equipment. However, the comparison shows that Jewish localities enjoy far more developed internet infrastructure than their Arab counterparts who face challenges like slow connection speeds or lack of connectivity, especially in Bedouin localities in the Negev region. Further research conducted by the Israel Internet Association reveals that most network systems supporting businesses within the Arab sector lack adequate security measures or suffer from significant instability problems.

Further concerns have been raised regarding placing Wi-Fi service points across various Bedouin communities amidst a significant geographic spread and limited electric supply, notably in "unrecognized" villages as noted by public sector officials from the Negev. Less than 50% of Arab societies have access to computers compared with around 80% of Jews who do have one, as shown by data from 2018 (Inter-Agency Task Force, 2022). Additionally, almost 140,000 Arab students are completely without computer access (Inter-Agency Task Force, 2022).

Language and cultural diversity

The language and cultural diversity between Hebrew-dominant Israelis and their Arab minority peers create persistent obstacles that impact communication and fundamental access to crucial resources such as those found online. This need is highlighted vividly by events like the coronavirus upheaval when officials at Israel's Ministry Of Health were unable initially to release emergency guidelines timely enough for many who needed it most, resulting in understandable frustration and anxiety (Inter-Agency Task Force, 2022). Adding to this frustration were initial shortages of locally spoken Arabic dialects in the published guidelines, further undermining the trust and

efficacy of these instructions. This problem also persists beyond health emergencies and is evident in the report prepared by Israel's research committee, where nine government branches had not yet incorporated Arabic materials on their websites while eight others had only limited available channels for members of the Arab community anxiety (Inter-Agency Task Force, 2022).

Conclusion and Recommendation

In today's technology-dependent world, Israel must prioritize developing digital literacy and problem-solving abilities in this area. Unfortunately, Israel currently falls below the Organization for Economic Cooperation and Development (OECD) and Program for the International Assessment of Adult Competencies (PIACC) average concerning this skillset. Additionally, among the population group intensively challenged by this particular challenge are Arab citizens. They face almost four times higher odds of needing more necessary technological capacities or experience than their Jewish counterparts. Developing digital literacy now is essential for integrating Arabs into advanced professions that can operate online and complement daily activities such as banking and purchasing goods and services remotely. It will also help support children's distance learning needs. This will be proactive in enhancing ICT readiness in the Israeli Arab public sector given today's challenges.

The outcomes of this investigation accentuate the necessity of perceiving pedagogical methods as essential throughout any change made regarding ICT. While technological advancements may be at the forefront, educators must emphasize their teaching methods, which remain a fundamental aspect in adopting and executing new educational technologies especially among the Arab minority.

References

Archambault, L., & Barnett, J. T. (2010). Revisiting technological pedagogical content knowledge: Exploring the TPACK framework. *Computers & Education*, *55*(4), 1656–1662. https://doi.org/10.1016/j.compedu.2010.07.009

Habiballah, S., Bibu, N., & Danaiata, D. (2021). Educational Leadership and ICT Implementation in Israeli Arab Sector-towards a Model of Hybrid Leadership. *Revista de Management Comparat International*, *22*(1), 74-86. https://www.rmci.ase.ro/no22vol1/06.pdf

Hitman, G. (2019). Israel's policy towards its Arab minority, 1990–2010. *Israel Affairs*, *25*(1), 149-164. https://www.tandfonline.com/doi/full/10.1080/13537121.2018.1554871

Lissitsa, S. (2021). Effects of digital use on trust in political institutions among ethnic minority and hegemonic group – A case study. *Technology in Society*, *66*, 101633. https://doi.org/10.1016/j.techsoc.2021.101633

Seif, A. A. (2020). Arab Pre-service Teachers' Perspectives on the Role of ICT in Learning and beyond School. *European Journal of Interactive Multimedia and Education*. https://doi.org/10.30935/ejimed/9138

Shamah, D. (2014.). *Report says: Israeli tech strong, bureaucracy weak*. Www.timesofisrael.com. Retrieved May 27, 2023, from https://www.timesofisrael.com/report-says-israeli-tech-strong-bureaucracy-weak/

Shonfeld, M., Hoter, E., & Ganayem, A. (2013). Connecting Cultures in Conflict through ICT in Israel. *ResearchGate*. https://www.researchgate.net/publication/314230388_Connecting_Cultures_in_Conflict_through_ICT_in_Israel

Soleman, H. A. (2020). Administrative Policy in Primary Schools in The Arab Sector in Israel as a Result of their Attitudes towards the Integration of the National ICT Program in Teaching. *Eph-International Journal of Educational Research*, *4*(1), 25-31. https://doi.org/10.53555/ephijer.v2i2.26

Soleman, H. A., & Danaiata, D. (2018). The Factors that Affect the Process of Integration and Application of the ICT Program in the Arab Education System in

Israel. *Revista de Management Comparat International*, *19*(2), 145-153.

https://www.rmci.ase.ro/ro/no19vol2/05.pdf

Harris, J., Mishra, P., & Koehler, M. (2009). *(PDF) What Is Technological Pedagogical Content Knowledge?* ResearchGate.

https://www.researchgate.net/publication/241616400_What_Is_Technological_Pedagogical_Content_Knowledge

Jaffe-Hoffman, M. (2022, March 17). *'Revolution' taking place among Arab sector in Israel, report shows - JNS.org*. JNS.org. https://www.jns.org/revolution-taking-place-among-arab-sector-in-israel-report-shows/

Cspconlutasenglish. (2022, August 4). *Israel occupation impedes the right to access and to quality of communication*. CSP-Conlutas.

https://cspconlutas.org/2022/08/04/israel-impedes-the-right-to-access-and-to-quality-of-communication/

Inter-Agency Task Force. (2022, November 1). *Digital Gaps and Accessibility for Arab Society: From Connec . . .* https://www.iataskforce.org/activities/view/1075