An Evaluation Of The Function Of Information And Communication Technologies In The Spread Of Technical Knowledge; An Employee Centered Analysis

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ARTICLE INFO	ABSTRACT
	Information and Communication Technologies (ICTs) have revolutionized the way technical knowledge is disseminated and accessed across the globe. This paper explores the strategic role of ICTs in facilitating the spread of technical knowledge, encompassing various aspects such as education, innovation, collaboration, and economic development. By leveraging ICTs effectively, individuals, organizations, and societies can harness the power of information exchange to accelerate learning, foster innovation, and drive socio-economic progress. The dissemination of technical knowledge through ICTs is instrumental in overcoming geographical barriers and democratizing access to education and information. Online learning platforms, digital libraries, and open educational resources (OERs) provide learners with unprecedented opportunities to acquire technical skills and knowledge regardless of their location or socioeconomic background. The authors emphasize the potential of IT to enhance transparency, efficiency, and citizen engagement in the public sector. "Paradigm Shift" presents a compelling vision of the transformative power of information technology, heralding a new era of innovation, collaboration, and economic growth. **Keywords:** (ICTs), Technical knowledge, education, innovation, collaboration, economic development, online learning, open educational resources (OERs), virtual collaboration, open innovation, entrepreneurship, knowledge-based economies.

Introduction

ICTs facilitate collaborative learning and knowledge sharing among students, educators, and experts across different disciplines and geographical locations. Virtual collaboration tools, such as video conferencing, online forums, and collaborative software platforms, enable individuals to collaborate on technical projects, exchange ideas, and co-create knowledge in real-time. By fostering a culture of collaboration and open innovation, ICTs stimulate creativity, problem-solving, and knowledge creation, driving continuous advancement in technical fields. ICTs play a crucial role in accelerating the pace of innovation and scientific discovery by facilitating the exchange of research findings, data, and insights among scientists, researchers, and practitioners. Digital repositories, scientific databases, and online research networks enable researchers to access a vast array of technical literature and datasets, accelerating the process of knowledge discovery and innovation. The collaborative research platforms and virtual laboratories allow scientists to collaborate on complex technical challenges, conduct experiments remotely, and share resources and expertise, leading to breakthroughs in various fields such as biotechnology, nanotechnology, and renewable energy.

Figure: 01 Strength of influence of factors on ICT
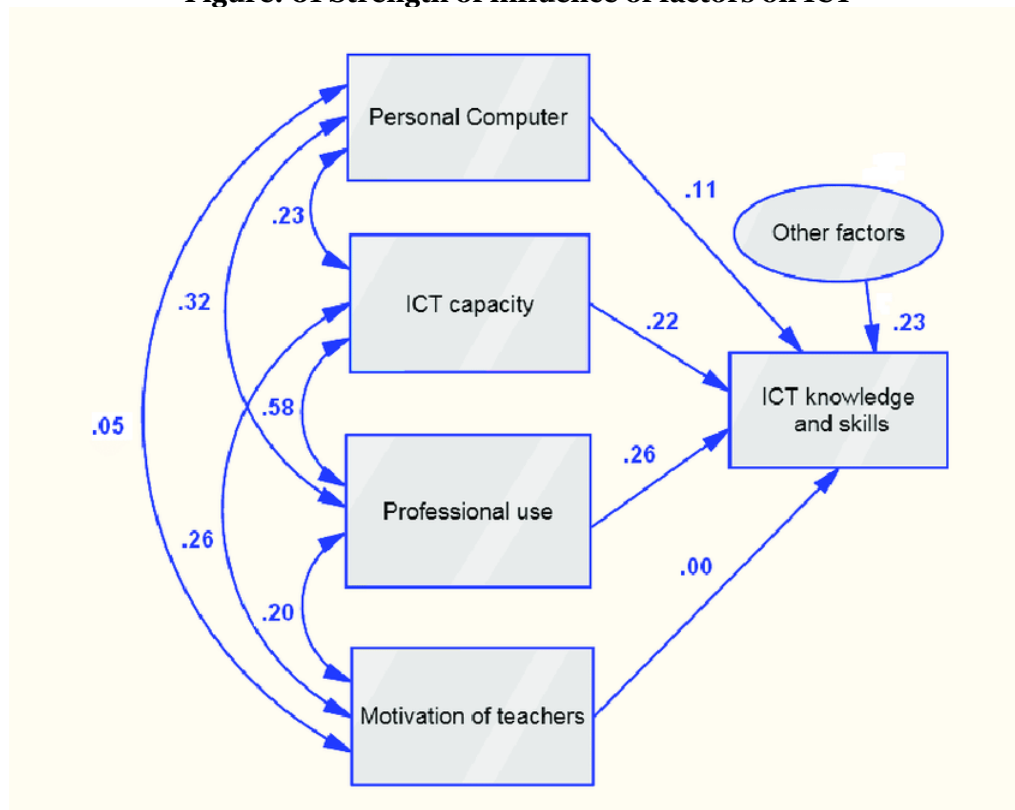
Source: www.google.com/url?sa=i&url

Paradigm Shift: The New Promise of Information Technology

Don Tapscott and Art Caston, (1993), explored the transformative potential of information technology (IT) and its impact on business, society, and the economy. The book delves into the concept of a paradigm shift brought about by IT, which fundamentally alters the way individuals and organizations interact, communicate, and conduct business. Tapscott and Caston (1993) argued that the advent of IT represents a seismic shift in how information is produced, disseminated, and consumed. Through case studies and examples, the authors illustrate how IT enables organizations to streamline operations, improve efficiency, and create new business models. The key themes of the book is the democratizing effect of IT, as it empowers individuals and small businesses to access information, collaborate, and compete on a global scale. The authors explore the rise of networked organizations, virtual communities, and digital marketplaces, highlighting the opportunities for innovation and entrepreneurship in the digital age. Tapscott and Caston (1993) discussed the implications of IT for organizational structure, management practices, and employee empowerment. They argue that traditional hierarchical structures are giving way to more decentralized, networked forms of organization, characterized by flatter hierarchies, greater autonomy, and collaboration across geographies and functions. The book examined the impact of IT on education, healthcare, government, and other sectors, exploring how digital technologies are reshaping service delivery, governance, and public participation. The book serves as a roadmap for individuals and organizations seeking to harness the promise of IT to drive positive change and unlock new opportunities in an increasingly digital world.

Rise of the Network Society:

Sundeep Sahay and Chrisanthi (2003) [17] serves as an introduction to the special issue focusing on the role of Information and Communication Technologies (ICTs) in developing countries. The article provides an overview of the key themes and contributions of the special issue. They emphasize the need for research that examines the complex interactions between ICTs and development processes, taking into account the diverse contexts and realities of developing countries. The objectives of the special issue, which include exploring the role of ICTs in sectors such as education, healthcare, governance, and entrepreneurship, as well as examining the socio-economic implications of ICT adoption and use in developing countries. They stress the importance of interdisciplinary perspectives and methodological approaches that combine insights from both ICT and development studies. Sahay and Avgerou [17] provide an overview of the articles included in the special issue, highlighting their contributions to advancing knowledge and understanding in the field of ICTs and development. They discuss topics such as the impact of ICTs on education and learning outcomes, the role of ICTs in healthcare delivery and disease management, the use of ICTs for e-government initiatives and public service delivery, and the challenges and opportunities of ICT-enabled entrepreneurship in developing countries. The importance of context-specific research that considers the social, cultural, and institutional

factors shaping ICT adoption and use in developing countries. Sahay and Avgerou call for future research to adopt a nuanced and critical perspective, moving beyond simplistic narratives of ICTs as panaceas for development challenges. A comprehensive overview of the themes and contributions of the special issue on ICTs in developing countries. It highlights the importance of research that examines the complex dynamics of ICT use and its implications for development outcomes, while also calling for a more context-sensitive and interdisciplinary approach to studying ICTs in the global south.

ICT Improving the Academic Exhibition

The utilization of Information and Communication Technologies (ICT) has significantly enhanced academic exhibitions, revolutionizing how knowledge is disseminated, shared, and experienced. This summary explores the profound impact of ICT on academic exhibitions, focusing on its role in improving accessibility, interactivity, and engagement. ICT has democratized access to academic exhibitions, transcending geographical and physical constraints. Virtual exhibitions hosted on online platforms allow individuals from around the world to access scholarly content and artifacts without the need for physical presence. This accessibility expands the audience base, reaching learners, researchers.

Figure: 02

Source: https://media.springernature.com
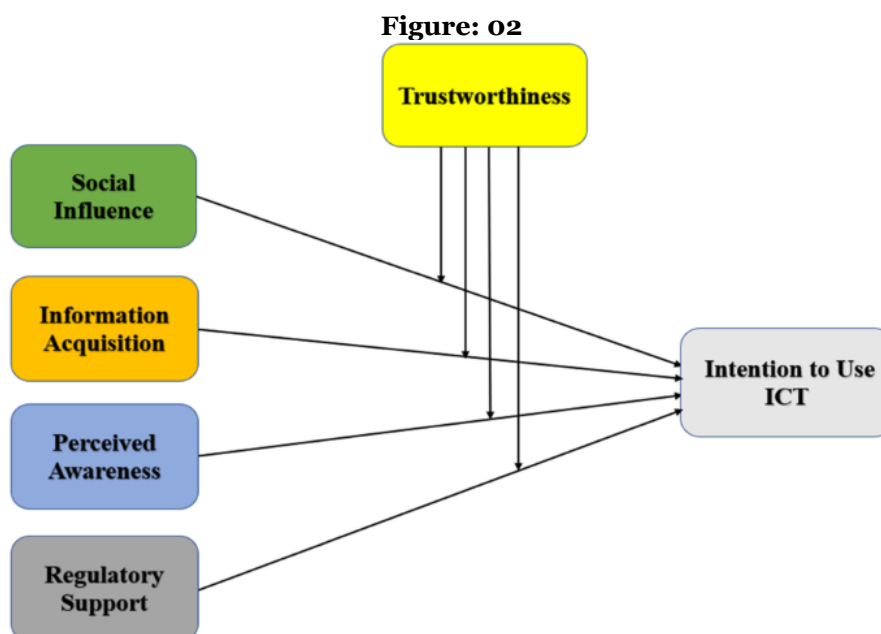
ICT enables enhanced interactivity and engagement within academic exhibitions. Interactive multimedia elements, such as virtual reality (VR) simulations, augmented reality (AR) experiences, and touch screen displays, offer visitors immersive and dynamic ways to explore and interact with exhibition content. These technologies facilitate deeper learning experiences by allowing users to engage with artifacts, simulations, and multimedia presentations in a personalized and interactive manner. ICT has revolutionized academic exhibitions, transforming them into accessible, interactive, and engaging learning environments. By leveraging digital technologies, academic institutions, museums, and cultural organizations can expand the reach and impact of their exhibitions, creating meaningful learning experiences that inspire curiosity, creativity, and lifelong learning.

Findings, Presentation and Results

ICT facilitates collaboration and knowledge sharing among exhibitors, researchers, and attendees. Online platforms and social media channels provide avenues for exhibitors to share information, exchange ideas, and collaborate on exhibition projects before, during, and after the event. Virtual networking features, such as live chat forums and video conferencing, enable participants to connect with peers, experts, and industry professionals, fostering interdisciplinary dialogue and collaboration.

1. Educational level

The impact of educational levels on the dissemination of technical knowledge through Information and Communication Technologies (ICTs) is profound. Higher levels of education often correlate with greater access to and proficiency in utilizing ICT tools and platforms. Individuals with advanced education are more likely to leverage digital resources such as online courses, scholarly databases, and collaborative platforms to acquire and disseminate technical knowledge.

Table 01 Educational level and level of awareness

Educational level	Awareness level			Total
	Less	Moderate	High	
Under Graduation	31	51	34	116
	26.7%	44.0%	29.3%	100.0%
Post-Graduation	35	47	29	111
	31.5%	42.3%	26.1%	100.0%
Professional	2	3	1	6
	33.3%	50.0%	16.7%	100.0%
Diploma	5	7	5	17
	29.4%	41.2%	29.4%	100.0%
Total	73	108	69	250
	29.2%	43.2%	27.6%	100.0%

The most of the respondents from Diploma (59.3%), are highly aware 50.0% of the Professional and 50.0% of the diploma holders are moderately aware. Significance of the relationship is tested as below. ICT enhances the presentation of academic exhibitions, enabling curators to create dynamic and immersive experiences that cater to diverse learning preferences and interests.

Table 02 Chi-square test

Chi-Square	df	CC	Sig.
63.014	8	0.297	0.000

The Chi-Square value (63.014) for the degree of freedom 8 is significant at 1% level. The CC value is 0.297. Hence, the framed null hypothesis is not valid. Moreover, they tend to possess stronger digital literacy skills, enabling them to critically evaluate information and contribute meaningfully to online discussions and communities focused on technical subjects. Additionally, higher education fosters a culture of lifelong learning, prompting individuals to continuously seek out and engage with emerging technologies and knowledge domains facilitated by ICTs. As a result, educational levels play a crucial role in shaping the dynamics of knowledge dissemination and utilization within the digital landscape, ultimately driving innovation and progress in various technical fields.

Factors influencing ICT in the Spread of Technical Knowledge paragraph

Higher educational levels often correlate with better access to ICT infrastructure such as computers, internet connectivity, and digital devices. Individuals with higher education are more likely to have access to these technologies, enabling them to leverage online resources, digital libraries, and educational platforms for acquiring technical knowledge. Higher levels of education generally result in greater digital literacy, facilitating the efficient use of ICTs for accessing, interpreting, and disseminating technical knowledge

Table 03 Factors and Level of awareness

Factors	Awareness level			Total
	Less	Moderate	High	
Access to ICTs	26	33	19	78
	33.3%	42.3%	24.4%	100.0%
Digital Literacy	11	28	20	59
	18.6%	47.5%	33.9%	100.0%
Online Resources	26	26	12	64
	40.6%	40.6%	18.8%	100.0%
Technical knowledge	4	1	0	5
	80.0%	20.0%	0.0%	100.0%
Virtual collaboration	2	14	12	28
	7.1%	50.0%	42.9%	100.0%
Collaborative Learning	4	6	6	16
	25.0%	37.5%	37.5%	100.0%
Total	73	108	69	250
	29.2%	43.2%	27.6%	100.0%

The most of the respondents (42.5%) working in some organizations, 39.3% of the professionals, 100.0% of the respondents from other categories are highly aware about the amenities. Most of the respondents (43.1%) of the respondents from the category of the students are less aware about the amenities available in the

Indian Railway. Most of the respondents from the business (34.3%) and housewives (72.9%) are moderately aware. The relationship is tested as below.

Table 04 Chi-Square test

Chi-Square value	df	CC	Sig.
88.695	10	0.370	0.000

The result from the above table shows a significant relationship at 1% level. The calculated value (88.695) for the degree of freedom 10 is significant. The value of CC is 0.370 which is more than 0.100. Hence the hypothesis is not true. It is concluded that employees, professionals and the respondents from other category are highly aware and the students are less aware. Educated individuals are more likely to actively seek out and utilize online resources for learning and professional development. Webinars, online tutorials, and academic databases, can access technical knowledge relevant to their field of study or profession.

Information and Communication Technologies

Higher educational levels often correspond with enhanced collaboration skills and the ability to engage in knowledge-sharing networks. Educated individuals can leverage ICTs for collaborative learning experiences, participating in online forums, discussion groups, and virtual communities where technical knowledge is exchanged, debated, and refined.

Table 05 Information and Communication Technologies: Descriptive Statistics (N-250)

Functions	Mean	Std. Deviation
Access	3.1054	0.61754
Collaboration	3.3257	0.78941
Disruption	3.1785	0.75472
Dissemination	3.0971	0.89327
Education	3.4510	0.74581
Empowerment	3.3782	0.73321
Innovation	3.3246	0.67202
Networking	3.9353	0.70045
Economic development	3.8258	0.86876
Research	3.7854	0.82344

The Table 5 indicates that the mean of Information and Communication Technologies is high towards networking (Mean-3.9353). Problem solving is the second biggest problem (Mean-3.8258). The standard deviation of the opinion of the respondents towards Dissemination is higher (0.89327). It shows that the opinion of the respondents about the ICT shows high difference.

Conclusion

The strategic use of ICTs has transformed the spread of technical knowledge, empowering individuals, organizations, and societies to overcome traditional barriers and accelerate learning, innovation, and economic development. By leveraging ICTs effectively, stakeholders can harness the power of information exchange to address global challenges, drive sustainable development, and create a more inclusive and prosperous future for all. ICTs also serve as catalysts for economic development by enabling entrepreneurship, job creation, and the emergence of knowledge-based economies. Digital entrepreneurship platforms, crowd funding platforms, and e-commerce platforms empower entrepreneurs to launch and scale innovative ventures, access global markets, and create jobs. Moreover, ICTs facilitate the dissemination of technical know-how and best practices to small and medium-sized enterprises (SMEs) through online training programs, business incubators, and technology transfer initiatives, enhancing their competitiveness and productivity. Agbor and Warri (2017) explored how the integration of ICTs in educational institutions influences teaching and learning outcomes, student engagement, and overall educational quality. The findings of the study could contribute to discussions on policy formulation, curriculum design, and resource allocation strategies aimed at enhancing the educational effectiveness of colleges of education through the strategic integration of ICTs.

Reference

1. Alruwais, G. Wills, and M. Wald, −Advantages and Challenges of Using e-Assessment, International Journal of Information and Education Technology, vol. 8, no. 1, pp. 34−37,2018.
2. Apagu Bala, −Availability and Utilization of ICT Facilities for Teaching and Learning of Vocational and Technical Education in Yobe State Technical Colleges," American Journal of Engineering Research (AJER), vol. 04, no. 02, pp. 113−118, 2015.

3. Attewell, P. (1996). The diffusion of computer technologies: An international review. In P. Heeks (Ed.), Managing Information Technology in Developing Countries: Lessons from Case Studies (pp. 123-153). Macmillan Press.
4. Castells, M. (2000). The Rise of the Network Society: The Information Age: Economy, Society, and Culture (Vol. 1). Wiley-Blackwell.
5. Ezekiel, A. W. (2016). Interactivity as a criterion for media selection in distance education: Never Too far, 16: 5-9.
6. Laronde et al., ‒A Case Study Of The Integration Of Information And Communication Technology In A Northern Ontario First Nation Community High School: Challenges And Benefits,‖ Journal of International Education Research (JIER), vol. 13, no. 1, pp. 27–34, 2017
7. Lévy, P. (1997). Collective Intelligence: Mankind's Emerging World in Cyberspace. Basic Books.
8. Levy, S. (1984). Hackers: Heroes of the Computer Revolution. Doubleday.
9. Marina, ‒Information and Communication Technology (ICT) and Its Role in Educational Assessment," English Journal, vol. 3, no. 1, p. 23, 2016.
10. Markus, M. L. (1987). Toward a "critical mass" theory of interactive media: Universal access, interdependence and diffusion. Communication Research, 14(5), 491-511.
11. Moore, M. G. (2017). Distance education: A learner's system, lifelong learning, 12, (8)8-11.
12. Redecker and Johannessen, ‒Changing Assessment - Towards a New Assessment Paradigm Using ICT, European Journal of Education, vol. 48, no. 1, pp. 79–96, 2013.
13. Rogers, E. M. (2003). Diffusion of Innovations (5th ed.). Free Press.
14. Schumpeter, J. A. (1942). Capitalism, Socialism and Democracy. Harper & Brothers.
15. Stross, R. E. (1996). The Silicon Snake Oil: Second Thoughts on the Information Highway. Anchor Books.
16. Suleiman, Muhammad Muhammad Matinja,Zakari Idris Gupta, Jyoti Sani, Shitu Ukashatu,‒Role of ICT for Authentic Assessment in Higher Education,‖ Tathapi Journal UGC Care, vol. 19,no. 38, pp. 128–136, 2020
17. Sunday, ‒Effective Teaching with ICT in Nigerian Higher Institutions: a Solution To Graduate Unemployability.," Journal of Educational Review, vol. 8, no. 3, pp. 231–239, 2015.
18. Sundeep Sahay &Chrisanthi Avgerou (2003) Introducing the Special Issue on Information and Communication Technologies in Developing Countries pp. 73-76
19. Tait, A. (2018), ‒Open Universities: the next phase‖, Asian Association of Open Universities Journal, Vol. 13 No. 1, pp. 13-23
20. Tapscott, D., & Caston, A. (1993). Paradigm Shift: The New Promise of Information Technology. McGraw-Hill.
21. Taylor (2015). Distance education technologies: The fourth generation. Australian Journal Educational technology, 11 (2), 1-7.
22. Toyo, ‒Information and Communication Technology (ICT) Adoption and the Educational Growth of Colleges of Education in Agbor and Warri, Delta State , Nigeria," International Journal of Education and Evaluation, vol. 3, no. 7,pp. 19–32 , 2017.
23. Webster, F. (2002). Theories of the Information Society (2nd ed.). Routledge.