JOURNAL OF INTERNATIONAL CRISIS AND RISK COMMUNICATION RESEARCH
ISSN: 2576-0017
2024, VOL 7, NO S11

Enhancing Academic Self-Efficacy through Distance Learning: A Structural Equation Model Analysis of Key Predictors among Gifted Undergraduate Students

Rommel AlAli

1. Associate professor, The National Research Center for Giftedness and Creativity, King Faisal University, Saudi Arabia. ralali@kfu.edu.sa

ABSTRACT

This study utilized structural equation modeling to examine the relationships between distance learning self-efficacy, its factors, and academic self-efficacy among gifted undergraduate students. The findings revealed that self-efficacy for distance learning and its factors, including Experience and knowledge in teaching, Engagement (Communication and interaction), providing feedback, Influencing society, and lastly, Encouraging learner motivation and attitude, had significant predictive relationships and direct positive effects on academic self-efficacy in this population. The study highlights the importance of prioritizing key components such as knowledge acquisition, effective communication, and meaningful interaction to enhance self-efficacy for distance learning among gifted undergraduates. It recommends the implementation of tailored support programs, integration of academic support, and technology-enhanced learning environments, with continuous monitoring and evaluation, to facilitate sustained improvements in academic self-efficacy over time.

KEYWORDS: Distance learning self-efficacy, Academic self-efficacy, Gifted undergraduate students, Structural equation modeling, Predictive and influence relationships.

1. Introduction

The worldwide health crisis has made it essential to depend entirely on learning platforms which have been widely embraced in schools globally as a component of the education system nowadays. As a result of this shift, towards remote learning systems in education institutions due to the situation globally there is now an increased urgency for ongoing assessment of all facets of these distance learning setups. The effective functioning of such distance education tools hinges, on endeavors and strategies geared towards creating an advanced educational structure that addresses the fundamental requirements of students. There are aspects and components that contribute to the success of a learning system; the setting, for learning activities; how engaged students are; their inner drive to learn; thirst for

knowledge; and the use of multimedia tools (Shehab et al., 2022). These elements are essential, in improving the effectiveness and caliber of distance education experiences.

The effectiveness of a distance learning system relies not on its setup and programs but also heavily depends on the individual learner who is, at the core of its success as the primary user and beneficiary of the systems offerings. Understanding the learners personality plays a role in shaping how distance education functions. It is essential to delve into facets of these processes and mechanisms not for comprehending their essence and scope but also for establishing evaluation techniques to gauge their influence, on the systems effectiveness. The COVID 19 outbreak has hastened the demand, for learning in nations worldwide. In the beginning education transitioned entirely to learning before a mixed approach was adopted on. As a result ensuring the effectiveness of distance education, as the means of maintaining consistency is crucial. Strategies, procedures and techniques are constantly refined to elevate learning activities and interactions. Moreover we also consider self belief as it greatly impacts achievements (AlAli & Salehh 2023).

Self belief plays a role, in understanding actions and behaviors and was first introduced by Bandura in his comprehensive theory that delves into this concept in depths. According to Banduras theory of self efficacy dimensions and origins are identified as components of the social learning theory. Bandura (1977; 20) suggests that self efficacy signifies an individuals confidence in their capability to manage their behaviors. Individuals with self belief are more inclined to embrace strategies when faced with challenges and navigate through situations, with sound judgment. Bandura defines three aspects of self confidence; self confidence focusing on abilities cognitive self confidence linked to beliefs and controlling thoughts and emotional self confidence dealing with handling emotions and feelings, in different life scenarios (Calaguas & Consunji 2022 and AlAli & Saleh 2022). Together these aspects shape a persons perception of self efficacy. Impact how they behave and react in their surroundings.

Bandura first introduced the idea of self efficacy in 1977 as an element, in grasping human behavior intricacies and complexities within social learning theory frameworks. Self efficacy in Banduras theory encompasses facets and origins that play significant roles in shaping an individuals confidence, in managing their behaviors and decisions. People who have confidence, in themselves are more inclined to use strategies to overcome obstacles and make thought out choices (Bandura 1977). When it comes to virtual learning settings like classes or courses the term Online Learning Self Efficacy (OLSE) means a students belief, in their ability to take actions that lead to achieving their goals in an online setting that utilizes technology. Saleh & AlAli (2022) Hayashi et al., Zhu (2019) Peechapol et al. And Prior et al. have delved into the concept of Online Learning Self Efficacy, in their research works shedding light on how learners perceive and assess their confidence and beliefs regarding their success, in online learning settings. This knowledge can be used to improve how we help learners feel more confident and make their online learning experiences better through interventions and teaching methods.

Computer Use Self Efficacy (CUSE) is, about how confident an individual feels in

their skills to use computers and technology effectively for certain tasks or activities. It mirrors a persons self assessment of their abilities and comfort level when using computer based tools and applications. CUSE covers computer related activities such, as navigating software interfaces solving problems using productivity tools, coding and any other tasks linked to computer usage(Alquarashi,2016).Higher levels of confidence, in using computers have been shown to contribute to engagement and performance in learning. Additionally there is a connection between increased confidence in computer use and reduced anxiety when using computers. This can have an effect on achievement. Confidence in computer use also plays a role, in determining whether learners will choose to use technology for their learning activities. Understanding and evaluating Computer Use Self Efficacy (CUSE) can offer insights, into students confidence and proficiency in utilizing computers. By nurturing and bolstering levels, among students educators can enable them to navigate technologies confidently lower stress levels and foster academic achievement. Furthermore acknowledging the importance of CUSE can guide the creation and execution of methods that motivate students to adopt resources in their endeavors.

Alqurashi (2016) besides discussing Computer Use Self Efficacy (CUSE) also highlighted a task concept known as Internet and Information Seeking Self Efficacy (IISE). The significant impact of IISE, on learning outcomes has been extensively explored by Clark (2017). Both researchers have underscored the role of IISE in information seeking endeavors placing more importance on it, than procedural knowledge or system features. The idea, behind IISE focuses on how confident individualsre in their capacity to find and use information online efficiently and effectively They include abilities like searching the internet effectively assessing the reliability of sources and using materials for learning purposes Alqurashi (2016)s and Clark (2017)s research emphasizes the significance of IISE, In online education, it is claimed that students with good IISE perform better in their learning activities and efforts. Exploring and nurturing Information Interaction and Search Experience (IISE) can play a role, in shaping approaches and actions to enhance students' ability to seek information and make the most of their online learning journeys. Encouraging IISE enables teachers to equip students, with the abilities and skills needed to effectively navigate the abundance of information and employ it to advance their objectives.

Self Efficacy, with Learning Management Systems (SE LMS) denotes how individuals perceive their proficiency and capability when it comes to utilizing a Learning Management System (like a platform for learning). Researchers have highlighted its significance as an element influencing the satisfaction of learners (Lee and Hwang 2007; Martin et al., 2010). Alqurashi (2016) similarly emphasized SE LMS as a self efficacy concept related to tasks, within the system. It's important to mention that the benefits of LMSSE might be more relevant, for learners than just online learners alone. This means that while not every online learner may experience the impact of LMSSE on their learning outcomes it has been studied by researchers as a factor in predicting learning results. Some studies suggest that LMSSE plays a role in determining outcomes compared to the actual extent of engagement, in online activities (Broadbent 2016; Martin et al., 2010). The connection, between LMSSE

and learner involvement has been identified as an one (Al Barakat et al., 2022; et al., 2016). This link plays a role in easing hurdles and difficulties associated with the Learning Management System (LM). It reinforces learners' confidence, in their capability to finish a course using an LM system reflecting Bandura's (2010) views on self assurance. Exploring the importance of LMSSE can help teachers and instructional creators in building nurturing learning spaces that boost students' confidence, in utilizing the LMS system. While offering tailored assistance and tools to nurture students' LMSSE skills Educational stakeholders may enhance student contentment levels, enrollment rates and overall achievements, in blended learning environments.

As distance learning becomes more prevalent, with the advancements of e learning and platforms known for their quality and the wide array of communication technologies available (referencing Yavuzalp & Bahçivans work from 2020) students increasingly require the abilities and competencies necessary for effectively navigating these digital tools and platforms for academic success. Self efficacy stands out as a element that significantly influences how well individuals adapt to and manage distance learning environments—a key determinant of achieving positive outcomes (as discussed by Ithriah et al., 2020 and Zimmerman & Kulikovics research, from 2016). To boost students' self confidence effectively in distance learning settings requires recognizing the aspects and factors that impact their confidence levels in this learning environment. Educators and educational institutions can develop strategies and resources to help students enhance their skills and belief in their abilities for learning through grasping these influences. Self efficacy, in online learning pertains, to an individual's perception of their capability to complete the tasks associated with education successfully. In online learning settings experts emphasize that having self confidence can hinder individuals from completing the program because they doubt their skills, for success in the realm (as cited in Zimmerman and Kulikowich 2016). Moreover some may opt out of enrolling in programs due, to feeling inadequate. Acknowledging the importance of self confidence, in internet based education settings teachers and educational establishments can introduce measures and assistance strategies to boost students' confidence in themselves thus encouraging participation and continuous commitment, to online learning activities.

Certainly! A persons skills and performance, in virtual learning situations are factors in their achievements online distance learning self confidence involves the capability to efficiently plan and control the learning process from afar It includes a variety of abilities and qualities that aid in attaining success in a remote learning environment such, as personal organization motivation to take initiative setting goals managing time communicating effectively and acquiring the essential technical skills. When we delve into the notion of self confidence or belief, in oneself regarding ones abilities to effectively arrange and oversee the journey comes to light It covers a range of abilities and actions that assist people in achieving success in academia including personal organization, time management,self drive goal setting, focus, persistence and utilizing efficient learning as well as study techniques. Upon examining the link between confidence in oneself for learning and prowess in academics it becomes apparent that there is a connection, between the two. Individuals possessing

confidence in their learning capabilities frequently exhibit superior academic performance attributable to their time management skills and resource organization as well as their self motivation for learning and achieving academic goals.. Research mostly focuses on assessing self confidence, for learning and academic confidence instead of exploring how they interact and influence each other. The current research focuses on exploring how self belief, in distance learning impacts an individuals confidence, across aspects.

1. Examine if distance learning self-efficacy influences academic self-efficacy among gifted undergraduate students?

2. Examine if distance learning self-efficacy factors, including Experience and knowledge in teaching, Engagement (Communication and interaction), providing feedback, Influencing society, and lastly, Encouraging learner motivation and attitude, impact academic self-efficacy among gifted university students?

3. What is the proposed model of the measurement of distance learning self-efficacy, along with its associated factors, on the academic self-efficacy of gifted university students using structural equation modeling?

2. Previous studies

Alqurashis study, in 2016 hinted at a link between self confidence beliefs in online education like academic confidence in oneself and abilities with computers and the internet as well as managing learning well independently. Self efficacy pertains to an individual's confidence in their capability to carry out desired actions and plays a role, in motivating humans and impacting their performance and emotional health. People who feel uncertain, about their abilities often shy away from tasks because they see them as intimidating challenges to overcome. They typically aim for targets. May not fully commit to reaching them. Their attention is usually on their uncertainties and fears of failure than on their strengths and potential areas for growth which can lead them to give up of looking for ways to progress. On the contrary individuals with levels of self confidence show attitudes and approaches tackling challenges, with assurance and persistence (Bandura, 2010). Exploring the significance of self confidence, in education could benefit both teachers and students by boosting motivation and success, in the learning setting.

Students' academic self confidence (ASE) relates to how they view their potential, for success in school settings. This includes their confidence in their skills and their use of self regulated learning methods such, as planning and analyzing tasks and projects to prepare for learning outcomes (Neilsen et al., 2018). Research conducted in the past has shown that ASE can have an influence, on academic results such, as academic achievement motivation and views regarding the effectiveness of internet based or online learning platforms (Honicke and Broadbent, 2016; Lim et al., 2016; Reychav et al., 2016). These literatures have demonstrated that when students possess higher levels of ASE, they are more likely to achieve better academic results, exhibit increased motivation to learn, and perceive online learning systems as effective tools for their educational pursuits. Understanding the role of ASE in students' academic experiences can provide valuable insights for educators and

policymakers in fostering a supportive learning environment that promotes self-efficacy beliefs and self-regulated learning strategies. By nurturing students' ASE, educational stakeholders can enhance their academic performance, motivation, and engagement within internet-based or online learning settings.

In a study, by Wu in 2023 revealed that Online Learning Self Efficacy (OLSE) and Social Presence (SP) had an impact on student engagement. In addition to this discovery was that Informal Digital Learning of English (IDLE) had an effect on student engagement with Social Presence playing a part, as mediator to some extent. The results suggest that casual online English learning has an impact, on students participating actively in classes; the feeling of being socially connected during online interactions supports this effect as per findings, by Ali (2021). The study revealed that e learning participants showed confidence levels when it came to duties and higher confidence levels when using information and communication technology (ICT).The research findings showed a connection, between believing in ones abilities and feeling confident in using technology tools like computers and the internet effectively in educational settings... Additionally... The study highlighted that feeling competent in utilizing IT tools can strongly influence ones belief, in their capabilities.

In a study, by Tang et al., conducted in 2022 they researched the self belief in seeking information and learning online as the skill level of performance among undergraduate and graduate students in online education settings. By using statistical analysis methods they found connections among these factors. Notably the belief in learning showed the highest association, with performance skills compared to the other aspects studied. The relationship, with the correlation was discovered to be between education and self belief, in seeking information.

In a study, by Erozkan (2013) the main goal was to explore how teenagers communicate and solve issues while also assessing their perception of self efficacy in situations with a special focus on how communication skills and problem solving abilities influence social self confidence predictively. The findings showed a connection between communication skills and problem solving abilities with self efficacy levels among adolescents. Furthermore the research highlighted that effective communication and interpersonal problem solving are factors that determine an individuals confidence, in interactions. The study, by Gebresilase and Zhao in 2023 aims to explore how student teachers interactions and students' confidence in their abilities influence the success of Ethiopian university students.Their research revealed a connection between performance of students with their belief in their own capabilities and how they interact with their teachers.In addition the study found that the confidence university students have in their skills plays a role in linking the interactions, with teachers to success. In university environments the interaction, between students and teachers along with students belief, in their abilities play crucial roles in determining academic success.

In the research conducted by Aziz, Azizah, and Rifa'i (2024), it was observed that motivation is significantly influenced by academic self-efficacy, social support, and interpersonal communication, collectively accounting for 98.9%. This leads to the conclusion that heightened levels of self-efficacy, effective interpersonal

communication with supervisors, and increased support from close associates contribute to an enhanced motivation among students in undertaking and successfully completing their theses. Conversely, lower levels of these factors exhibit a reverse effect on student motivation.

3. Theoretical framework

With the global outbreak of the COVID-19 pandemic, educational institutions worldwide have been compelled to close their doors, leading to a rapid shift towards online learning (UNESCO, 2020). This transition has created a gap in the existing literature, prompting numerous studies to address the resulting challenges associated with technology in the learning process. These studies have highlighted various technological barriers that have emerged during the pandemic, including issues related to the availability of necessary tools (such as internet access and computer hardware) as well as the competence and utilization of technological platforms like learning management systems. Consequently, these findings have emphasized the significant role of technology in modern-day learning, leading to pedagogical implications for educational practices (AlAli & Saleh, 2022; Calaguas & Consunji, 2022; Aguilera-Hermida et al., 2021; Amri & Alasmari, 2021; Baticulon et al., 2021). These studies collectively contribute to a deeper understanding of the challenges and implications associated with technology use in the context of online learning during the pandemic.

Tsai et al. (2019) have highlighted the importance of measuring self-efficacy at a task-specific level to enhance accuracy and predictive capacity. Building upon this, several studies have investigated the issues related with self-efficacy for online learning and have identified four primary dimensions. The first dimension is computer self-efficacy, which encompasses the skills and abilities related to online communication and interactions. This includes proficiency in using digital tools and platforms effectively. Self-efficacy pertains to an individual's confidence in their capacity to traverse online learning environments and engage in successful communication, particularly among those with high computer self-efficacy. The second dimension is internet and information-seeking self-efficacy, which focuses on an individual's confidence in locating and utilizing online knowledge resources. This dimension assesses the ability to search for information, critically evaluate sources, and extract relevant information from online platforms. Individuals with high internet and information-seeking self-efficacy are adept at leveraging online resources to support their learning. The third dimension is learning management system (LMS) self-efficacy, which encompasses various factors such as social influence, prior experience with online learning, and the availability of knowledge, feedback, and rewards within the learning management system. It examines how comfortable and competent individuals feel in navigating and utilizing specific online learning platforms or systems. LMS self-efficacy has a crucial contribution in learners' capability to effectively engage with the online learning environment. The fourth dimension is academic self-efficacy, which is influenced by learner motivation and attitude towards the online learning process. This dimension assesses individuals' beliefs in their own abilities to succeed academically in the online

learning environment. High levels of academic self-efficacy contribute to learners' perseverance, engagement, and achievement in online learning. These dimensions have been explored and documented in studies conducted by Alqurashi (2016), Peechapol et al. (2018), Zhu (2019), AlAli & Saleh (2022), and Calaguas & Consunji (2022). By understanding and considering these dimensions of self-efficacy, educators and researchers can develop targeted interventions and support strategies to strengthen learners' confidence and effectiveness in online learning environments. This knowledge and expertise can guide the development of online courses, the provision of appropriate resources, and the implementation of supportive measures to facilitate optimal learning outcomes for online learners.

In their study, Saleh and Al-Ali (2022) employed a comprehensive scale to assess self-efficacy in the specific context of online learning. In addition to the previously mentioned dimensions, there are various other factors that influence self-efficacy for learning in general and in the online environment specifically. These factors contribute to a comprehensive understanding of self-efficacy and its impact on learners' effectiveness in online learning. By considering these additional factors along with the previously mentioned dimensions, educators and researchers can gain a more comprehensive understanding of self-efficacy and its influence on learners' effectiveness in online learning. This knowledge can inform the development of targeted interventions, support strategies, and instructional design approaches to foster self-efficacy and optimize learning outcomes in the online environment.

The factors were categorized into five distinct dimensions. The first dimension, Instructional knowledge and experience (IKE), focused on evaluating learners' familiarity with distance learning systems. This dimension encompassed their proficiency in installing and utilizing the necessary software, as well as their competence in using search engines and navigating educational materials online. The second dimension, Communication and interaction (CI), focused on how students could engage and communicate with others using online learning tools. This dimension encompassed factors such as ease of communication with teachers and fellow learners, social interaction capabilities, active participation in discussion boards, and the utilization of synchronous technologies for chat and communication purposes. The third dimension, Feedback (F), evaluated the provision of material or motivational feedback via distance learning platforms. It assessed learners' aptitude in receiving direct feedback, benefiting from immediate and delayed feedback, and adapting their learning methods based on feedback to aid in providing answers and adjusting any mistakes. The fourth dimension, Social impact (SI), explored learners' assimilation of the self-culture of reference groups and their ability to demonstrate skills, understand and monitor others, and practice various methods of social effect in specific social situations. This dimension included activities such as monitoring others' opinions, interacting with teachers and peers, providing constructive feedback, and accepting diverse ideas. The fifth and final dimension, Learner motivation and attitude (LMA), focused on learners' motives, motivators, and orientations to engage in activities and accomplish tasks within distance learning platforms. This dimension encompassed learners' ability to carry out proposed activities, seek prerequisite learning requirements, establish performance evaluation criteria, and engage in self-directed learning. By utilizing this comprehensive scale

and exploring these dimensions, the study aimed to provide a nuanced understanding of self-efficacy in online learning and shed light on the factors that contribute to learners' confidence and effectiveness in this context.

In their study, the researchers employed the academic self-efficacy scale developed by Nielsen et al. (2018) to assess learners' beliefs in their own academic abilities within the online learning context. The scale was specifically designed to measure self-efficacy beliefs related to academic tasks and performance in distance learning environments. The academic self-efficacy scale encompasses various items that gauge learners' confidence in their ability to engage in academic activities, meet course requirements, and achieve desired learning outcomes within the online learning setting. It evaluates learners' beliefs in their capacity to effectively manage their time, set goals, organize their study materials, and apply appropriate learning strategies in the online learning environment. Moreover, the scale assesses learners' confidence in their problem-solving skills, critical thinking abilities, and their perceived level of academic competence within the online learning context. By utilizing the academic self-efficacy scale, the researchers aimed to capture a comprehensive understanding of learners' beliefs in their academic abilities in the online learning environment. This scale served as a valuable tool for assessing and measuring the specific dimension of academic self-efficacy, providing insights into learners' confidence and perceptions regarding their academic success in online learning.

The structural relationship of distance learning self-efficacy and its factors, and its impact on academic self-efficacy (a proposed model)

The current research aims to develop a comprehensive model that explores the structural relationship between self-efficacy for distance learning, its underlying factors, and their impact on academic self-efficacy. This model will shed light on the intricate dynamics and mechanisms involved in the successful pursuit of education in a distance learning environment. The proposed model will delve into the individual factors that contribute to Distance learning self-efficacy, including Experience and knowledge in teaching, Engagement (Communication and interaction), providing feedback, Influencing society, and lastly, Encouraging learner motivation and attitude. These factors have been identified as key elements influencing one's ability to effectively engage in distance learning and achieve academic success. To ensure the psychometric properties including validity and reliability of the proposed model, the study will employ structural equation modeling. This statistical technique allows for a comprehensive examination of the direct and indirect effects of self-efficacy for online or distance learning and its factors on academic self-efficacy among individuals. Through this analysis, the study aims to provide a deeper understanding of the interplay between these constructs and their impact on educational outcomes.

The proposed model, depicting the structural relationship between Distance learning self-efficacy, its underlying factors, and their impact on academic self-efficacy, is visually represented in Figure 1. This visual representation will serve as a valuable tool for illustrating the complex relationships and connections proposed in the study.

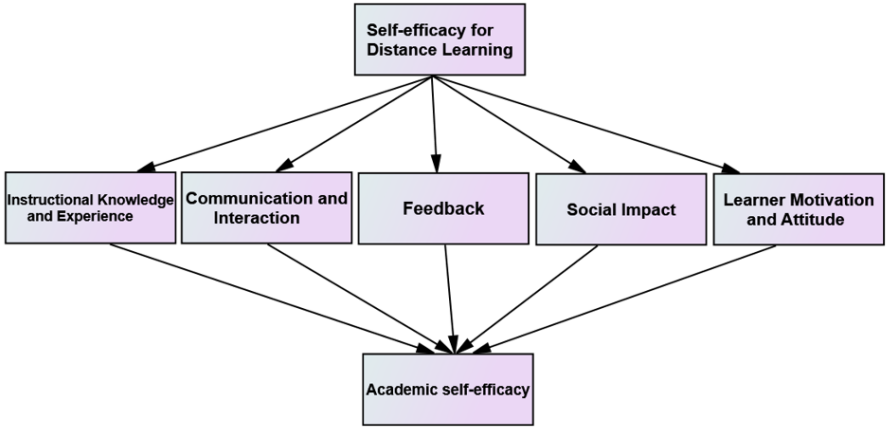

Figure 1: A Proposed Model Illustrating the Structural Relationships of Distance learning self-efficacy, Its Underlying Factors, and Their Impact on Academic Self-Efficacy

4. Methodology

This study employed a descriptive and correlational approach to examine the prediction and effects of distance learning self-efficacy and its factors on academic self-efficacy among gifted undergraduate students. The aim was to identify the relationships between these study variables. The findings contribute to a deeper understanding of the factors that influence academic self-efficacy in the context of distance learning for gifted undergraduate students.

Population and Sampling

The target population for this study included all gifted students enrolled in Saudi universities during the first semester of the academic year 2023/2024. These universities were located in five regions across the Kingdom: north, south, east, west, and center. To ensure representation from each region, Some of the most well known universities, in every region were recognized. The researchers contacted the university administrations to seek their cooperation in distributing the research questionnaire. A statement of scientific research ethics was attached to ensure ethical considerations were addressed. The study sample was selected randomly from the pool of gifted students across various faculties in Saudi universities, resulting in a total sample size of 210 participants. To facilitate data collection, the universities sent letters to the selected students, inviting them to take part in the study. Additionally, colleagues and supervisors were involved in overseeing the distribution process and encouraging students to respond. Google Forms was used as the data collection tool, and questionnaires were shared with potential participants through email and WhatsApp. This approach aimed to ensure a diverse representation of gifted students across Saudi universities and regions, allowing for a comprehensive understanding of their experiences and perspectives. By utilizing online survey tools and involving university administrations, the researchers aimed to maximize

participation and collect data efficiently.

Instrument

The study utilized a comprehensive scale developed by Saleh and AlAli (2022) to assess self-efficacy in the context of distance learning. The study employed a comprehensive scale, developed by Saleh and Al-Ali (2022), to assess self-efficacy in the setting of distance learning. This measurement tool looked into aspects that impact self-efficacy and delved into the facets that underpin confidence, in learning through platforms. The factors were categorized into the following dimensions: first, Experience and knowledge in teaching (IKE), second, Engagement (Communication and interaction) (CI), third, Providing feedback (F), fourth, Influencing society (SI), and lastly, Encouraging learner motivation and attitude (LMA).

The instrument and its dimensions provide a comprehensive framework for evaluating self-efficacy in online learning. By assessing these factors, researchers can gain insights into learners' capabilities, motivations, and orientations, thereby informing instructional strategies and interventions to enhance self-efficacy and improve learning outcomes in distance learning environments.

academic self-efficacy is a critical factor influencing online learning. It is shaped by learners' motivation, attitudes, and beliefs regarding their academic abilities in the online learning environment. Individuals with high academic self-efficacy believe in their capacity to successfully complete academic tasks, engage in self-directed learning, and achieve desired learning outcomes. This belief in their academic abilities influences their level of engagement, persistence, and overall performance in online learning.

In their study, the researchers employed the academic self-efficacy scale developed by Nielsen et al. (2018) to assess learners' beliefs in their own academic abilities within the online learning context. The scale was specifically designed to measure self-efficacy beliefs related to academic tasks and performance in distance learning environments. The academic self-efficacy instrument encompasses various items that gauge learners' confidence in their ability to engage in academic activities, meet course requirements, and achieve desired learning outcomes within the online learning setting. It evaluates learners' beliefs in their capacity to effectively manage their time, set goals, organize their study materials, and apply appropriate learning strategies in the online learning environment. Moreover, the scale assesses learners' confidence in their problem-solving skills, critical thinking abilities, and their perceived level of academic competence within the online learning context. By utilizing the academic self-efficacy scale, the researchers aimed to capture a comprehensive understanding of learners' beliefs in their academic abilities in the distance-learning environment. This scale served as a valuable tool for assessing and measuring the specific dimension of academic self-efficacy, providing insights into learners' confidence and perceptions regarding their academic success in online learning.

Furthermore, as part of the study, the researchers employed the academic self-efficacy scale developed by Nielsen et al. (2018). This scale specifically assesses the learner's confidence in their ability to effectively participate in academic activities

and attain desired learning outcomes within the online learning setting. It encompasses various aspects such as the learner's belief in their capacity to comprehend course content, successfully complete assignments, actively engage in discussions, and perform well in assessments. The scale comprises a total of five items, providing a concise yet comprehensive measure of academic self-efficacy learning context.

Verifying the validity and reliability of the scales

The scales validity was confirmed through a delicate process. A panel of nine specialists from Saudi universities carefully examined the items included in the instrument. Based on their expert opinions, any ambiguous or unclear wording was clarified, some items have been rephrased and grammatical errors have been corrected., and items that were deemed inappropriate or duplicated by, over 30 percent of the experts were removed. This expert review stage aimed to enhance the clarity and appropriateness of the instrument.

To further ensure the validity and reliability of the scale, a pilot study was conducted with 35 gifted undergraduate students. Their responses and feedback were collected and utilized to refine and modify the final version of the scale. This iterative process ensured that the instrument accurately captured the intended constructs and was suitable for the target population.

To evaluate the construct validity of the first scale, Rasch model analysis was employed using Winsteps software, version 3.68.2. The Rasch model is a robust statistical approach widely used in psychological and educational measurement. It provides an objective and rigorous assessment of the instrument's validity by examining the relationships between the items and the latent construct being measured. By utilizing the Rasch model analysis, the researchers could ascertain the quality and effectiveness of the scale in measuring the desired construct accurately.

The data collected for the study underwent analysis to evaluate its psychometric properties including validity and reliability using the Rasch Model. Numerous pointers were tested to evaluate the quality of the items and the dimensionality of the data. Item polarity analysis was conducted using point-measure correlation (PTMEA) to assess the consistency of the items. Values ranging between 0.2 and 1 were considered acceptable, indicating the items were measuring the intended construct effectively. The Infit and outfit mean square (MNSQ) values were also evaluated, with values between 0.4 and 1.5 considered appropriate, indicating that the items fit the Rasch Model well. The standardized fit statistic (Zstd) values were examined, and values falling within the range of -2 to 2 were considered desirable, indicating a good fit between the observed data and the Rasch Model.

Also worth noting is that the requirement, for dimensionality was established at a minimum of 40% suggesting that the dimensions effectively represented the diversity in the data set. A consistent dimension arrangement was confirmed when the unexplained variability in the contrast was under 15%. Additionally evaluated were the distinctions between items and individuals. The benchmark for item approval surpassed 0·50 with regards, to reliability level which signaled item dependability. The approved threshold, for distance was determined to be a

minimum of 2 units to ensure differentiation among individuals (AlAli & Sale 2022 and AlAli & Al Barakat 2022).

The study includes Table 1 showing the results of analyzing the dimensionality data in relation, to calibration measurement analysis findings indicate that the measures explain over 40% of the variance and than 15% unexplained variance, in the first contrast confirming that the dimensionality data align well with the Rasch Model.

Table 1. The dimensionality of the Self Efficacy Scale items.

	Empirical		Modeled	
Total raw variance in observations	78.3	100%		100%
Raw variance explained by measures	45.6	44.2%		48.7%
Raw variance explained by persons	24.5	17.1%		27.4%
Raw Variance explained by items	23.1	22.1%		24.2%
Raw unexplained variance (total)	51.0	51.7%	100%	51.3%
Unexplained variance in 1st contrast	5.2	5.8%	8.3%	
Unexplained variance in 2nd contrast	4.7	5.5%	7.9%	
Unexplained variance in 3rd contrast	4.1	5.1%	6.8%	
Unexplained variance in 4th contrast	3.3	4.6%	6.4%	

The instrument's validity was assessed by looking at the infit mean square (MNSQ). The MNSQ values showed a level of validity, for the instrument. The MNSD values that assess how well the instrument fits ranged between 0.4 To 1.5, Indicating an alignment with the Rasch Models standards. This outcome is in line with the item polarity analysis conducted to check item consistency through point measure correlation (PTMEA). The ideal range, for the PTMEA values is between 0 and 1 to reinforce the validity of the instrument. This is supported by a standardized statistic value (Zstd) which should typically be in the vicinity of -2 to 2.This value was obtained through the analysis presented in Table 2, confirming that the instrument's measurements align well with the Rasch Model's expectations.

Table 2. Item Fit Analysis for Self-Efficacy Scale.

items	Measure	Model S.E	Infit		outfit		Pt-measure	
			MNSQ	ZSTD	MNSQ	ZSTD	CORR	EXP
IKE 5	0.19	0.07	1.36	1.9	1.94	1.8	0.44	0.64
IKE2	0.03	0.06	1.36	1.8	1.17	1.9	0.54	0.67
IKE 8	0.50	0.07	1.16	1.8	1.87	1.5	0.56	0.68
IKE6	0.04	0.06	1.25	0.9	1.33	1.2	0.56	0.69
CI4	0.06	0.07	1.45	1.6	0.97	-0.3	0.57	0.64
LMA8	0.65	0.07	1.26	1.7	1.81	1.6	0.57	0.65
SI10	0.22	0.06	1.06	-1.2	1.31	1.9	0.57	0.63
IKE3	0.36	0.06	1.24	-0.3	0.86	-1.4	0.58	0.59
SI9	0.50	0.06	1.08	-0.7	0.97	-0.9	0.58	0.61
IKE1	0.38	0.06	1.21	0.7	0.82	-0.8	0.60	0.67
LMA10	0.60	0.06	1.43	-1.6	1.34	-0.7	0.60	0.67
SI8	0.35	0.07	1.06	-0.8	1.09	-0.9	0.60	0.62
LMA7	0.79	0.06	0.95	0.3	1.17	0.4	0.61	0.64
SI7	0.17	0.07	0.97	0.6	0.89	-1.6	0.61	0.67
F4	0.22	0.06	1.36	0.8	1.14	-1.3	0.61	0.65
IKE4	0.24	0.07	0.90	0.6	1.06	-1.1	0.63	0.65
CI3	0.34	0.06	1.05	-0.5	0.84	1.3	0.63	0.63
LMA5	0.27	0.07	1.00	-0.6	1.36	-0.4	0.63	0.65
SI1	0.15	0.07	0.88	1.1	0.72	1.6	0.64	0.72
F3	0.13	0.06	0.94	1.2	0.70	1.2	0.64	0.69
CI10	0.04	0.06	0.88	0.7	0.87	1.1	0.65	0.66

CI5	0.10	0.06	0.92	1.1	1.46	0.3	0.65	0.68
IKE10	0.08	0.06	1.16	0.2	1.03	0.9	0.65	0.66
LMA9	0.26	0.06	0.81	0.3	1.25	0.7	0.65	0.64
F2	0.34	0.07	0.86	0.0	0.93	1.0	0.65	0.68
LMA2	0.27	0.06	0.91	0.6	0.79	1.7	0.66	0.64
CI9	0.15	0.07	0.98	0.6	0.83	0.4	0.66	0.66
LMA3	0.09	0.06	0.93	0.2	0.98	-1.1	0.66	0.68
LMA6	0.35	0.07	1.04	0.2	1.48	0.6	0.66	0.69
CI1	0.35	0.06	1.11	0.5	0.90	-1.3	0.66	0.67
IKE7	0.26	0.07	1.05	0.4	1.00	0.7	0.67	0.68
CI8	0.18	0.06	0.98	0.3	0.85	-0.5	0.67	0.66
LMA1	0.62	0.07	0.97	0.9	1.06	0.6	0.67	0.69
SI6	0.57	0.07	0.97	1.2	0.83	1.5	0.67	0.64
F8	0.26	0.06	0.92	0.2	0.86	1.2	0.67	0.67
F5	0.18	0.06	0.85	0.3	0.87	-1.0	0.67	0.68
CI2	0.45	0.06	0.98	-1.2	0.78	-1.5	0.68	0.64
F6	0.24	0.06	0.93	-1.6	0.67	-0.9	0.68	0.69
LMA4	0.35	0.06	0.87	0.6	0.86	-0.2	0.68	0.67
SI5	0.45	0.07	0.78	-0.3	0.97	-1.6	0.68	0.66
SI3	0.26	0.06	1.03	0.7	0.84	-1.6	0.69	0.68
SI2	0.63	0.07	0.87	1.6	0.74	1.8	0.69	0.67
IEK9	0.40	0.06	0.78	0.8	1.37	-1.4	0.70	0.73
SI4	0.16	0.06	0.92	-1.3	0.92	-0.4	0.70	0.68
F10	0.13	0.06	0.94	-1.2	0.67	-1.8	0.70	0.70
CI7	0.57	0.06	0.73	-1.1	0.83	-1.2	0.71	0.67
CI6	0.40	0.06	0.89	-1.5	0.93	-0.9	0.72	0.71
F9	0.06	0.06	0.92	-1.7	0.59	-1.9	0.72	0.67
F1	0.19	0.06	0.63	-1.6	0.70	-1.7	0.73	0.73
F7	0.18	0.07	0.73	-1.9	0.64	-1.4	0.74	0.69

When applying the Rasch model, for accuracy assessment is essential to assess both the reliability of individuals and items involved in the process thoroughly. To adequately meet reliability standards, the value should exceed 50%. Furthermore the values, for both item and person separation should surpass 2 to be regarded as suitable based on research results (AlAli, Alsoud, Athamna, 2023; Saleh et al., 2023). The reliability of the instrument in this research was assessed by measuring both person reliability and item reliability. The results, presented in Table 3, indicated that the scale demonstrated an appropriate level of reliability for its items. This implies that the items within the scale consistently measure the intended construct and provide reliable results. By evaluating person reliability, the study ensured that the scale accurately distinguished between individuals with different levels of the measured construct. Similarly, the assessment of item reliability confirmed that the items effectively discriminated between respondents based on their levels of the construct.

Table 4. Separation and Reliability Analysis for Persons and Items on the Self-Efficacy Scale

	Score	Count	Measure	Error	Infit		Outfit	
					MNSQ	ZSTD	MNSQ	ZSTD
MEAN	177.8	35.0	1.16	0.21	1.05	-0.5	1.09	-0.4
S.D	5.7	0.0	1.39	0.13	0.66	2.5	0 .84	3.7
REAL RMSE	0.28							

ADJ. SD	1.36						
SEPERATION	4.62						
PERSON RELIABILITY	0.90						
MEAN	186.7	49.0	0.07	0.19	1.00	0.3	1.08
0.2							
S.D	85.6	0.0	0.01	0.04	0.18	2.3	0.44
2.3							
REAL RMSE	0.09						
ADJ. SD	0.34						
SEPERATION	5.23						
ITEM RELIABILITY	0.93						

To establish the construct validity of the academic self-efficacy scale, McDonald's Omega and composite reliability (CR) were utilized. The analysis revealed that the values of McDonald's Omega and CR fell within the range of 0.88-0.94 and 0.89-0.94, respectively. These values align with the recommended threshold (>0.7), indicating a high level of internal consistency for the scale. These findings provide strong evidence for the reliability and robustness of the academic self-efficacy scale, suggesting that the scale consistently measures the intended construct and produces reliable results.

5. Findings

The average scores for the sample of gifted students on the academic self-efficacy instrument and the instrument of distance learning self-efficacy in its various dimensions are presented in Table 5. Notably, the average total score was found to be considerably high among the gifted student sample. These findings suggest that the gifted students in the study demonstrated a strong sense of academic self-efficacy and displayed high levels of academic competency in the context of distance learning. The results indicate that these students possess a high degree of confidence in their abilities to succeed academically and exhibit competence across various dimensions related to distance learning.

Table 5. Arithmetic means and standard deviation for academic Self-Efficacy Scale and Self-efficacy scale for distance learning and its dimensions

Self-efficacy scales	N	Mean	Std. Deviation
Communication and Interaction (CI)	210	3.78	.893
Feedback (F)	210	3.86	.895
Social Impact (SI)	210	3.88	.805
Learner Motivation and Attitude (LMA)	210	4.01	.788
Instructional Knowledge and Experience (IKE)	210	3.91	.814
Self-efficacy scale for distance learning (SEDL)	210	3.88	.785
Academic self-efficacy scale (ASE)	210	3.87	.885

The study utilized structural equation modeling (SEM) implemented with the AMOS program to address how distance learning self efficacy impacts the academic self efficacy of undergraduate students. This analytical approach allowed for a comprehensive examination of the relationships between distance learning self-efficacy and academic self-efficacy within the proposed path model. Figure 2 presents the path model, which represents the hypothesized connections between distance learning self-efficacy and academic self-efficacy among gifted undergraduate students. The path model illustrates how distance-learning self-

efficacy directly influences academic self-efficacy.

The findings obtained from the analysis of the path model indicate a significant and positive direct influence of distance learning self-efficacy on academic self-efficacy among gifted undergraduate students, with an effect rate of 0.70. This suggests that as distance learning self-efficacy increases, there is a corresponding increase in academic self-efficacy among gifted students. The observed effect rate of 0.70 indicates a substantial influence of distance learning self-efficacy on academic self-efficacy, underscoring the importance of nurturing students' confidence and perceived competence in online learning environments to enhance their academic performance and achievements.

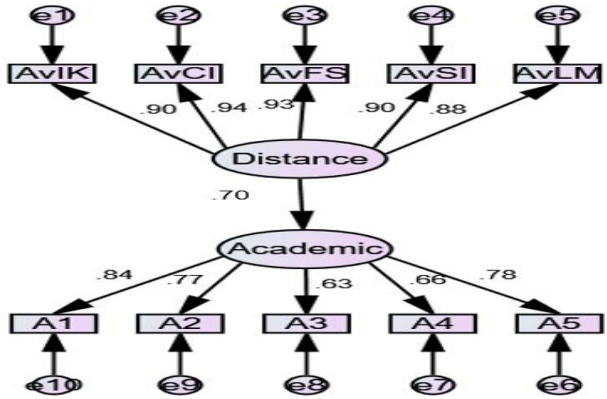

Figure 2 The proposed path model using structural equation modeling (SEM).

The second research question of this study aims to investigate the impact of online or distance learning self-efficacy factors, including Experience and knowledge in teaching, Engagement (Communication and interaction), providing feedback, Influencing society, and lastly, Encouraging learner motivation and attitude, on academic self-efficacy among gifted university students.

To evaluate the validity and reliability of the proposed path model, this research employed structural equation modeling (SEM). This statistical technique allows for a comprehensive analysis of the relationships between distance learning self-efficacy factors and academic self-efficacy among gifted undergraduate students.

The path model, presented in Figures (3-7), illustrates the hypothesized connections between each of the distance learning self-efficacy factors and academic self-efficacy. Each figure represents a specific distance learning self-efficacy factor, such as Experience and knowledge in teaching, Engagement (Communication and interaction), providing feedback, Influencing society, and lastly, Encouraging learner motivation and attitude. The path model visually depicts the direct and indirect effects of these factors on academic self-efficacy, considering potential mediating variables and underlying mechanisms.

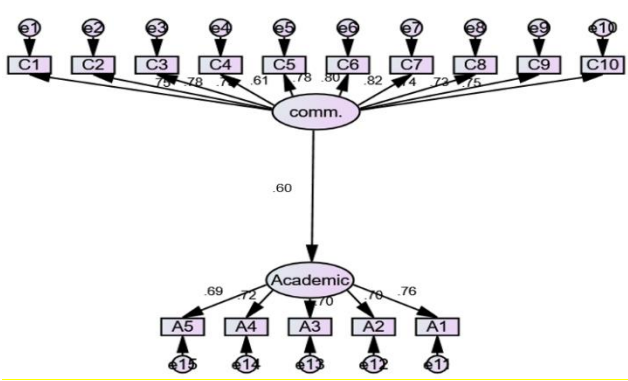

Figure 3. The proposed path model for CI and ASE

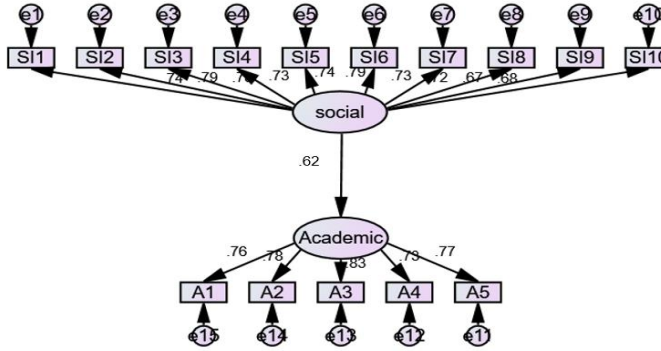

Figure 4. The proposed path model for SI and ASE

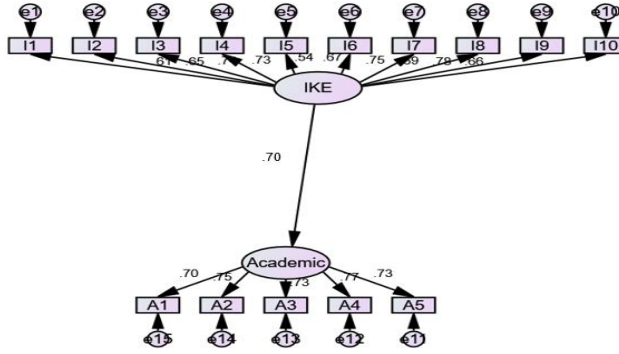

Figure 5. The proposed path model for IKE and ASE

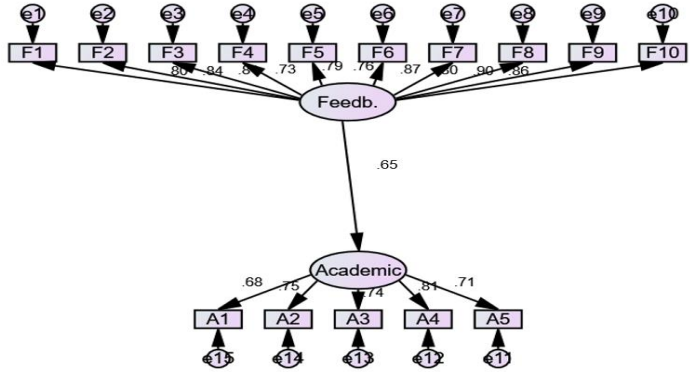

Figure 6. The proposed path model for F and ASE

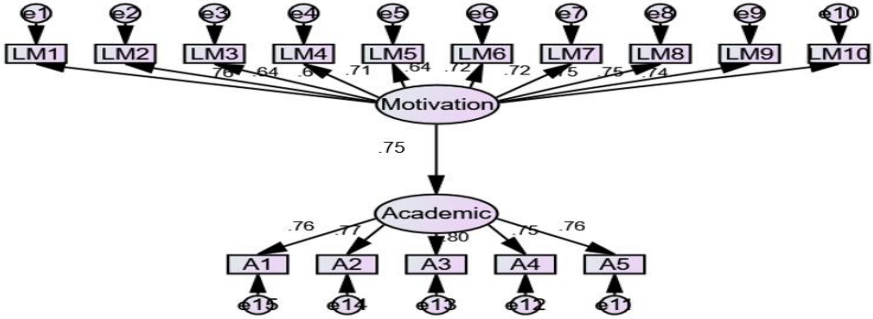

Figure 7. The proposed path model for LMA and ASE

The findings derived from the analysis of the proposed path models, as depicted in Figures 3 to 7, provide valuable insights into the relationships between specific distance learning self-efficacy factors and their impact on academic self-efficacy among gifted students.

Figure 3 demonstrates that communication and interaction for gifted students have a important direct influence on academic self-efficacy, with an effect rate of (.60). This suggests that effective communication and interaction in the context of distance learning positively contribute to the development of academic self-efficacy among gifted students.

Figure 4 further supports the positive influence of social influence on academic self-efficacy among gifted students, with the percentage of influence reaching (.62). This highlights the significance of social factors in shaping the self-perception of gifted students regarding their academic capabilities.

In Figure 5, the direct effect of knowledge and educational experience of gifted students on academic self-efficacy is evident, with the effect rate reaching (.70). This underscores the importance of prior knowledge and educational experiences in fostering a sense of competence and confidence in academic pursuits.

The impact of the feedback factor on academic self-efficacy is demonstrated in

Figure 6, where the effect rate reaches (.65). This indicates that constructive feedback, timely guidance, and constructive criticism play a pivotal role in enhancing the academic self-efficacy of gifted students.

Lastly, Figure 7 highlights the positive and direct effect of learner motivation and attitudes on academic self-efficacy, with the effect rate reaching (.75). This emphasizes the significance of intrinsic motivation, positive attitudes, and a growth mindset in influencing the perceived competence and efficacy of gifted students in academic endeavors.

Study Findings and Statistical Analyses Based on the Proposed Model:

The study findings, obtained through rigorous statistical analysis based on the proposed model, provide important insights into the relationships between distance learning self-efficacy, its five factors, and academic self-efficacy among gifted undergraduate students.

Figure 8 presents the comprehensive proposed model, showcasing the beneficial impacts of distance learning self-efficacy and its five factors on academic self-efficacy. This visual representation offers a clear overview of the complex relationships and their implications for gifted students' academic outcomes. The model demonstrates that distance learning self-efficacy, encompassing various skills and abilities necessary for successful engagement in online education, exerts a direct and positive influence on academic self-efficacy among gifted undergraduate students. This suggests that when gifted students have self-efficacy in distance learning, they tend to perceive themselves as competent and capable of achieving academic success. Furthermore, the model highlights the significance of the five factors that contribute to distance learning self-efficacy: Experience and knowledge in teaching, Engagement (Communication and interaction), providing feedback, Influencing society, and lastly, Encouraging learner motivation and attitude. Each of these factors plays a crucial role in shaping gifted students' perceptions of their own abilities and their confidence in their academic pursuits.

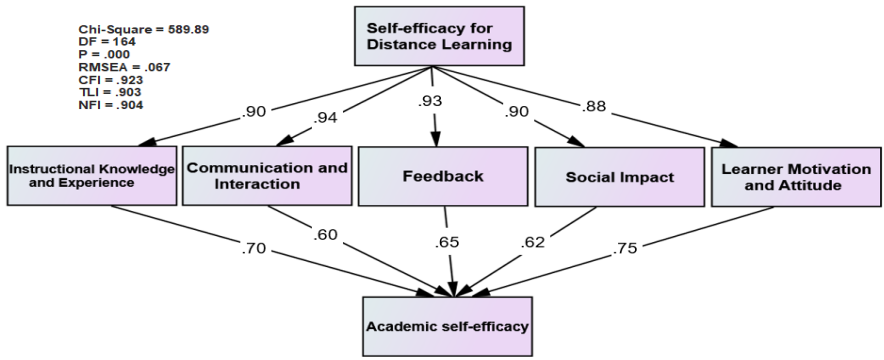

Figure 8. The Final Model Predicting and Influencing Self-Efficacy for Distance Learning and Its Factors on Academic Self-Efficacy

The adequacy of the proposed model in capturing the relationships and effects between distance learning self-efficacy, its factors, and academic self-efficacy

among gifted undergraduate students was assessed using the AMOS program. The program outlines specific fit indices that need to be tested to evaluate the effectiveness of the proposed model. The fit indices considered for verification include the comparative fit index (CFI), Normative Fit Index (NFI), and the incremental fit index (IFI). For these indices, values greater than 0.90 are generally deemed acceptable. Furthermore, the root mean square error of approximation (RMSEA) should not exceed 0.08, and a P value higher, than 0.05 is generally regarded as acceptable (Saleh & AlAli, 2024; AlAli & Al-Barakat, 2022; AlAli & Saleh, 2022). To determine the fit of the proposed model, the collected data was compared to the hypothesized model, and the results were summarized in the Table 6:

Table 6. The quality indicators of the proposed model, which tested the impacts of distance learning self-efficacy, its factors on academic self-efficacy

Name of category	Indicators of the internal construct validity	Level of acceptance	Indexes in the proposed model
Absolute fit	ChiSq	P > 0.05	Significant
	RMSE	RMSE < 0.08	.067
	CFI	CFI > 0.90	.923
Incremental fit	TLI	TLI > 0.90	.903
	NFI	NFI > 0.90	.904
Parsimonious fit	Chisq/df	Chis/df < 5.0	Chisq/df = 3.6 < 5.0

Table 6 presents the results of the fit indices, indicating the quality of the proposed model and its alignment with the assumed model using the sample data. The findings suggest a strong correspondence between the proposed model and the real world data (observed data), thereby supporting the hypothesis that distance learning self-efficacy and its factors exert a significant influence on academic self-efficacy among gifted undergraduate students.

6. Discussion

There has been an increasing interest in research and studies exploring distance learning systems in the field of education due to its widespread adoption. Undoubtedly, one of the primary factors influencing the success of these systems lies in individuals' competence and effectiveness in online learning environments. Recognizing this, the present study aims to investigate the concept of self-efficacy for distance learning and its key factors and predictors, as well as their impact on academic self-efficacy, with the goal of developing a comprehensive model. To achieve this objective, a proposed comprehensive model has been formulated, employing structural equation modeling to examine the direct and positive effects of distance learning self-efficacy and its five factors on academic self-efficacy. This model serves as a framework for understanding the intricate relationships between these variables and sheds light on their significance in fostering academic self-efficacy within the context of distance learning.

The analysis of the data revealed noteworthy findings regarding the average scores of the gifted student sample on the academic self-efficacy scale, as well as the self-efficacy scale in distance learning and its various factors. Notably, the average scores obtained by the gifted students were significantly high across these measures. These

results indicate that the gifted students in the sample displayed a strong sense of academic self-efficacy, reflecting their belief in their capabilities to succeed academically. Moreover, their self-efficacy in the context of distance learning, including its various factors, was also found to be notably high. The proposes here is that the talented students had a sense of confidence and perceived competence in engaging with online learning environments. The consistently high average scores among the gifted student sample indicate their overall positive perception of their academic abilities and their adaptability to distance learning. These findings align with previous research that has identified gifted students as having above-average self-efficacy beliefs and academic performance (Calaguas & Consunji, 2022; AlAli & Saleh, 2022; Malureanu, Panisoara & Lazar, 2021; Saefudin & Yusoff, 2021; Kundu, 2020; Ithriah, Ridwandono & Suryanto, 2020). The high average scores obtained by the gifted students highlight their potential for academic excellence and their capacity to thrive in distance learning settings. These results contribute to our understanding of the unique characteristics and strengths of gifted students, emphasizing the importance of providing tailored educational opportunities and support to foster their continued success.

The findings, obtained through structural equation modeling (SEM), revealed a significant and positive direct effect of distance learning self-efficacy on academic self-efficacy among this specific group of students. The observed effect rate of 0.70 suggests that as gifted students' self-efficacy in distance learning increases, their academic self-efficacy also experiences a corresponding boost. This finding aligns with previous research that has identified the importance of self-efficacy beliefs in predicting academic performance and outcomes (Wu, 2023; Tang, Tseng, and Tang, 2022; Ali, 2021). The results highlight the crucial role of distance learning self-efficacy in shaping the academic self-perception and achievements of gifted undergraduate students. As gifted students possess above-average abilities and potential, fostering their confidence and perceived competence in online learning environments becomes particularly significant. By empowering gifted students with high levels of distance learning self-efficacy, educators and policymakers can enhance their academic engagement, motivation, and success in distance learning settings.

The findings of the study indicate that communication and interaction play a crucial role in influencing the academic self-efficacy of gifted students. This result highlights the significance of effective communication and meaningful interaction in fostering and enhancing gifted students' confidence and perceived competence in academic pursuits. The positive and significant relationship between communication, interaction, and academic self-efficacy aligns with previous research that emphasizes the importance of social and collaborative learning environments for educational outcomes. Gifted students, who often possess advanced abilities and potential, can particularly benefit from opportunities to engage in meaningful communication and interaction with peers, instructors, and mentors (Aziz, Azizah & Rifa'i, 2024; Gebresilase and Zhao, 2023; Erozkan's, 2013). Effective communication and interaction provide gifted students with valuable platforms for exchanging ideas, receiving feedback, and engaging in intellectually stimulating discussions. By actively participating in communication and interaction, gifted students can

strengthen their academic self-efficacy beliefs, which, in turn, positively influence their motivation, engagement, and academic performance. The observed effect rate of 0.60 suggests a substantial direct impact of communication and interaction on academic self-efficacy among gifted students. This finding underscores the need for educational institutions and educators to create supportive and inclusive learning environments that foster collaboration, discussion, and interpersonal connections. By nurturing effective communication and interaction channels, educators can help gifted students build confidence, develop a sense of belonging, and maximize their academic potential.

Social influence refers to the impact of social interactions, such as peer feedback, support from teachers, and recognition from parents or mentors, on an individual's thoughts, feelings, and behaviors. In the context of academic self-efficacy, social influence can come from various sources, including classmates, teachers, family members, and even societal expectations. The finding of a significant influence of social influence on academic self-efficacy suggests that the feedback, encouragement, and support received from others can have a profound effect on individuals' beliefs about their academic capabilities. Positive social interactions, such as constructive feedback, praise, and role modeling, can enhance individuals' confidence and belief in their ability to succeed academically. Conversely, negative social interactions, such as criticism or discouragement, can undermine individuals' self-efficacy beliefs and hinder their academic performance. This result consistence with these studies (Aziz, Azizah & Rifa'i, 2024; Meng & Zhang, 2023). The influence of social influence on academic self-efficacy can be understood through Bandura's social cognitive theory, which posits that individuals' beliefs about their capabilities are shaped by observing and interacting with others. According to this theory, individuals develop self-efficacy beliefs through a process of social modeling, where they observe and learn from the experiences and accomplishments of others. The result underscores the importance of creating a supportive and positive social environment within educational settings. Teachers, parents, and peers can play a vital role in fostering a sense of competence and belief in students' academic abilities through their words, actions, and feedback. By providing constructive feedback, recognizing students' achievements, and offering support, educators and significant others can contribute to the development and maintenance of high academic self-efficacy beliefs.

The result indicating the effect of knowledge and educational experience of students on academic self-efficacy highlights the crucial role that knowledge acquisition and educational experiences play in shaping individuals' beliefs about their academic capabilities and their confidence in performing academic tasks. The finding of an effect of knowledge and educational experience on academic self-efficacy suggests that the depth and breadth of individuals' knowledge and the quality of their educational experiences significantly influence their beliefs about their academic abilities. As individuals acquire more knowledge and engage in meaningful educational experiences, their self-efficacy beliefs regarding their academic competence tend to increase. This result aligns with Bandura's social cognitive theory, which emphasizes the importance of mastery experiences in the development of self-efficacy. When individuals successfully acquire knowledge, master academic

tasks, and engage in positive educational experiences, they are more likely to develop a sense of competence and belief in their ability to perform well academically.

The finding of an impact of the feedback factor on academic self-efficacy suggests that the quality and nature of feedback received can have a profound effect on individuals' beliefs in their academic capabilities. Positive and constructive feedback that acknowledges efforts, highlights achievements, and provides specific guidance on areas for improvement can enhance individuals' confidence and belief in their ability to succeed academically. According to Bandura's social cognitive theory, feedback is a critical component of the social modeling process through which individuals develop self-efficacy beliefs. Positive feedback and reinforcement serve as sources of social persuasion, influencing individuals' perceptions of their abilities and fostering a sense of competence. Constructive feedback, on the other hand, provides guidance for skill development and improvement, helping individuals refine their academic strategies and boost their self-efficacy. This result also consistence with this studies (Johannes & Haase, 2022). The impact of feedback on academic self-efficacy can be further understood through the lens of cognitive appraisal theory. Feedback serves as an important source of information that individuals use to evaluate their performance and competence. Positive feedback enhances individuals' positive appraisals of their abilities, while constructive feedback prompts individuals to appraise their deficiencies as opportunities for growth and improvement.

The finding of an effect of learner motivation and attitudes on academic self-efficacy suggests that individuals' levels of motivation and their positive attitudes towards learning significantly influence their beliefs about their academic abilities. When individuals are highly motivated, have a positive mindset, and believe in the value and importance of their educational pursuits, they are more likely to develop and maintain strong academic self-efficacy beliefs. Motivation plays a central role in Bandura's social cognitive theory, as it is one of the key factors that influence individuals' self-efficacy beliefs. Motivation serves as a driving force that fuels individuals' efforts, persistence, and engagement in academic tasks. When individuals are motivated, they are more likely to set challenging goals, exert effort, and persevere in the face of obstacles, leading to increased self-efficacy beliefs. Attitudes towards learning also contribute to academic self-efficacy. Positive attitudes, such as believing in the relevance and importance of education, valuing learning as a means for personal growth, and having confidence in one's ability to learn, can enhance individuals' sense of competence and belief in their academic abilities. On the other hand, negative attitudes, such as a lack of interest, low value placed on education, or a belief that one is not capable of succeeding academically, can undermine self-efficacy beliefs. Educators have an impact fostering learner motivation and cultivating positive attitudes towards learning. They can create a supportive and engaging learning environment that promotes intrinsic motivation by providing opportunities for autonomy, competence, and relatedness. By offering meaningful and challenging academic tasks, allowing students to have a voice and choice in their learning, and creating a sense of belonging and connection, educators can enhance students' motivation and attitudes towards learning, thereby positively impacting their academic self-efficacy.

7. Recommendations and future directions

The beneficial impact of distance learning self confidence and different elements on the self confidence of students implies some key suggestions to consider; First and foremost is the importance of boosting the confidence of talented students, in distance learning through offering them adequate assistance and guidance in utilizing technology effectively; this may involve clear instructions on using online educational tools and platforms as well as chances for practical application and improvement. Encouraging communication and collaboration, among students is also crucial. Fostering teamwork and communication, among students using platforms or online activities can help them feel connected and engaged intellectually. Encouraging conversations and idea sharing can boost their confidence in academics. Building an supportive space for gifted students to interact with minded peers is essential, for their growth and development. Establishment of mentorship initiatives or digital academic groups and forums can offer avenues for students to interact with mentors or peers and actively participate in dialogues. These social interactions can play a role, in boosting their confidence in academics. In addition, to this successfully nurturing the self-efficacy of students involves delivering challenging and intellectually stimulating educational activities that align with their capabilities and passions. Encouraging students to explore research projects and creative endeavors can help them deepen their interests and boost their expertise and self assurance levels significantly. Moreover; ensuring that feedback, in online learning settings is tailored effectively is crucial for supporting learners. Providing feedback that's both detailed and encouraging. Recognizing students' strengths while also pinpointing areas for enhancement and providing actionable advice for progress. Remains a key element, in nurturing their growth and development. Creating an environment where feedback is valued and seen as a way to enhance growth can inspire students to believe in their potential, for continual improvement and development of a growth mindset. Moreover fostering motivation and fostering an outlook on learning are essential aspects. Developing activities that cater to the interests, curiosity and intellectual hunger of students is vital, in stoking their motivation. Acknowledging and appreciating their achievements while highlighting the significance of work and determination and relating their education to situations and future aspirations can enhance their drive and optimistic outlook, on learning.

Future Areas, for Study; There is room for research to delve into the ways in which various factors (communication and interaction dynamics, social impact, educational background and experience receiving feedback motivation levels and attitudes) impact the confidence levels of academically gifted students participating in remote learning environments. It would be beneficial to examine how these factors interact with each other and determine their varying significance, in forecasting self confidence results. Long term investigations can offer insights, into how distance learning self confidence and related factors impact the success and overall well being of gifted students.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki and approved by the ethics committee of King Faisal University, protocol code ERS_2022_6206. The date of approval was 23 October 2023.

Informed Consent Statement: Informed consent was obtained from all the individual participants

included in the study.

Data Availability Statement: The data supporting the findings and conclusions are available upon

request from the corresponding author.

Acknowledgments: We thank the Deanship of Scientific Research at King Faisal University for providing financial support to this research. We also would like to thank all the students who participated in this study for their time and valuable contributions.

Funding

This work was financially supported by the Deanship of Scientific Research, King Faisal University, Saudi Arabia [Grant No. KFU242457].

Conflicts of Interest: The authors declare no conflicts of interest

References

Aguilera-Hermida, A. P., Quiroga-Garza, A., Gomez-Mendoza, S., Villanueva, C. A. D. R., Alecchi, B. A., & Avci, D. (2021). Comparison of students' use and acceptance of emergency online learning due to COVID-19 in the USA, Mexico, Peru, and Turkey. Education and Information Technologies, 1-23. https://doi.org/10.1007/s10639-021-10473-8

AlAli, R. & Saleh, S. (2023). The efficiency of the distance learning system and contributions of behavioral practices to motivation and passion for research in metacognition in its prediction. International journal of learning and change, 15(6). https://doi.org/10.1504/IJLC.2023.134544

AlAli, R., & Saleh, S. (2022). Towards constructing and developing a self-efficacy scale for distance learning and verifying the psychometric properties. Sustainability, 14(20), 13212. https://doi.org/10.3390/su142013212

AlAli, R.; Al-Barakat, A. (2022). Using Structural Equation Modeling to Assess a Model for Measuring Creative Teaching Perceptions and Practices in Higher Education. Educ.Sci., 12, 690. https://doi.org/10.3390/educsci12100690

Ali, S. (2021). E-Learners' Self-Efficacy for Online Courses: Self-Efficacy for It Use as a Predictor for Academic Self-Efficacy. Pakistan Journal of Distance and Online Learning, 7(2), 87-104. https://eric.ed.gov/?id=EJ1335391

Al-Barakat, A. A., Al Ali, R. M., & Al-Hassan, O. M. (2022). Supervisory Performance of Cooperative Teachers in Improving the Professional Preparation of Student Teachers. International Journal of Learning, Teaching and Educational Research, 21(8). https://doi.org/10.26803/ijlter.21.8.24

Alqurashi, E. (2016). Self-efficacy in online learning environments: A literature review. Contemporary Issues in Education Research (CIER), 9(1), 45-52. https://doi.org/10.19030/cier.v9i1.9549

Amri, Z., & Alasmari, N. (2021). Self-Efficacy of Saudi English Majors after the Emergent Transition to Online Learning and Online Assessment during the COVID-19 Pandemic. International Journal of Higher Education, 10(3), 127–137. https://files.eric.ed.gov/fulltext/EJ1299937.pdf

Aziz, A., Azizah, F. N., & Rifa'i, A. (2024). The Influence of Academic Self-Efficacy, Social

Support, and Supervisor Interpersonal Communication on Student Thesis Completing Motivation. Indonesian Interdisciplinary Journal of Sharia Economics (IIJSE), 7(1), 929-944. https://e-journal.uac.ac.id/index.php/iijse/article/view/3769

Bandura, A. (2010). Self-Efficacy. The Corsini Encyclopedia of Psychology. https://doi.org/10.1002/9780470479216.corpsy0836

Baticulon, R. E., Sy, J. J., Alberto, N. R. I., Baron, M. B. C., Mabulay, R. E. C., Rizada, L. G. T., et al. (2021). Barriers to online learning in the time of COVID-19: A national survey of medical students in the Philippines. Medical science educator, 31(2), 615–626. https://doi.org/10.1007/s40670-021-01231-z

Broadbent, J. (2016). Academic success is about self-efficacy rather than frequency of use of the learning management system. Australasian Journal of Educational Technology, 32(4), https://doi.org/10.14742/ajet.2634

Calaguas, N. P., & Consunji, P. M. P. (2022). A structural equation model predicting adults' online learning self-efficacy. Education and Information Technologies, 27(5), 6233-6249. https://doi.org/10.1007/s10639-021-10871-y

Cazan, A. M., Cocoradă, E., & Maican, C. I. (2016). Computer anxiety and attitudes towards the computer and the internet with Romanian high-school and university students. Computers in Human Behavior, 55, 258–267. https://doi.org/10.1016/j.chb.2015.09.001

Chen, I. S. (2017). Computer self-efficacy, learning performance, and the mediating role of learning engagement. Computers in Human Behavior, 72, 362–370. https://doi.org/10.1016/j.chb.2017.02.059

Clark, M. (2017). Imposed-inquiry information-seeking self-efficacy and performance of college students: A review of the literature. The Journal of Academic Librarianship, 43(5), 417–422. https://doi.org/10.1016/j.acalib.2017.05.001

Erozkan, A. (2013). The effect of communication skills and interpersonal problem solving skills on social self-efficacy. Educational Sciences: Theory and Practice, 13(2), 739-745. https://eric.ed.gov/?id=EJ1017303

Ferdousi, B. (2019). The Effect of Computer Self-Efficacy and Attitude on Undergraduate Students' Intention to Use Emerging Technology in Classroom Learning. Journal of Computer Sciences and Applications, 7(1), 50–55. http://article.computersciencesapplications.com/pdf/JCSA-7-1-8.pdf

Gebresilase, B. M., & Zhao, W. (2023). Academic self-efficacy mediates the relationship between Student teacher interaction and students university Academic achievement in Ethiopia. Research Square, 1-17. https://doi.org/10.21203/rs.3.rs-2689584/v1

Hayashi, A., Chen, C., Ryan, T., & Wu, J. (2020). The role of social presence and moderating role of computer self-efficacy in predicting the continuance usage of e-learning systems. Journal of Information Systems Education, 15(2), 5. https://aisel.aisnet.org/jise/vol15/iss2/5

Honicke, T., & Broadbent, J. (2016). The influence of academic self-efficacy on academic performance: A systematic review. Educational research review, 17, 63-84. https://doi.org/10.1016/j.edurev.2015.11.002

Ithriah, S. A., Ridwandono, D., & Suryanto, T. L. M. (2020, July). Online learning self-efficacy: The role in e-learning success. In Journal of Physics: Conference Series (Vol. 1569, No. 2, p. 022053). IOP Publishing. https://doi.org/10.1088/1742-6596/1569/2/022053

Johannes, C., & Haase, A. (2022). The impact of feedback mode on learning gain and self-efficacy: A quasi-experimental study. Active Learning in Higher Education, https://doi.org/10.1177/14697874221131970

Kundu, A. (2020). Toward a framework for strengthening participants' self-efficacy in online education. Asian Association of Open Universities Journal, 15(3), 351-370. https://doi.org/10.1108/AAOUJ-06-2020-0039

Lee, J. K., & Hwang, C. Y. (2007) The effects of computer self-efficacy and learning management system quality on e-Learner's satisfaction. In Proceedings of the 2007

European LAMS Conference: Designing the future of learning (pp. 73-79). https://www.lamsfoundation.org/lams2007/pdfs/Lee_Hwang_LAMS2007.pdf.

Lim, K., Kang, M., & Park, S. Y. (2016). Structural relationships of environments, individuals, and learning outcomes in Korean online university settings. International Review of Research in Open and Distributed Learning, 17(4), 315-330. https://doi.org/10.19173/irrodl.v17i4.2500

Malureanu, A., Panisoara, G., & Lazar, I. (2021). The relationship between self-confidence, self-efficacy, grit, usefulness, and ease of use of elearning platforms in corporate training during the COVID-19 pandemic. Sustainability, 13(12), 6633. https://doi.org/10.3390/su13126633

Martin, F., Tutty, J. I., & Su, Y. (2010). Influence of Learning Management Systems Self-Efficacy on E-Learning Performance. Journal on School Educational Technology, 5(3), 26–35 https://files.eric.ed.gov/fulltext/EJ1102894.pdf

Meng, Q., & Zhang, Q. (2023). The Influence of Academic Self-Efficacy on University Students' Academic Performance: The Mediating Effect of Academic Engagement. Sustainability, 15(7), 5767. https://doi.org/10.3390/su15075767

Mohamed, N., & Karim, N. S. A. (2012). Computer Application Anxiety, Self-Efficacy, and Open Source Learning Management System Acceptance. In Proceedings of the 12th WSEAS International Conference on Applied Computer Science, Singapore: WSEAS Press (pp. 274-278). http://www.wseas.us/e-libra ry/conferences/2012/Singa pore/ACCIDS/ACCIDS-45.pdf.

Nielsen, T., Dammeyer, J., Vang, M. L., & Makransky, G. (2018). Gender fairness in self-efficacy? A Rasch-based validity study of the General Academic Self-efficacy scale (GASE). Scandinavian Journal of Educational Research, 62(5), 664–681. https://doi.org/10.1080/00313831.2017.1306796

Peechapol, C., Na-Songkhla, J., Sujiva, S., & Luangsodsai, A. (2018). An exploration of factors influencing self-efficacy in online learning: A systematic review. International Journal of Emerging Technologies in Learning (iJET), 13(09), 64–86. https://2u.pw/2tjagCB

Prior, D. D., Mazanov, J., Meacheam, D., Heaslip, G., & Hanson, J. (2016). Attitude, digital literacy, and self-efficacy: Flow-on effects for online learning behavior. The Internet and Higher Education, 29, 91–97. https://doi.org/10.1016/j.iheduc.2016.01.001

Reychav, I., Ndicu, M., & Wu, D. (2016). Leveraging social networks in the adoption of mobile technologies for collaboration. Computers in Human Behavior, 58, 443-453. https://doi.org/10.1016/j.chb.2016.01.011

Saefudin, W., & Yusoff, S. (2021). Self-efficacy and student engagement in online learning during pandemic. Global Journal of Educational Research and Management, 1(4), 219-231. https://linksshortcut.com/ubJwW

Saleh, S., & AlAli, R. (2022). Digital Learning Tools (Institutional-Open) and Their Relationship to Educational Self-Effectiveness and Achievement in Online Learning Environments. Social Space, 22(3), 226-256. https://socialspacejournal.eu/menu-script/index.php/ssj/article/view/128

Saleh, S., & AlAli, R. (2024). Constructing and development of the psycho-computing traits scale: a psychometric analysis of computer users and students in the field of computer science. Cogent Social Sciences, 10(1), 2344231. https://doi.org/10.1080/23311886.2024.2344231

Schlebusch, C. L. (2018). Computer anxiety, computer self-efficacy, and attitudes towards the internet of first-year students at a South African University of Technology. Africa Education Review, 15(3), 72–90. https://doi.org/10.1080/18146627.2017.1341291

Tang, Y., Tseng, H., & Tang, X. (2022). The impact of information-seeking self-efficacy and online learning self-efficacy on students' performance proficiency. The Journal of Academic Librarianship, 48(5), 102584. https://doi.org/10.1016/j.acalib.2022.102584

Tsai, M. J., Wang, C. Y., & Hsu, P. F. (2019). Developing the computer programming self-

efficacy scale for computer literacy education. Journal of Educational Computing Research, 56(8), 1345-1360. https://doi.org/10.1177/0735633117746747

Wu, R. (2023). The relationship between online learning self-efficacy, informal digital learning of English, and student engagement in online classes: the mediating role of social presence. Frontiers in Psychology, 14, 1266009. https://doi.org/10.3389/fpsyg.2023.1266009

Yavuzalp, N., & Bahcivan, E. (2020). The online learning self-efficacy scale: Its adaptation into Turkish and interpretation according to various variables. Turkish Online Journal of Distance Education, 21(1), 31-44. https://doi.org/10.17718/tojde.674388

Zimmerman, W. A., & Kulikowich, J. M. (2016). Online Learning Self-Efficacy in Students With and Without Online Learning Experience. American Journal of Distance Education, 30(3), 180–191. https://doi.org/10.1080/08923647.2016.1193801