Zakariya Journal of Education, Humanities & Social Sciences (ZJEHSS)

ISSN Print: 3008-1556
ISSN Online: 3008-1564
Volume 3, Number 1, 2025, Pages 42 – 55
Journal Home Page
https://journals.airsd.org/index.php/zjehss/index

An Approach to Understanding the Impact of Information and Communication Technology (ICT) On E-Learning through the Lens of Expectations and Disconfirmation

Dr. Rani Siti Fitriani SS M Hum[1] & Dr. S.R. Rajkumar[2]

[1]*Associate Professor, National Indonesian Language & Literature Education, Pasundan University Bandung Indonesia, Email: ranisitifitriani19@gmail.com*
[2]*Head & Librarian, Rev.Fr.E.J. Thomas. SJ.Libarary & Information Centre, St. Joseph's College, Pilathara, Kannur University, Kerala, India, Email: dhamburjpm@gmail.com*

ARTICLE INFO

Article History:

Received:	*March*	*15, 2025*
Revised:	*April*	*30, 2025*
Accepted:	*May*	*16, 2025*
Available Online:	*May*	*25, 2025*

Keywords:

Information and Communication Technology (ICT)-E-learning-Expectation-Disconfirmation Theory (EDT)-Learner Expectations-Disconfirmation-Student Satisfaction-Digital Learning Platforms-Technology Acceptance-Educational Technology-Online Learning Experience-User Perception-ICT Integration in Education-Learning Engagement-Technology Quality-Educational Innovation

ABSTRACT

The integration of information and communications technology (ICT) into education has revolutionized the e-learning landscape, offering new opportunities for interactive and flexible learning experiences. However, the effectiveness and acceptance of ICT control e-learning is influenced by learners' expectations and the extent to which experience of these expectations agrees. This study uses Expectation Theory (EDT) to analyze the effects of ICT on eLearning, focusing on how learners' favorable expectations affect their satisfaction and their coping with digital learning platforms. This paper examines how fulfillment or separation of these expectations, such as user-friendly, content quality, technical reliability, and user support, affects students' perceptions of e-learning systems. By examining the gap between expected and actual experiences, this study highlights the role of disruption in confirming learner satisfaction, learner motivation, and the continued use of ICT-enabled teaching instruments. Positive conversations (actual experience exceeds expectations) tend to increase satisfaction, while negative interruptions (if expectations are not met) can lead to frustration and can be resolved. This study provides valuable insight into educators, teachers and political decision-making. It is intended to optimize the use of ICT in educational settings. Understanding the dynamics of expectations and disruptions can help improve our e-learning platform by being more closely aligned with learners' needs and preferences. The results highlight how important it is to manage expectations and continually evaluate the user experience to ensure the success and sustainability of an ICT-enabled learning environment.

Corresponding Author's Email: ranisitifitriani19@gmail.com

Introduction

The rapid development of information and communications technology (ICT) has significantly changed the educational environment (Xia, 2020), particularly in the field of e-learning. As educational institutions and organizations are increasingly taking over digital platforms, ICT has become a central tool to improve learning experiences, providing students with access to resources, interactions and flexibility that traditional environments have not achieved before. However, the effectiveness and perceptual value of ICT in e-learning is shaped by a variety of factors, including learner expectations and whether these expectations are met during the learning process (Abdullah, 2020).

Expectation Theory (EDT) was spread across marketing and service quality studies to assess how customer expectations influence satisfaction with products and services. In the context of eLearning, this framework can provide valuable insight into student initial maintenance regarding ICT-enabled learning environments that influence perceptions of effectiveness. If student experience meets expectations, positive outcomes such as satisfaction, commitment, and academic success are more likely. Conversely, interruptions can lead to frustration, solutions (Wu, 2021) or complaints if the experience is no longer due to expectations.

This analysis attempts to examine the relationship between ICT use in e-learning environments and the expectations learners bring to these platforms. It is to examine how expectations of technology possibilities, such as user friendliness, interactivity, accessibility, and support, affect general satisfaction and the quality of perceived learning experiences. Furthermore, we examine the role of separation (the gap between expectations and actual experience) (Nguyen, 2022) and how this affects learners' attitudes towards e-learning platforms.

As educational institutions are increasingly relying on digital technologies (Taeihagh, 2021) to provide education, understanding learner expectations and the demands of the effects of interruptions can help improve the design and implementation of e-learning environments. (Pierson, 2022). This approach not only contributes to a wider range of educational technology, but also provides educators, managers and political decision makers with actionable insights to improve the effectiveness of e-learning platforms.

Through this separation of expectations and separation, this article examines key factors that influence learners' experiences using eLearning ICT, analyzes the effects of fulfillment or violations, and provides recommendations for improving the eLearning system based on these findings.[Terzi, S. (2020).]

Objectives

The purpose of this study is to examine the effects of ICT on eLearning by focusing on general satisfaction, commitment, general satisfaction, commitment, and differences in anticipation and actual experience on the continued use of ICT-enabled learning platforms for ongoing use of ICT-enabled learning platforms. In particular, the research is as follows:

- To examine the role of learners' expectations
- To explore the concept of disconfirmation in e-learning
- To assess the relationship between expectation fulfillment and learner satisfaction
- To identify factors influencing learners' expectations
- To evaluate the impact of ICT features on learning outcomes

- To provide recommendations for improving ICT-based e-learning platforms
- To contribute to the broader field of educational technology

Review of the Literature

Expectations are related to beliefs or expectations that learners maintain through the e-learning system before use. These expectations can be attributed to a variety of sources, including previous technology experiences, word of mouth, advertising, and institutional recommendations. According to Pearce (2021) expectations influence the way people perceive and interpret experiences, which affect their satisfaction. In the e-learning context, students often expect certain characteristics such as ease of use, high quality content, interactivity, and responsibility.

Several studies have shown that learners' expectations have a significant impact on satisfaction with e-learning platforms. For example, Udoka et al. (2021) found that learner expectations related to the functionality and simple use of e-learning systems affect technology settings and satisfaction. Alias et al. (2022) demonstrated that positive costs associated with perceived use of platform use promote learning to engage in materials and continue using the system. Mudau (2022) found that the e-learning platform discovered a positive shortage of shaping learner expectations. It is affected by the degree to which learners' expectations are met. Alwaely (2023) emphasized that learners' satisfaction to promote commitment is inherently important, as there are likely to be satisfied learners and have full e-learning courses. Meanwhile, Kumhar (2021) highlighted that complaints often arise from negative distances can lead to dropout rates of online education. Claudia Nerdel. (2023) found that perceptions of e-learning quality, characterized by expectations and practical experience, are positively correlated with learning outcomes. Positive entertainment that exceeds students' expectations leads to increased motivation, increased academic performance, and increased motivation to participate in future learning activities.

The literature suggests that learners' expectations and the resulting disconfirmation play a significant role in determining the success of ICT-driven e-learning systems. By applying the Expectation-Disconfirmation Theory, it is possible to gain a deeper understanding of the factors that shape learners' experiences and satisfaction with e-learning platforms. As the role of ICT in education (Simon, 2020) continues to grow, understanding and managing expectations will be crucial for enhancing the effectiveness of e-learning systems and ensuring their widespread adoption and success.

The Role of Learners' Expectations in E-Learning

Learners' expectations play a key role in designing their experiences, their commitment, and satisfaction with the e-learning platform. Expectations are related to preferred ideas and beliefs to learn learners before they learn them through educational systems and learning experiences, and before they treat them. These expectations are influenced by a variety of factors, including previous experiences of technology, institutional reputation, peer recommendations, marketing messages, and personal preferences. Understanding the role of learner expectations is essential for designing, implementing and improving e-learning systems. These expectations can have a significant impact on learners' perceptions and interactions with the digital learning environment (Wigfield, 2020).

Expectations affect how learners perceive the value and effectiveness of e-learning systems. For example, if learners are friendly to the platform being a user and expect simple navigation and an intuitive interface, then if these expectations are met, they will likely be

proactive in perceived the system. Conversely, learners can expect complex and difficult to use platforms (Esposito, 2023). It can be frustrating if their expectations are not met. Satisfaction is generally high if learners' expectations are met or exceeded. Negative entertainment (if expectations are not met) on the other hand can lead to frustration, separation, and even abandonment of the platform. Conversely, if the experience is due to expectations (negative entertainment), dissatisfaction arises.

Learners expect to use e-learning systems to achieve advanced academic success, they are more likely to use their efforts to use resources that provide maximum potential. On the contrary, if learners expect the learning platform to be ineffective or ineffective, they may not invest the time and energy needed for their coursework, which could result in lower results. Impact on the adoption of technology.

Learners' expectations also affect their willingness to continue to carry it through in education. As explained in the Technology Acceptance Model (TAM), (Cox, 2023). perceived user-friendly and perceived utility is an important component of learner expectations. If learners expect the technology to work easily and to gain an advantage in learning, they are more likely to take over the platform. In contrast, if learners expect high levels of technical difficulties or poor performance, they can be opposed overall. This may affect the overall effectiveness of ICT-based systems.

The direction between learner expectations and learning institution goals also plays a role in the effectiveness of the e-learning system. Institutions must ensure that the promises submitted in marketing materials or course descriptions are consistent with the actual experience of the platform. False things can lead to disillusionment and lack of trust with the system, which ultimately affects retention. Managing the expectations of e-learning systems

It is important to effectively manage learner expectations in order to improve the effectiveness of e-learning platforms. Institutions and platform designers can achieve this by clearly communicating the skills and limitations of the system (Virginia, 2021) providing realistic views, and providing ongoing feedback during the learning process. Setting learner expectations with real system functions can prevent negative interruptions and improve the general learning experience.

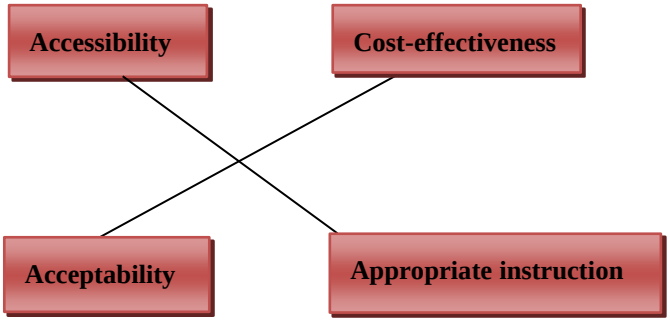
The role of learners' expectations in e-learning is multifaceted and plays a significant role in determining satisfaction, engagement, and learning outcomes. By understanding and managing these expectations, educational institutions and developers can design e-learning platforms that not only meet learners' needs but also exceed their expectations, fostering a more successful and satisfying learning experience. Through careful management of expectations and continuous feedback, institutions can enhance the adoption of ICT tools in education, ultimately improving learning outcomes and student retention.

ICT in Distance Education Learning

ICTs are powerful tools for expansion in both academic and non-academic fields. ICTs also provide easy access to experts, consumers, researchers, professionals, mentors, business leaders and colleagues around the world (Dabbagh, 2023). For developing countries, ICTs have the potential to increase access to education and improve its impact and quality. ICT stands for Information and Communication Technology and in this introduction it refers to "the wide range of technological tools and resources used for creating, publishing, storing and managing communication and information" (Owushi, 2023). These technologies include computers, the internet, media technology (radio, television) and telephones. This will

include all forms of educational technology such as print, audio, video and computers. The use of computers in open distance education provides new teaching strategies for distance education and greater freedom for distance learners. Technology has become part of our lives in schools, homes and workplaces. Modern technologies (Afouneh, 2021) used in open and distance learning include telephone teaching, teleconferencing, audio graphics, video conferencing, computer conferencing exercises, fibre optics, teletext and video text, multimedia and hypermedia CAI, e-books, the Internet, the World Wide Web (WWW) or the "information superhighway" online databases, online discussions, on-demand courses via telephone, satellite, television and other things. All of these techniques deserve a place in the teacher's knowledge. The emergence of multigenerational distance learning provides a valuable foundation for organizing the knowledge base.

Technology is little more than a simple tool (Aithal, 2023) and the communication of essential information and curriculum to students is important regardless of its delivery. In our experience, technologies that can be integrated into distance education should consider the following:



New technologies have facilitated the development of a new generation of distance education using voicemail, e-mail, telephone chat, and computer-based communication, as well as telecommunications and multimedia technologies. He hopes that these new technologies will facilitate interaction between teachers and students and create interactive learning packages (Graham, 2023) for use in a virtual environment. This will be beneficial for distance education students who can study anytime, anywhere.

The Relationship Between Expectation Fulfillment and Learner Satisfaction in E-Learning

The relationship between learner expectations and learner satisfaction is a fundamental concept for learning to understand how learners cope with e-learning platforms and ICT-based education. This relationship is closely related to technology experiences and learners' perceptions of educational processes. Learners come to the eLearning environment with many expectations based on previous experience, marketing messages, or word of mouth. If these expectations are met or exceeded, this can greatly improve your satisfaction, commitment and overall success. Conversely, unexpected expectations can lead to reduced dissatisfaction, motivation and solutions.

Expectations as a Predictor of Satisfaction (Hawarna, 2023)

Learners' expectations serve as a baseline based on the evaluation of their actual experience. According to the Expectation Discovery Theory (EDT), satisfaction is influenced by the degree of fulfillment (or incomplete) expectations. If learners' expectations are met or exceeded, they are positive interruptions, leading to greater satisfaction. However, if expectations are not met, negative aversion occurs, leading to dissatisfaction system.

The effect of positive interruptions on learner satisfaction

If learners' expectations are exceeded, they have a positive interruption. This leads to some beneficial outcomes for e-learning platforms.

Increased commitment: Learners who believe their expectations are exceeded will likely deal closely with content, actively participate in discussions, and assert tasks and tasks.

Negative Disconfirmation and impact on satisfaction

On the other hand, if learners' expectations are not met, there is a negative disruption, which leads to negative emotional responses and reduced satisfaction. The effects of uncovered expectations are serious and can have different effects on different aspects of learner commitment and behavior:

Frustration and motivation: Negative interruptions can lead to frustration as the system feels that it does not meet its own needs. This frustration can reduce your motivation, address content and reduce persistence. As a traditional classroom setting or other e-learning tool (Jha, 2023).

Example: If you enter an online course where learners expect feedback at a good time, but are late in answering or have no interaction with the trainer, you may be unhappy with the learning experience.

The role of expectation-oriented in order to have a positive effect on satisfaction. There is a clear orientation between what learners expect and what the platform offers. The design of e-learning systems should strive to ensure that learners' expectations are realistic and accessible, and be transparent about course requirements, platform capabilities, and expected outcomes. If expectations are realistically determined, the likelihood of a positive disruption increases. Transparent communication also helps prevent negative interruptions by addressing potential challenges ahead of time.

Influence of Expectation Fulfillment on Long-Term Learning Outcomes

Performance of expectations not only affects immediate satisfaction, but also has a long-term impact on learners' academic success and ongoing engagement with e-learning platforms. Your positive experiences lead to continuous interaction and active participation, which improves learning outcomes. This continuous use can lead to improved learning and outcomes.

Managing Expectations for Optimal Satisfaction

Effective management of expectations is important for learners to experience it in line with their own expectations. Educational institutions can use a variety of strategies to manage learner expectations.

On boarding and orientation: helps (Mediavilla, 2021) learners to set realistic expectations for the platform's capabilities and learning goals.

Course Design: Design an e-learning course that is interactive, dedicated and satisfying the needs of its learners.

Conclusion

The relationship between achievement of learners' expectations and satisfaction is an essential factor in the success of e-learning systems. Positive entertainment that exceeds learners' expectations improves satisfaction, commitment, and learning outcomes, while negative entertainment can lead to complaints and removal. Managing learner expectations with clear communication, realistic objectives, and fast support systems of responses is essential for optimizing satisfaction and ensuring further involvement with e-learning platforms. Orientation between learner expectations and actual experiences of the e-learning system is key to promoting an environment in which learners are thriving and successful.

The Impact of ICT Features on Learning Outcomes

The integration of information and communication technology (ICT) in educational environments has changed traditional methods of teaching and learning. ICT features such as multimedia tools, interactive platforms, real-time feedback systems, and digital content have been shown to have a significant impact on learning outcomes. With effective use, these traits can improve student commitment, promote personalized learning, and ultimately improve both academic achievement and retention (Claudia Nerdel, 2023).

Multimedia Tools (Text, Audio, Video, Interactive Content)

One of the most important features of ICT is the possibility to include multimedia elements (Text, Audio, Video, Image, Animation) in the learning process. These multimedia tools improve learning by creating a variety of learning styles (visual, auditory and kinesthetic) and making content more engaging. This is particularly effective for topics such as science, mathematics, and language learning. Mayer's cognitive theory of multimedia learning shows that learners will keep information better in contrast to just one when exposed to both visual and surveillance stimuli.

Interactive Learning Platforms

Interactive platforms such as learning management systems (LMS), gaming learning tools, and online testing allow students to actively deal with material instead of receiving passive information. These platforms often include features such as immediate feedback, discussion forums, and collaborative tools to support active learning. Active learning was associated with improved critical thinking and problem-solving skills as students were on learning trips. This quick feedback loop helps to correct misconceptions and enhance learning (Mulimani, 2019).

Example: Platforms like Kahoot! And Quizlet offers gaming ratings that allow students to compete with their colleagues and pursue progress over time. This motivates students to continue committing and improve their performance.

Personalized Learning

ICT functions (ITS) such as adaptive learning systems and intelligent tutoring systems enable personalized learning experiences. These systems can assess learners' current levels of competence, identify knowledge gaps, and adapt content or learning paths accordingly (Alwaely, 2023). For example, if students must address a particular topic, the system will provide additional practices or explanations tailored to their needs. They have difficulties based on the performance of individual learners, provide immediate feedback and optimize learning outcomes for each student.

Collaboration and Social Learning Features

ICT platforms often include tools that promote collaboration between learners. B. Discussion forum, group projects, and joint document processing. These collaborative features allow students to learn from each other, exchange resources, and solve problems. This will improve understanding, improve team skills, and enable learners to achieve a variety of perspectives. Social learning is especially valuable in topics that require brainstorming, peer review and real-time feedback.

Flexible Learning Environment

An ICT-based learning environment provides students with learning flexibility anytime, anywhere, and further strengthens their learning plans (Baharuddin, 2022). This flexibility is especially important for non-traditional learners, such as workers and students with busy schedules. Quickly go through topics and areas you already understand. Through multimedia tools, interactive platforms, personalized learning, collaboration options, real-time assessments and global access to know, you're learning experience will change, making it more engaging, accessible and effective. Integrating these ICT characteristics into the education system can lead to improved academic achievement, higher commitment for learners, and better preparedness for real challenges. When ICT is designed and implemented effectively, it can revolutionize education and create a better, personalized learning experience for all learners.

Recommendations for Improving ICT-Based E-Learning Platforms

The rapid growth of ICT-based e-learning platforms will revolutionize education, providing learners with access to resources and opportunities for personalized learning. However, continuous improvement is required to ensure that these platforms are highly effective and sustainable in promoting quality formation. Below are some recommendations for improving your ICT-based e-learning platform:

Improved User Experience (UX) and Accessibility

Recommendations: Focus on improving the user interface (UI) and user experience (UX) to make the platform intuitive and accessible to all learners. This helps learners find the resources they need. How much - Contrast mode. This ensures the same access to educational content for everyone.

Providing personalized learning paths (Enimola, 2023)

Recommended: Implement adaptive learning techniques to meet individual learning needs and styles. This personalized approach helps learners deal with material at their own pace and optimize learning outcomes. This autonomy increases commitment and satisfaction.

Improve your communication and support system

Recommendations: Create clear and continuous communication between learners, trainers and managers. This reduces frustration and improves the general learning experience. A robust help forum will be a valuable resource for self-directed learning and support from the same age. This increases satisfaction and ensures learners do not stay without instructions.

Enhance Security and Privacy Features (Oyelude, 2021)

Recommendations: Prioritize personal data protection and learner intellectual property. Transparency in data protection guidelines builds trust in users. Support continuous improvement through user feedback

Recommended: Determine mechanisms to collect user feedback and notify you of future updates. Integrate your proposals to create iterative updates. needs.

Conclusion

Improving the ICT-based e-learning platform requires a holistic approach combining user-centered design, personalized learning, content, timely feedback and a robust support system. By implementing these recommendations, the e-learning platform can provide a more effective, engaging and supportive learning experience that leads to improved academic performance and learner satisfaction. With the continuous integration of innovative features and regular updates based on user feedback, these platforms can be customizable and relatable in a constantly evolving educational environment.

Contribution to the Broader Field of Educational Technology

In the field of education technology, exponential growth has been recorded over the past few decades, including mobile learning, where innovations such as e-learning platforms, virtual classrooms, adaptive learning systems, and mobile learning, are changing the educational environment. In particular, in relation to e-learning, the research and implementation of information and communication technology (ICT) in education not only influences the delivery of education, but also influences how learners and educators experience it.

Enhancing Access to Education (Paiko, 2021)

One of the most important contributions from ICT to educational technology is its ability to build geographical and socioeconomic obstacles and expand access to education around the world. This is particularly pronounced in the rise of large open online courses (MOOCS). This means that content can be accessed by learners from a different background than top universities and trainers. It facilitates lifelong learning by providing learners with the opportunity to continuously improve their skills at every stage of their career through flexible online learning options. This contributes to broader advances in creating a continuous, self-directed culture of learning.

Personalized Learning Experiences

Adaptive learning techniques and adventures in learning analysis have resulted in a change in unified education into a more personalized learning experience that meets the needs of individual learners. This leads to a more effective and tailor-made educational experience.

Promoting Active Learning and Engagement

ICT-enabled learning platforms innovate and promote interactive and engaging learning environments. This practical approach to learning improves student problem solutions and student critical thinking. This approach applies to language learning, but can be extended to other topics. This immersive experience is particularly useful in fields such as medicine, engineering, science and more.

Promotion of cooperation and social learning

The use of ICT tools promotes collaboration among learners, a central part of effective educational technology. These tools simulate traditional classroom collaborative learning experiences where students can work together to solve problems and exchange ideas. Students can discuss course materials, participate in group projects, and give each other feedback (Isaac Udoka, 2021).

Improving Teacher Effectiveness

ICT plays an important role in supporting educators, improving teaching methods and increasing productivity. Tools such as PowerPoint, Prezi, and Camtasia allow educators to create visually engaging, multimedia enhanced presentations that represent a variety of learning styles. The immediate feedback mechanism allows trainers to provide rapid insight into student performance and improve their learning process. MOOCs, webinars and virtual workshops allow educators to improve their skills in both technology and pedagogy and stay up to date with the latest apprenticeships and methods.

Enhancing Student Autonomy and Motivation

ICT allows learners to take on learning in relation to flexible schedules, self-adaptive learning, and a wide range of resources. This autonomy promotes deeper commitment and a more personalized learning experience. These tools create a sense of performance and awareness, promote essential motivation, and promote continuous progress.

Continuous innovation in educational practice (Ishak, 2022)

Educational technology is a constantly developed field with continuous innovation that can shape the future of learning. Further developments in AI and machine learning will increase the possibilities for even more intelligent and more recoilable education systems. This allows you to streamline your processes and recognize skills, achievements and qualifications in a safe and transparent way (Setianingsih, 2020). The flexibility and scalability of cloud computing allows institutions to provide learners with ongoing access to resources and support. It revolutionizes the way education is delivered, making it more accessible, flexible, committed and more personalized. ICT has used digital platforms, adaptive learning systems and multimedia tools to enable learners, support teachers, and improve educational outcomes. If new technology arises, the possibility of further innovation in the education sector remains high. The continued integration of technology into education promises to make learning more equitable, engaging and efficient, and to change the broader field of educational technology for the next few years.

Conclusion

The impact of information and communication technology (ICT) on e-learning is diverse and shapes the way learners provide, consume and interact with educational content. The lens of

expectation and interruption provides a unique perspective to assess these effects, as it considers the direction (or misorganization) between what learners of ICT-based e-learning platforms expect and their actual experience. Analysis of expectations that learners maintain in relation to technology, content, and support systems, as well as interruptions related to the extent that these expectations are met or not covered, play a critical role in assessing learners' satisfaction, commitment, and learning outcomes.

Expectations and Satisfaction

Learners enter an e-learning environment with positive expectations of user-friendly, interactivity and content quality. If your expectations are met or exceeded, your satisfaction will increase. This has a positive effect on motivation and commitment. Conversely, dissatisfaction leads to frustration and reduced learning outcomes when expectations are not met. Positive entertainment (if experience exceeds expectations) tends to increase trust and self-efficacy, which leads to better learning outcomes. On the other hand, negative interruptions (if experience is no longer expected) can interfere with the learning process and contribute to a solution.

ICT features and user experience: User-friendly features, an intuitive interface and seamless technology integration play a key role in designing learners' expectations. If these features work as expected, we will improve your general learning experience. However, technical issues, complex interfaces, or inadequate support structures often lead to negative disruptions and negatively affect learner satisfaction. E-learning platforms that integrate adaptive learning techniques such as AI-controlled recommendations and personalized feedback will exceed learners' expectations and reduce the gap between expected and actual performance. Platforms that promote rapid communication, peer collaboration and trainer feedback tend to create a more satisfying learning experience. A lack of appropriate support can lead to negative disruptions and hinder the learning process.

Technology Integration and Infrastructure

The role of technology infrastructure cannot be underestimated. Trusted access to the platform, high-speed internet, and proper device compatibility are fundamentally important to get excited by learners' expectations. Confusion in these areas can significantly reduce the general learning experience and cause negative disruptions.

Future Considerations

Regarding the future, the ongoing development of ICT tools and learning techniques will further impact the future of e-learning. When artificial intelligence, machine learning and virtual reality are integrated through e-learning platforms, learners' expectations continue to increase. It is important for developers to maintain these expectations and provide innovative and adaptive technologies that create engaging, personalized, accessible learning experiences.

In summary, it can be said that the investigation of expectations and separation provides valuable insight into the dynamics between learners and e-learning platforms. By understanding and fighting the factors that influence these perceptions, institutions and technology developers can contribute to the broader goal of improving e-learning effectiveness, improving learner satisfaction, and creating an integrated and engaging educational experience for everyone.

References

1. Achuonye, K. A., & Diseph, E. (2021). Availability of E-Learning Facilities for Effective Instructional Process in Tertiary Institutions, Rivers State. International Journal of Innovative Education Research, 9, 48-56
2. Aithal, P. S., & Aithal, S. (2023). Predictive Analysis on Future Impact of Ubiquitous Education Technology in Higher Education and Research. International Journal of Applied Engineering and Management Letters (IJAEML), 7, 88-108.
3. Berte, D. Z., Mahamid, F. A., & Afouneh, S. (2021). Internet addiction and perceived self-efcacy among university students. International Journal of Mental Health and Addiction, 19, 162–176.
4. Bassey, M. M., & Owushi, E. (2023). Adoption of Artificial Intelligence in Library and Information Science in the 21st Century: Assessing the Perceived Impacts and Challenges by Librarians in Akwa Ibom and Rivers States. International Journal of Current Innovations in Education, 6(1), 75-85.
5. Cox, A. (2023). How artificial intelligence might change academic library work: Applying the competencies literature and the theory of the professions. Journal of the Association for Information Science and Technology, 74(3), 367-380.
6. Centobelli, P., Cerchione, R., & Esposito, E. (2023). Managing Knowledge through Knowledge Management Systems: Innovation vs Tradition. In F. Schupp, & H. Wohner (Eds.), Digitalisierung im Einkauf (pp. 27-44).
7. Dabbagh, N. (2023). The Pedagogical Ecology of Learning Technologies: A Learning Design Framework for Meaningful Online Learning. In A. Badran, E. Baydoun, S. Hillman, & J. Mesmar (Eds.), Higher Education in the Arab World: E-Learning and Distance Education (pp. 25-51). Springer Nature Switzerland
8. Dignum, Virginia.(2021). “The role and challenges of education for responsible AI.” London Review of Education 19 (1). https://doi.org/10.14324/LRE.19.1.01
9. Eccles, J. S., & Wigfield, A. (2020). From expectancy-value theory to situated expectancyvalue theory: A developmental, social cognitive, and sociocultural perspective on motivation. Contemporary Educational Psychology, 61, 101859. https://doi.org/10.1016/j.cedpsych.2020.101859
10. Estrellado, C. J. P., & Miranda, J. C. (2023). Artificial Intelligence in the Philippine Educational Context: Circumspection and Future Inquiries. International Journal of Scientific and Research Publications, 13(5), 16. ISSN 2250-3153.
11. Fu, Y. (2020). Research on the Development Trend of Online Education Industry Considering the Influence of Big Data and Artificial Intelligence. Advances in Intelligent Systems and Computing (Vol. 928, pp. 852–859).Springer Verlag.
12. Flosia Moses Simon, (2020). Volume 7, Issue 1, 132-137-July 2020’Role of Information Technology in Environment and Human Health’..
13. Graham, G. (2023). AI and Math Education: Exploring New Dimensions of Learning. https://www.futureschoolai.com/blog/aiand-math-education-exploring-new-dimensions-of-learning.
14. Gómez-Fernández, N., & Mediavilla, M. (2021). Exploring the relationship between Information and Communication Technologies (ICT) and academic performance: A multilevel analysis for Spain. Socio-Economic Planning Sciences, 77, 101009. https://doi.org/10.1016/j.seps.2021.101009
15. Hawarna, S. (2023). Using Artificial Intelligence and Other Frontier Technologies to Transform the E-Learning Industry. Journal of Namibian Studies: History Politics Culture, 35, 1663-1675.

16. Hornberger, Marie, Arne Bewersdorff, and Claudia Nerdel. (2023) "What Do University Students Know about Artificial Intelligence? Development and Validation of AI Literacy Test." Computers and Education: Artificial Intelligence 5 (January):100165. https://doi.org/10.1016/j.caeai.2023.100165.
17. Jha, S. K. (2023). Application of artificial intelligence in libraries and information centers services: prospects and challenges. Library hi tech news, 40(7), 1-5.
18. Kirmani, M. M., & Kumhar, S. H. (2021). Role of Information Communication Technology Tools in E-Learning Process. Ilkogretim Online, 20, 2144-2159.
19. Kotur, M. B., & Mulimani, M. N. (2019). Digital Library Resources for the Users: An Overview. Journal of Advancements in Library Sciences, 6(1 Special Issue), 111-114.
20. Lahiani, H., Aljarrah, H. Y., Alqudah, H., & Alwaely, S. A. (2023). Teachers' Perspectives on ICT Curriculum and Students' Learning Skills. Emerging Science Journal, 7, 32-39.
21. Lyu W, Liu J (2021) Artificial Intelligence and emerging digital technologies in the energy sector. Applied Energy 303(Dec): 117615.
22. Mohamed, M. Z. b., Hidayat, R., Suhaizi, N. N. b., Sabri, N. b. M.,Mahmud, M. K. H. b., & Baharuddin, S. N. b. (2022). Artificial intelligence in mathematics education: A systematic literature review. International Electronic Journal of Mathematics Education, 17(3), em0694.
23. Majola, M. X., & Mudau, P. K. (2022). Lecturers' Experiences of Administering Online Examinations at a South African Open Distance E-Learning University during the COVID-19 Pandemic. International Journal of Educational Methodology, 8, 275-283.
24. Nafiu, A. T., Orugun, J. J., & Enimola, D. J. (2023). Exploring ICT Adoption for Improved Efficiency of E-Learning in Higher Institutions of Kogi State. Facta Universitatis, Series: Teaching, Learning and Teacher Education, 7, 85-94.
25. Okunlaya RO, Abdullah NS, Alias RA (2022) Artificial intelligence (AI) library services innovative conceptual framework for the digital transformation of university education. Library Hi Tech 40(6): 1869–1892.
26. Oyelude, A. A. (2021). AI and libraries: trends and projections. Library Hi Tech News, 38(10), 1-4.
27. Owo, O. T., & Isaac Udoka, C. N. (2021). The Perception of Educational Stakeholders on Utilization of E-Learning Technology for Quality Instructional Delivery in Universities in Rivers State, Nigeria. Journal of Learning for Development, 8, 312-326.
28. Paiko, E. J. (2021). Accessing the Availabilities, Utilization and Attitude of Teachers in E-Learning Technologies for the Teaching and Learning of TVET Programmes in the North-West Nigeria. International Journal of Innovative Research and Development, 10, 128-135.
29. Pearce, G. (2021). Beware the Privacy Violations in Artificial Intelligence Applications. https://www.isaca.org/resources/newsand-trends/isaca-now-blog/2021/beware-the-privacy-violations-inartificial-intelligence-applications.
30. Qiu, Y., Pan, J., & Ishak, N. A. (2022). Effectiveness of Artificial Intelligence (AI) in Improving Pupils' Deep Learning in Primary School Mathematics Teaching in Fujian Province. Computational intelligence and neuroscience, 2022, 1362996.
31. Ramdani, A., Virgono, A., & Setianingsih, C. (2020). Food Detection with Image Processing Using Convolutional Neural Network (CNN) Method (pp. 91–96). Institute of Electrical and Electronics Engineers (IEEE).

32. Rocca, R., Rosa, P., Sassanelli, C., Fumagalli, L., & Terzi, S. (2020). Integrating virtual reality and digital twin in circular economy practices: A laboratory application case. Sustainability (Switzerland).
33. Singh, S., Singh, U. S., & Nermend, M. (2022). Decision Analysis of E-Learning in Bridging Digital Divide for Education Dissemination. Procedia Computer Science, 207, 1970-1980.
34. Tait, E., & Pierson, C. M. (2022). Artificial intelligence and robots in libraries: Opportunities in LIS curriculum for preparing the librarians of tomorrow. Journal of the Australian Library and Information Association, 71(3), 256-274.
35. Taeihagh, A. (2021). Governance of artificial intelligence. Policy and Society, 40(2), 137–157.
36. Vuong, Q. H., Le, T. T., & Nguyen, M. H. (2022). Mindsponge Mechanism: An Information Processing Conceptual Framework. In The Mindsponge and BMF Analytics for Innovative Thinking in Social Sciences and Humanities (pp. 21-46).
37. Weidener, Lukas, and Michael Fischer. 2024. "Artificial Intelligence in Medicine: Cross-Sectional Study Among Medical Students on Application, Education, and Ethical Aspects." JMIR Medical Education 10 (1): e51247.https://doi.org/10.2196/51247.
38. Wu, R. (2021). Visualization of basic mathematics teaching based on artificial intelligence. Journal of Physics: Conference Series, 1992(1), 042042.
39. Yufei, L., Saleh, S., Jiahui, H., & Abdullah, S. M. S. (2020). Review of the application of artificial intelligence in education. International Journal of Innovation, Creativity and Change, 12(8), 548–562.
40. Zhong, B., & Xia, L. (2020). A systematic review on exploring the potential of educational robotics in mathematics education. International Journal of Science and Mathematics Education,18(1), 79-101.