EXPLORING THE E-LEARNING SUPPORTING SYSTEMS FOR STUDENTS WITH SPECIAL NEEDS

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ABSTRACT

Objectives: This study provided a comprehensive exposition of an educational delivery service framework incorporating inclusive education for children with special needs. It is of the utmost importance to investigate the most efficient models that can be established to assist children who have special needs in becoming active members of the society. The field of e-learning has experienced significant expansion owing to the proliferation of a diverse range of technological tools and devices which enable users to access educational resources. Numerous educational support frameworks have been implemented to make the integration of learners with special needs into regular academic programs swifter.

Methodology: This study used the literature review as its methodology. The study gathered data from articles, books, videos and official circulations about the services and supporting systems used for students with special needs in Saudi Arabia. The study also relied on the descriptive approach to support the review by conducting interviews with school headmasters in 20 different schools. The interviews were content-analysed and reviewed to extract opinions on the models used in these schools.

Results and conclusion: Most of the interviewed participants agreed that the comprehensive quality model presents better opportunities for all students and teachers alike. The findings showed the availability of several models that educators can use to evaluate the e-learning supporting systems. The study benefits teachers and educators in understanding the e-learning supporting systems.

Keywords: Education System, E-learning, Inclusive Education, Special Needs.

EXPLORANDO OS SISTEMAS DE SUPORTE A E-LEARNING PARA ESTUDANTES COM NECESSIDADES ESPECIAIS

RESUMO

Objetivos: Este estudo forneceu uma exposição abrangente de um quadro de serviços educacionais incorporando educação inclusiva para crianças com necessidades especiais. É da maior importância investigar os modelos mais eficientes que podem ser estabelecidos para ajudar as crianças com necessidades especiais a tornarem-se membros ativos da sociedade. O campo do e-learning tem experimentado uma expansão significativa devido à proliferação de uma gama diversificada de ferramentas tecnológicas e dispositivos que permitem aos usuários acessar recursos educacionais. Foram implementados numerosos quadros de apoio educativo para tornar mais rápida a integração dos alunos com necessidades especiais em programas acadêmicos regulares.

Metodologia: Este estudo utilizou a revisão da literatura como sua metodologia. O estudo reuniu dados de artigos, livros, vídeos e circulações oficiais sobre os serviços e sistemas de apoio usados para estudantes com necessidades especiais na Arábia Saudita. O estudo também contou com a abordagem descritiva para apoiar a revisão, realizando...
entrevistas com diretores de escolas em 20 escolas diferentes. As entrevistas foram analisadas por conteúdo e revisadas para extrair opiniões sobre os modelos utilizados nessas escolas.

**Resultados e conclusão:** A maioria dos participantes entrevistados concordaram que o modelo de qualidade abrangente apresenta melhores oportunidades para todos os alunos e professores. Os resultados mostraram a disponibilidade de vários modelos que os educadores podem usar para avaliar os sistemas de suporte de e-learning. O estudo beneficia professores e educadores na compreensão dos sistemas de apoio ao e-learning.

**Palavras-chave:** Sistema Educacional, E-learning, Educação Inclusiva, Necessidades Especiais.

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1 INTRODUCTION

Recently, policies governing education have experienced notable modifications in relation to the models of support implemented. According to the conventional framework, the obligation of catering to the distinctive educational prerequisites of students or individuals has historically rested on either singular parties (e.g., special educators, teachers, assistants) or "external" authorities. In a contemporary perspective, while seeking external expertise remains an option, schools are encouraged to prioritize the utilization of internal resources and programs, underscored by collaborative efforts among the school's staff, prior to resorting to external assistance (Hoq, 2020). It is recommended that educational institutions at the local level establish cooperative networks for the purpose of resource sharing, collaborative problem-solving, and the cultivation of competencies, which can be readily accessed by both instructors and pupils. The provision of support has been significantly associated with the term "cooperation," as noted by Lunt et al. (1994) Due to their frequent intersection, distinguishing between the two is occasionally challenging. To systematically present the prevalent models, the systems elucidated in Human Ecology Theory were duly considered.

The growth of information technology (IT) has sparked advancements in multiple domains, including finance, commerce, healthcare, and education. The significant proliferation of education has consequently led to the widespread utilization of e-learning, an outcome directly attributed to the amalgamation of education and technology. This approach is acknowledged as an influential platform for acquiring knowledge and skills (Al-Fraihat et al., 2017). Electronic learning (e-learning) has established itself as a prevailing modality within the realm of academia and has been widely embraced within the landscape of postsecondary education. As per the research conducted by Dahlstrom et al. (2014), page number not specified. It has been revealed through empirical research that a staggering 99% of academic institutions currently possess Learning Management Systems (LMSs) as a structural element of their education policies. Further examination of these institutions showed that 85% of them have engaged with the aforementioned systems. Relatedly, in the United Kingdom, 95% of higher education establishments have integrated LMSs as a pivotal component facilitating their pedagogical provisions (McGill & Klobas, 2009).

Effectiveness and quality of the e-learning systems have garnered significant attention from scholars, leading to a multitude of research endeavors aimed at identifying factors that contribute to the success of these systems. For instance, Ali and Ahmad (2011), Fathema et al., (2015), and Islam (2013) have conducted studies pertaining to identifying success factors in e-learning systems. The goal of these endeavors has been to maximize the efficacy of e-learning systems. In a general sense, the majority of research conducted on the determinants of successful e-learning systems has focused on analyzing individual components, with a lack of
consideration for the potential synergistic effects that result from the interaction of success variables. An alternate avenue of inquiry has explored the immediate associations between quality determinants of e-learning and patterns of utilization or contentment (Eom & Ashill, 2018).

2 PROBLEM STATEMENT

Children with special needs are exposed to social exclusion and inadequate self-esteem when they are not afforded ample opportunities to interact with their peers from different groups of the same age. Adolescents are particularly susceptible to vulnerability because of a lack of adequate levels of affection, familiarity, and intellectual stimulation from their peers. This condition renders them more prone to adverse outcomes. Due to these prevailing circumstances, children with special needs face increased challenges in addressing their disabilities, hindering their ability to fully realize their potential as they age. Consequently, children endowed with specific requirements are progressively being inculcated with the notion of their limited potential to accomplish significant objectives for themselves or others.

It is very important to evaluate the supporting systems available for this category of students. In Saudi Arabia, there are specific models of supporting students with special needs and schools vary in their provisions of these systems. Therefore, it is of the utmost importance to investigate the most efficient models that can be established to assist children who have special needs in becoming active members of the society.

3 OBJECTIVE OF THE STUDY

The primary objective of this study is to provide a comprehensive exposition of an educational delivery service framework incorporating inclusive education for children with special needs. The proposed objective shall be attained by means of the literature review methodology and adherence to educational regulations. The study will answer the following question:

- What are the models used in the e-learning supporting systems for students with special needs in Saudi Arabia?

4 LITERATURE REVIEW

The field of e-learning has experienced significant expansion owing to the proliferation of a diverse range of technological tools and devices which enable users to access educational resources. These tools and devices include laptops, computers, smartphones, and tablets. The influence of technology on education and pedagogy has been significantly profound. Historically, the access to educational resources has been limited to a select group of individuals, as per conventional norms. The scope of collaboration and communication among students has thus far been confined to those situated within a singular classroom (Alnahdi & Schwab, 2021). Presently, an extensive array of educational materials, presented in diverse media such as text, images, audio, and video, can be accessed via the internet. This facilitates self-directed learning, while simultaneously enabling individuals to overcome geographical barriers. Furthermore, there has been an increase in the range of collaborative opportunities and interactive communication functionalities, inclusive of forums, chat platforms, and peer-to-peer activities. is a constant progression in the development of new products and services (Cooc, 2019).

Integrating students with disabilities into standard classroom settings should be implemented whenever it is deemed feasible, as this has the potential to promote active
engagement in academic pursuits for those with special needs. One approach to facilitating the social integration of individuals with diverse abilities is through the enrollment of said individuals in a mainstream educational setting, wherein they have the opportunity to learn alongside their typically developing peers and participate in communal activities in sync with their counterparts (Billingsley & Bettini, 2019). Moreover, children who have special needs can potentially derive significant advantages from structured educational programs, interventions, and enhanced support mechanisms that cater to their distinct requirements. Such initiatives can facilitate the acquisition and honing of essential social skills, which are critical for fostering meaningful and enduring social connections.

Children with special needs can potentially derive advantageous outcomes from cultivating their social relationships by engaging in extracurricular activities that are outside the traditional academic domain, including but not limited to participation in sports teams, music programs, or clubs (DeMink-Carthew & Olofson, 2020). This augments the frequency and variety of social interactions among peers within a comparable age cohort. Engaging in such activities affords children not only with the chance to acquaint themselves with unfamiliar individuals and form new social connections, but also enables them to acquire indispensable social competencies such as collaborative teamwork, effective self-expression, and effective troubleshooting (Bryant et al., 2019).

Numerous educational support frameworks have been implemented to make the integration of learners with special needs into regular academic programs swifter. Westwood (2002) posits that the dynamics of special educational support has undergone significant transformation. To illustrate the aforementioned change, Westwood proffers various paradigms concerning the matter, including clusters and networks, collaboration consultation framework, special education needs coordinators approach, pedagogical strategies within a classroom, and the resource room schema. Various forms of assistance can be offered to students within a classroom, including those which involve computer-assisted instruction or additional personnel (Billingsley & Bettini, 2019). These helping strategies have been implemented to aid students in their educational pursuits and provide them with important tools to achieve academic success. In educational settings, it is typical for the inclusion of an extra individual to take the form of another educator (such as a support teacher or a team teacher), a paraprofessional (such as a teachers' aide or paraprofessional staff member, parent, volunteer assistant, or college or university student), or a peer (through peer tutoring or cross-age tutoring).

In contemporary times, catalogues of specialized assistance programs have been formulated as a mechanism to delineate patterns of support extended to students with exceptional learning requirements in various counties. Such catalogues are retrievable from international databases. The present study considers various categories of support models, including but not limited to additional assistance provided by specialist educators, special approaches to teaching and materials, customized modifications to the textbooks, collaboration with non-educational institutions, special arrangements for assessment, reduction in class sizes, and alterations to the physical facilities of schools.

The pedagogical approach to instructing children with special needs is a multifaceted matter that is rife with divergent perspectives, with proponents of each arguing in favour of the superiority of their respective methodologies. The aforementioned concepts are those that are endorsed by a significant cohort of individuals. According to one perspective, the incorporation of children with special needs into regular educational programs to the fullest extent feasible is of utmost importance (Mahmut, 2020). This inclusive viewpoint emphasizes the significance of providing equitable opportunities for all students, regardless of their individual needs. Proponents of the inclusion movement posit that children with disabilities ought to be afforded the opportunity to enroll in typical academic institutions, as this measure has the potential to augment not only their academic performance, but also their social development. According to
the Least Restrictive Environment (LRE) theory, it is best for children with special needs to receive an education in the environment that is both as accommodating to their level of capability as well as the environment that imposes the fewest restrictions on them as is reasonably possible. The theory of least restrictive environment (LRE) proposes that children who have special needs should get an education in a setting that is adapted to fulfill the requirements that are unique to them (Hewett et al., 2017). This setting may not look like a traditional classroom.

As posited by the Universal Design for Learning (UDL) Hypothesis, it is imperative that all students, regardless of their individual requirements, are afforded the opportunity to benefit from an education of comparable quality. This stance is advocated by proponents of the UDL concept. De Oliveira et al. (2018) posit that the notion that every student should have access to a uniformly high standard of education is a prevailing concept. This assertion highlights the importance of integrating diverse forms of peer interaction, student representation, and individual expression within the confines of the classroom setting (Khasawneh, 2021).

5 PREVIOUS STUDIES

Almalki et al (2021) undertook an inquiry into the extent of parents’ involvement in the transition process of pupils with disability in Saudi Arabia. Additionally, challenges pertaining to parental responsibilities were deliberated. A survey instrument was employed to gather information from 91 educators specializing in special education. The findings revealed that parental involvement in the transition planning process was deficient for several underlying reasons, including an insufficiency of time and a dearth of knowledge regarding the intricacies of the transition process. Nonetheless, the research concluded that educational institutions were not sufficiently proactive in seeking parental involvement, and did not provide ample guidance on services to enable parents to make a significant contribution to the planning process.

Alnahdi et al (2019) compared the Saudi system and the Finnish systems for pre-service teachers with respect to attitudes toward inclusion in education. The results were subjected to five distinct statistical analyses for discernment and subsequent interpretation. Variations in the attitudes of pre-service teachers were identified among the samples. The statistical analysis revealed that the average score obtained by the Finnish participants on the Task Analysis Inventory Scale (TAIS) was closely proximate to the neutral central point. Conversely, the Saudi participants’ average score on the same scale was situated below the midpoint. Gender and educational background displayed noteworthy variations within the Saudi sample, whereas no such dissimilarities were observed within the Finnish sample. In conclusion, notable distinctions were identified in the attitudes pertaining to inclusive education between pre-service teachers from Saudi Arabia and Finland. The variations observed across nations pose intricate obstacles towards the creation of tools that are culturally unbiased, particularly in gauging the prevailing mindset towards inclusivity.

Alnahdi (2020) explored the level of self-efficacy that educators possess with regards to instructing students in inclusive learning environments. The research utilized a quantitative descriptive methodology. The results showed that educators demonstrated a high degree of self-assurance in their capacity to function effectively within inclusive educational environments. The instructors conveyed apprehensions pertaining to certain competencies that are essential in inclusive environments. The educators exhibited diminished assurance towards competencies such as engaging families in school-related events, enhancing knowledge about legislations and regulations pertaining to the integration of learners with disabilities, and managing situations involving physically aggressive pupils. Despite the existence of several challenges, educators demonstrated unwavering confidence in their aptitude to acquire the necessary skills requisite for effective instruction in inclusive learning environments.
Abed and Shackelford (2020) conducted an exploratory study was carried out to evaluate the educational support needs and opportunities for undergraduate and postgraduate students with learning disabilities attending higher educational institutions in Saudi Arabia. A study comprising twenty-two special needs learners who were diagnosed with a learning disability, with sixteen undergraduates and six postgraduates, was undertaken. Data was obtained through semi structured interviews conducted with the participants. The obtained results indicate the requirement for supplementary support services to assist undergraduate and postgraduate students with learning disabilities (LDs) in Saudi institutions of higher education.

Broadly speaking, the outcomes of these investigations substantiate the proposition that incorporating children with exceptionalities into conventional educational environments, imparting them knowledge pertaining to social competencies, and motivating their engagement in extracurricular pursuits all constitute critical factors that contribute to the cultivation of enhanced involvement in community life. The rationale underlying the integration of children into mainstream educational environments stems from the fact that this approach effectively addresses the three aforementioned factors. It is imperative to consider that the efficacy of these therapeutic interventions may differ both between individual children and across distinct types of disabilities. It is imperative to maintain constant awareness of this particular matter. When aiming to enhance a child's involvement in communal activities, it is crucial to consider comprehensively the contextual factors specific to the child with special needs.

6 METHODS

This study used the literature review as its methodology. The study gathered data from articles, books, videos and official circulations about the services and supporting systems used for students with special needs in Saudi Arabia. The study also relied on the descriptive approach to support the review by conducting interviews with school headmasters in 20 different schools. The interviews were content-analysed and reviewed to extract opinions on the models used in these schools. The interviews took place in the schools and there were 20 visits for a period of two weeks.

After conducting the content analysis of the main sources on the models of supporting system for students with special needs and conducting the interviews, the researcher concluded the findings of the study.

7 RESULTS AND DISCUSSION

The following sections present the results obtained from the review.

7.1 First: the Concept of Inclusion

Children who experience disabilities, commonly known as "children with special needs," are typically classified as a distinct group from individuals considered "typical" children. This perspective could be characterized as possessing an imprecise or flawed level of accuracy. According to Barber (2017), each child possesses a distinct blend of positive and negative attributes that are exclusive to their individuality. Hence, it is imperative to acknowledge the latent aptitude of children with exceptional needs while bearing in mind that such children require supplementary aid to fully realize their potential. Accordingly, the inherent capacity of the subject in question may be cultivated and effectively utilized to its maximum potential.

According to Carrington et al. (2016), schools that adopt an inclusive approach may offer alternative solutions to this matter, contingent upon their unique educational philosophy.
The notion of "inclusive education" pertains to a pedagogical approach that incorporates students with disabilities and those without into a common classroom environment. The notion that every individual has an inherent right to acquire and advance knowledge has fostered the emergence of inclusive education. The fundamental aim of this educational approach is to extend equal opportunities to all students, irrespective of their family background or current circumstances (Shater et al., 2023). In the development and implementation of a children's curriculum, it is imperative to acknowledge and account for the multifaceted nature of the students, as reflected in their individual personalities, diverse learning styles, unique interests, and concerns regarding their well-being.

Lim (2020) affirms that inclusive education is currently regarded as the most recent educational model intended for children with disabilities or special needs. This model is founded upon the notion of acknowledging all children as possessing similar physical and mental capacities, thereby aiming to inculcate the values of mutual respect and harmony amongst them. The concept of inclusive education originated in the United States during the 1990s. The underlying objective of undertaking this task is to equip students with the necessary skills and knowledge that would enable them to be productive and constructive members of the larger social stratum. The concept of inclusive education postulates that the process of instruction and acquisition of knowledge should accommodate the requirements of all learners, irrespective of their inherent abilities and competencies. Attaining the objective of inclusive education, which aims to facilitate the integration of all students into society, necessitates the provision of supportive and auxiliary services as a critical component.

7.2 Second: Models

The present study aimed to construct a review of the different models in evaluating e-learning systems for students with disabilities by taking into account the approaches for evaluating e-learning and information systems, identified through a thorough review of the existing literature. These findings were utilized as the basis for the development of the current model. Various viewpoints have been taken into account with regard to their ability to assess the effectiveness of e-learning, including but not limited to: quality factors, social aspects (including the quality of support systems, learners, and instructors), user beliefs (pertaining to perceptions of satisfaction and utility), acceptance rates (actual utilization), and the advantages inherent in utilizing e-learning systems (Al-Fraihat et al., 2020). The aforementioned dimensions represent the primary constituents attributed to the extant four methodologies.

According to Petter et al. (2008), the interdisciplinary nature and complexity of the domain resulted in information systems being characterized by limited depth and inaccuracy. DeLone and McLean (2003) proposed a model that aimed to evaluate the effectiveness of information systems. This decision was based on a thorough analysis of 180 scholarly articles published from 1981 to 1987, which discussed various methods for measuring information system success. The conceptual framework incorporates six discrete variables, which are system quality, information quality, utilization, user contentment, personal influence, and institutional influence.

DeLone and McLean (2003) advocated for additional refinement and authentication of their conceptual framework. A number of scholars in the field of information systems have endeavored to explore this particular model either in part or in its entirety (Igbaria & Tan, 1997; Seddon, 1997). The model was augmented by additional researchers through the inclusion of the construct of "service quality. " Jurison (1996) conducted a longitudinal study aimed at investigating the nature of benefits derived from information systems. The author posited that it is possible to evaluate the impact on individuals in the short term, however, assessing the impact on the organization requires a considerable period of observation.
The second model is the technology acceptance model, which represents a critical framework for understanding individuals' acceptance of new technologies. The year of 1989 marked a pivotal juncture in the assessment of information system efficacy, signifying a shift towards a second evaluative approach. Surendran (2012) posits that the theory regarding the measurement of the success of new technology through its acceptance and utilization has gained immense popularity and is widely employed in research. The present model was constructed utilizing the foundational principles of the Theory of Reasoned Action (TRA), and subsequently falls under the classification of social psychology theories. The proposed model posits that the utilization of new technology by users is influenced by various factors, as postulated by Davis (1989). According to Surendran (2012), the model postulates that perceived usefulness and perceived ease of use are contingent upon a variety of factors, including but not limited to external factors, social factors, cultural factors, and political factors (i.e., the implications of technology usage in a political context). Perceived usefulness and perceived ease of use function as pivotal determinants that influence attitudes towards technology usage as well as intention to use. The predominant influence on the utilization of a system is commonly attributed to the individual's behavioral inclination towards its use.

The user satisfaction model has been identified as a significant direction within the realm of information systems research. Satisfaction is deemed a pivotal metric in evaluating the triumph, efficacy, utility, and adoption of information systems (Bailey and Pearsons, 1983) within academic discourse. A commonly held view in scholarly discourse is that satisfaction constitutes an attitude which is internally held by individual users (Thong & Yap, 1996). The work of Remenyi and Money (1991) established the concept of user satisfaction as an indicator of the divergence between a user's preconceived expectations regarding an information system and the system's actual performance, as perceived by the user. They advanced the supposition that when an information system adequately fulfills the requirements of its users, the users' level of satisfaction will consequently increase. According to Evans (1976, as cited in Thong and Yap, 1996), reduced satisfaction with information systems could impede their utilization. The study carried out by Seddon and Kiew (1994) led to the conclusion that user satisfaction represents the most comprehensive and significant metric for determining the success of information systems.

The fourth model is the comprehensive quality of e-learning. Quality, despite being a general term, has been the subject of various approaches and models in the context of e-learning quality models. These models have taken into account various facets and methodologies pertaining to quality. MacDonald et al. (2001) introduced a noteworthy model referred to as the Demand-Driven Learning Model (DDLM) with the primary purpose of assessing the effectiveness of web-based learning (WBL) systems. The creation of the model was a direct response to the requisite of devising novel learning methodologies to cater to the demands of consumers. The presented model was composed of five dimensions, namely consumer demands encompassing quality content, delivery, and service, as well as superior structural attributes being regarded as the quality standard. According to MacDonald et al. (2001), the provision of high-quality content, delivery, and service in the context of e-learning necessitates a foundational understanding of learner needs and motivation. Additionally, effective learning facilitation requires the creation of a synergistic and supportive collaborative learning environment, the implementation of effective pedagogical strategies, regular assessment and evaluation of learners, and the provision of a learner-friendly e-learning environment.

The interviews with school principals regarding these models of e-learning support showed variations in their perspectives regarding which model to adapt by educators. Most of them agreed that the comprehensive quality model presents better opportunities for all students and teachers alike. They agreed that having quality as the main criteria will help in providing better quality education using the e-learning systems. The findings showed that the available e-
learning supporting systems can be evaluated based on different methods. These methods are presented above and show decision-makers and educators several options on how to test and verify the e-learning systems they are using.

8 CONCLUSION

An inclusive e-learning education is one of the solutions that allows children with disabilities, regardless of the nature of their challenges, to access the same quality of education as their peers without disabilities. This approach caters to the holistic needs of such children encompassing physical, intellectual, social, emotional, linguistic, and other domains. It is crucial for educational institutions to cultivate a milieu of inclusivity that is conducive to the co-education of all children, regardless of the type of their individual disabilities. The concept of an inclusive education system highlights that diversity, encompassing distinctiveness and variations, emanates from societal structures, rendering it imperative to value and esteem all human beings, irrespective of their constraints. Furthermore, all individuals possess the fundamental right to access education within the same institution. It is imperative to establish a diversified community composed of various individuals. In contemporary education, inclusivity is facilitated by the integration of children who present disabilities with typical children in diverse learning settings. This approach seeks to nurture the fullest potential of all children by encouraging joint learning, and at the same time empowering those with disabilities to lead more autonomous lives. The pedagogical approach under discussion is commonly known as inclusive e-learning supporting system.

The study recommends performing other research on other samples, such as teachers, students and families to check the validity and strength of the e-learning systems used in Saudi Arabia. Future research can focus on other dimensions and criteria for evaluating e-learning systems.

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