

# The Perceptions of Academic Leaders for the Twenty-First Century Skills Necessary for Higher Education Students in Light of the Knowledge Society Requirements

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**Abstract:** The study aimed to identify the perceptions of academic leaders for the twenty-first century skills necessary for higher education students in light of the knowledge society requirements. To achieve the objectives of the study, the researcher used the descriptive analytical method, and a study tool that was prepared and verified for its validity and reliability. The study sample consisted of (224) academic leaders of Saudi official universities in the Saudi capital Riyadh. The results of the study showed that the perceptions of the study sample for the 21st century skills necessary for higher education students was high. The results of the study also showed that the degree of compatibility of higher education programs and practices with the 21st century skills was medium. The results of the study also indicated that there were no statistically significant differences at ( $\alpha \leq 0.05$ ) to estimate the study sample of the twenty-first century skills necessary for higher education students due to the variables (academic specialization, academic rank, job position). The study recommended the need to formulate and adopt a renewable vision of universities based on the reality, needs, and philosophy of the society, and the development of curricula to be compatible with the 21st century skills necessary for higher education students.

**Keywords:** Academic Leaders, Twenty-First Century Skills, Higher Education, Knowledge Society.

## 1 Introduction

In a world filled with rapid transformations and changes, in which knowledge has become an essential element of the human industry, the greatest challenge lies in the educational systems responding to these transformations. By focusing on developing its outputs based on the skills of the twenty-first century, and preparing individuals with academic and life skills, who can adapt, compete, and face challenges. Since higher education institutions have the responsibility to respond quickly to these transformations, to achieve sustainable development, it faces many challenges today regarding the issues of technological, political, and social development, globalization and its entanglements, competitiveness and its requirements, the knowledge economy and its effects, the accumulation of information and its secretions, and the communication revolution and its complexities, all of which require these institutions today to play critical roles in the change and transformation of (Transfer of education model) to the era of knowledge model (transformational model).

Khan and others (Khan et al., 2019) believe that higher education is strongly linked to economic development and prosperity in a world that is witnessing many challenges, and in light of this, higher education institutions do not have the responsibility to generate new knowledge only, but also must provide new generations with competencies and advanced skills needed to survive in the third millennium. While Barnet (Barnet, 2004) considers higher education as the indispensable investment capital to achieve sustainable development. Similarly, Mughal & Manzoor (1999) see that the responsibilities of higher education institutions lie in providing their students with the knowledge, experience, and skills necessary for the future. And according to Moore and Farris (Moore & Farris, 1991), the purpose and functions of higher education institutions are not only to import knowledge, but there is a deeper purpose. Rather, there is a deeper and more multidimensional purpose, which lies in personal, social, cultural, and economic development. Haider (Haider, 2008) suggested that higher education institutions should respond to the demands of society and global challenges, moreover, these institutions should meet the increasing demands of higher education students.

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Proceeding the rapid developments in the fields of science and technology, the information and communication revolution, open world, the growing role of intelligence and innovation, the decline in the role and feasibility of preservation and retrieval of attention, and in response to the accelerating demands of the labor market and facing the challenges imposed by the successive social and economic changes; to provide a better life. The need to provide today's generations in higher education institutions with the necessary knowledge and skills to meet these challenges has increased (Boholanom, 2017). This necessitates institutions to rearrange their priorities, and prepare specific frameworks such as: global awareness, economics, calculated risk, and visual culture, with the aim of emphasizing higher skills, modern technology, and communication in a direction to link education with life and work skills (Robinson et al., 2015). Educators, academics, and investment leaders unanimously agreed on the urgent need to prepare a generation with twenty-first century skills (Lynch et al., 2018). This need demanded a change from the focus on content-oriented higher education to the focus on and enhanced learning methods and processes, which is within what the contexts of the twenty-first century require (Zanartu et al., 2015). This also requires changing the roles of learners from passive recipients to positive, active, interactive learners equipped with critical thinking skills, teamwork spirit and creativity, communication, and innovation (Al-Hariri, 2020). Robinson et al., 2015). To be able to prepare generations to keep pace with change, and to fit the needs of the labor market in the era of the digital economy, it is necessary to inculcate the appropriate competencies for the current era, and these competencies can be obtained through the skills of the twenty-first century (Stehle & Peters-Burton, 2019).

Twenty-First Century Skills represent not only a framework for teaching and learning, but also for life and work (Lynch et al., 2018). The current century is characterized by global competitiveness, and from this standpoint, it has become necessary to have highly qualified citizens who possess these skills. Ross (Ross, 2018), CEO of the partnership for twenty-first century education, pointed out in his article "Why the 4Cs Will Be the Foundation of the Human Interface" that the individual needs four basic skills to succeed in life and work, and he called them (4Cs), which are cooperation, Communication, creativity, critical thinking skills and problem solving, and digital thinking is added to become (5Cs) (Hernandez, 2017; Grover, 2018). Weismath and others, (Weismath et al, 2014) argued about the importance of raising higher education students' awareness of the importance of problem-solving skills in Their scientific specializations, as one of the most important basic elements in the comprehensive education of students of the twenty-first century. Loewecke (Loewecke, 2015) believes that global competence is related to strengthening the twenty-first century skills of learners through what is known as global learning, which aims to

develop problem-solving and critical thinking skills, communication skills and cooperation, as well as innovative skills. International projects confirm the need to help students acquire them. From this standpoint, strengthening these skills among faculty members can help in strengthening them among students (Cetin & Kulluca, 2014).

Higher education institutions all over the world seek to remain in the spotlight and attention, and to search for competitive advantages through their interest in the skills of the twenty-first century, which play an important role in reducing the gap between educational outcomes and labor market requirements and providing students with the knowledge and skills necessary for future jobs, Al-Hariri, Al-Hariri, 2020). These skills play a major role in preparing individuals to face rapid changes and prepare them towards a future full of innovations, discoveries, and unfamiliar technologies (bin Zaed, 2021). In addition, the acquisition of these skills by higher education students increases the chances of their ability to overcome the various challenges of the era, which they may face in their scientific and practical lives, and its role in building their personalities (Klein & Moore, 2016). With the increasing need for skills and the development experienced by societies, and due to the pioneering transformations and noticeable changes in the twenty-first century, the development of the educational system has become a crucial necessity in all educational institutions (David et al., 2003). Ehlers & Kellerman's study (Ehlers & Kellerman, 2019) aimed at to identify how higher education institutions prepare to set future graduates and showed the importance of future skills in the twenty-first century to face changes in the labor market and global and technological challenges. However, most studies are limited to identifying the effects of technological developments, skills development requirements and labor market changes, and they often limit future skills exclusively to digital skills, which despite its importance it represents only one aspect of future skills (Utomo et al., 2017).

Several attempts have been made recently to show the importance of enhancing the learning of twenty-first century skills, including what was emphasized in Sahin's study (Sahin, 2009) the need for learners to master problem-solving skills, decision-making, and taking responsibility. The results of Pheeraphan (Pheeraphan, 2013) study showed the positive impact of integrating twenty-first century skills in education, especially Information and Communication Technology skills. Which had a prominent role in enhancing students' learning and increasing their informational enrichment. In a Finnish study conducted by Ahonen & Kinnunen (Ahonen & Kinnunen, 2015), social skills were among the most important skills that require reinforcement and are the most prominent in terms of students' interest. In a Thai study aimed at developing and evaluating the skills of the twenty-

first century, conducted by Ongardwanich and others (Ongardwanich et al., 2015) it was found that life and professional skills, along with their sub-skills, are the most important for future success. As for the Kan and Murat study (Kan & Murat, 2018), the faculty members strongly agreed on the importance of enhancing and consolidating learning and innovation skills, life skills, and technical skills in the hearts of students to benefit from them in their career. While the results of the Gut study (Gut, 2011) emphasized the importance of integrating these skills into the educational content and provided examples of educational lessons that incorporated these skills. Many studies indicated that those who address the teaching profession in higher education institutions lack mastery of twenty-first century skills (Valli et al, 2014). Looking at the preparation programs, we find that there is no systematic approach to teaching these skills to prepare future teachers (Shelbie & Don, 2015). Nor is there an intentional effort by higher education to strengthen the framework for these skills (Partnership for Twenty-First Century Skills, 2010). The focus on gaining content knowledge disoriented the focus on developing twenty-first century skills. In fact, this trend aligns with the overall vision of education in the world, which calls for the integration and teaching of skills within the core courses of any field. Al-Hariri (Hariri, 2020) discussed that reports around the world confirm that the skills gap of the twenty-first century costs jobs and companies huge sums as a result of employing people who are less qualified than the demand level, and who are qualified according to the required skills. As this matter threatens the global economy, there is a dire need for highly qualified employees equipped with the necessary skills (Tilling & fadel, 2009)). Despite this, previous studies did not show a noticeable interest in it within the framework of higher education, in light of global and digital transformations and in light of the requirements of the knowledge society, especially the theoretical literature related to higher education, as some studies neglected the academic leaders' vision and perceptions of the necessary skills for students in the twenty-first century, and in light of the requirements of the knowledge society (Songkram et al., 2019; Alamri, 2021). Considering the discussion mentioned above, we may conclude that higher education institutions today need to equip their students with specialized skills. So that they can survive the third millennium, and this can be done by providing students in higher education with twenty-first century skills to meet the demands of a knowledge economy (Oudeweetering & Voogt, 2018).

This study, along with previous studies, will contribute to bridging the previously mentioned gap by knowing the necessary skills for higher education students from the point of view of academic leaders considering the requirements of the knowledge society, and to what extent current programs and practices in higher education institutions are compatible with the skills of the twenty-first century, and to provide a modern vision for those skills in

higher education. and studying the differences in academic leaders' estimates of the necessary skills for students of higher education in the twenty-first century due to the variables of the study, and this would reveal correlational relationships that have not been addressed before, providing an implementable frame of reference for all practitioners and academic leaders.

## 2 Background and hypotheses development

Twenty-first century skills are an important factor in the success of institutions, achieving competitive advantage, and building a strong social economy. They face a dynamic environment characterized by rapid technological changes and the requirements of globalization. Therefore; Velez (Velez, 2012), argued that higher education institutions need to change their roles, to motivate their students, to find solutions to problems that have not been encountered before in the curriculum, using techniques not yet discovered, working on concepts that have not yet been developed, moving to critical thinking, and collaborating to generate new ideas, to address these issues, and develop new thinking skills that support stronger problem solving (Van Laar et al., 2017). The knowledge-based economy in the current era requires higher levels of imagination, creativity, and innovation in order to discover new and distinct services and products for the global labor market (Hariri, 2020). The skills of the twenty-first century are imposed as a major factor in competitiveness (Jan, 2017). Most global policies, in their strategic plans, have attached vital importance to education based on the skills of the twenty-first century, which prompted global societies to demand that educational systems reconsider their educational outcomes so that they are skillfully qualified to keep pace with the requirements of the twenty-first century (Fadel & Trilling, 2009). However, it is noted that these skills are part of teaching in higher education institutions and are taught by chance, not as part of a comprehensive education plan (Boholanom, 2017). In fact, this trend aligns with the overall vision of education in the world, which calls for the integration and teaching of twenty-first century skills within the core courses of any field (Scott, 2015).

The term twenty-first century refers to some synonyms of future-thinking skills, knowledge skills and third millennium skills, as defined by the partnership for 21st-Century Skills as "the set of knowledge and skills important and necessary for success and work, namely: learning and innovation skills, technical and information skills, and professional and life skills". While the skills of the twenty-first century from the point of view of Bialik & Fadel (Bialik & Fadel, 2015) consists in knowing how the individual uses it in what he does. As Mattison and others (Mattison et al., 2018: 5) defined it as: "a set of comprehensive attitudes, skills, and knowledge that can be interdependent, interdisciplinary, and embedded in different life situations". Marzano and Tami (Marzano and Tami,

2017) identified them in two areas: the first: cognitive skills, which include: analyzing and using information, addressing complex problems and issues, and creating mental patterns and models, and the second: will skills, including: understanding and controlling oneself, and understanding and interacting with others. As defined by Beers (Beers, 2014) in three areas: learning and innovation skills, information, media and technology skills, and life and work skills. Trilling and Fadel (Trilling and Fadel, 2009: 75) went on to state that they are “the skills, knowledge, and experience urgently needed in the twenty-first century that students need to master for successful work and life, exemplified in learning and creativity skills, digital culture, career and life”. Shalaby (Shalaby, 2014: 3) considered them as “a set of skills necessary to ensure that learners are prepared to learn, innovate, live, work, and make optimal use of information, media and technology in the twenty-first century”. Bybee (Bybee, 2010: 129) described them as “the skills that enable students to employ the scientific knowledge they possess, without being limited to its quantity, to ensure that they engage in the labor market in the twenty-first century. Considering previous definitions of twenty-first century skills, the researchers concluded that they are “the skills that students need in higher education to be active, productive, creative and influential members, as well as their mastery of the knowledge content necessary to achieve success and excellence, in accordance with the requirements of the knowledge society and the knowledge economy of the twenty-first century”.

The trend of the twenty-first century skills is one of the trends that began to receive attention from educators, with the aim of supporting students in the university or career in terms of mastering both content and skills, and these skills began to be advocated in all disciplines by the partnership for twenty-first century skills, which has emerged as one of the leading organizations advocating reinforcing 21st century skills. It emphasized inculcating and integrating 21st century skills in education. This provides opportunities for academic leaders, the business community, and policy makers, to define an integrated vision for education in the twenty-first century; In which everyone contributes well to society as a global citizen (P21, 2009). Furthermore, the (P21) framework encourages institutions, officials as well as teachers to implement 21st century skills in educational institutions (P21, 2008). It also showed concerns that the graduates of the twenty-first century may not be prepared for this, and they offered an integrated vision of learning known as the “Twenty-first Century Learning Framework”. This framework depicts the basic skills and abilities that an individual must learn to be successful in work as well as in life. As recommended (P21, 2009), developing these skills in the classroom will enable students to transfer thinking processes to unfamiliar situations to create unconventional solutions, and to ask questions that help determine the best outcome. While it was suggested (P21, 2011) to implement

each new skill of the twenty-first century a new knowledge of basic topics and understanding among all learners. These learners, who can analyze and solve problems, ponder, and communicate efficiently. The (P21, 2009) summarized the basic skills and abilities of twenty-first century students in four contexts: student outcomes, support systems, twenty-first century topics, and academic content.

According to Silva (Silva, 2009; 631) twenty-first century skills are not new, but they are “important at the moment”, as today’s students must be able to find and analyze information from multiple sources. Long ago John Dewey also recommended future skills. He proposed an 'experience-centered' education in which students interact with a 'transforming world' (Larson & Miller, 2011). Bellanca & Brandt (Bellanca & Brandt, 2010) showed a set of foundations upon which twenty-first century skills are built: such as integrating twenty-first century skills in the context of the subjects, as well as applying skills across content topics, emphasizing a competency-based approach, providing innovative learning methods, and the adoption of learner-centered teaching. Shalaby (Shalaby, 2014) concluded that the goal of the process of integrating twenty-first century skills into the curricula is: to provide students with the necessary skills for learning and life, and to practice them effectively in life and work, and to engage with real-world environments and tools, and to teach students how to be thinkers, creative and able to Solve their individual and group problems. The importance of the twenty-first century skills in higher education from the point of view of Duran and others (Duran, et al, 2011), lies in transforming and changing the negative roles of students into roles that are more interactive with society, university, colleagues, and subjects, and thus achieving the greatest amount of desired educational goals in the behavior of students.

In response to the requirements of the twenty-first century, attention came to these skills. There are many classifications of twenty-first century skills in different cultures and societies, including: (Partnership for 21st Century Skills, 2015) According to this framework, twenty-first century skills are categorized into three main axes; To ensure students’ readiness for learning, life and work in the twenty-first century. The first is, the skills of learning, innovation, and creativity (4Cs), these are the skills that distinguish students who are prepared for increasingly complex lives and open work environments from others. The skills consist of the following competencies: creativity and innovation, critical thinking, problem solving, and cooperation and effective communication. Second: Technology, information, and media skills, in which the twenty-first century learner will be able to practice a number of functional skills and critical thinking skills that are related to information, media and technology and consist of the following competencies: information culture, media culture, technological culture, and a culture of

communication and information. And the third: life and work skills. This axis consists of the following competencies: flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility (Onggardwanich et al., 2015).

Adding to it the framework of the twenty-first century skills of the North Central Regional Educational Laboratory, which came to divide the twenty-first century skills into four main groups: digital age skills, creative thinking skills, effective communication skills, and high productivity skills. But the framework of the twenty-first century skills of The Organization for Economic Cooperation and Development divided twenty-first century skills into three main areas which are: using tools interactively, interacting in disparate groups, and acting independently. However the framework of the twenty-first century skills of The American Association of Colleges and Universities sets a framework for the specifications of the graduate in the twenty-first century in the form of the following learning outcomes: knowledge about human cultures and the natural and physical world, practical and mental skills, social and personal responsibility, and Integrative learning (Griffin & Care, 2012; Voogt & Roblin, 2012; Trilling & Fadel, 2009).

With the beginning of the twenty-first century, and the emergence of the era of globalization and informatics, and the expansion of knowledge, the systems sought to achieve a competitive advantage, by preparing their graduates, and qualifying them to safely enter the world of the knowledge economy, equipped with applied skills and innovative experiences, such as the ability to use and apply knowledge, problem solving, effective communication decision-making, creative and critical thinking, and others (Care et al., 2018); Therefore, most global policies, in their strategic plans, have attached vital importance to education based on the skills of the twenty-first century, which has prompted global societies to demand that educational systems reconsider their educational outcomes so that they are skillfully qualified to keep pace with the requirements of the twenty-first century (Trilling & Fadel, 2009). In the working paper submitted to UNESCO, Scott (Scott, 2015) stated that the skills of the twenty-first century should be an essential component of the overall vision of learning in the current century. And added that these skills are necessary to build students' knowledge, increase their ability to be productive, create, and work. Therefore, education should focus on mastering basic academic subjects and developing skills for the twenty-first century (Alismail & McGuire, 2015). And that the future skills of the twenty-first century are necessary to prepare effective citizens who are able to meet the challenges of the global community, who are able to be innovative in order to solve complex problems and use the power of technology to change the world for the better (Kivunja, 2014a). The study of Onggardwanich & others (Onggardwanich et al., 2015) showed that life and

occupational skills are the most important of the twenty-first century skills that provide students with flexibility, adaptability, initiative, self-direction, social skills, leadership, responsibility, and other life skills. Danielle and Vaskinlos (Danielle et al., 2015; Moutinho et al., 2015) stressed the need to include twenty-first century skills in the curricula, and to provide students with those skills through various study subjects, and there was a noticeable decline in the handling of twenty-first century skills in the school curricula and that the level of its inclusion has not reached the required level, and that the current curricula in general suffer from a clear shortcoming in setting up and preparing learners for life and work in the twenty-first century, and neglected its role in preparing the learner distinctly to meet the challenges of this century (Hajja, 2018; Sebhi, 2016; Shalaby, 2014). In short terms, working according to competencies, including the competencies of the twenty-first century, is not only a matter of pedagogical techniques and educational practices, as much as it is in its depth an issue of strategic choice for the future of society and its educational system; And the issue of fate for its subsequent generations and its future in this changing world (Kivunja, 2014b). Given the importance of twenty-first century skills, a strong desire has emerged to generalize their teaching at all levels of education. Because the success of individuals in life depends on their mastery of these skills, which requires the formulation of general frameworks for the skills of the twenty-first century and the basis for integrating them into the curricula; To prepare students appropriately in the age of the knowledge society (Rotherham & Willingham, 2009; Silva, 2009). Kay (Kay, 2010) indicates that the systematic and intentional integration of twenty-first century skills into education curricula would achieve multiple goals that were not achievable before: such as achievement, building confidence, innovation, leadership, and active participation in life. While Trilling and Fadel (Fadel & Trilling, 2009) see that the integration of twenty-first century skills leads to the ability to solve problems in a correct scientific manner, develop innovative solutions, participate in decision-making, and use knowledge and technology tools to continue learning for life.

In addition to the skills of the twenty-first century, we find that there is a deep gap between the level of students' cognitive skills and the cognitive requirements to access the knowledge society, which requires a review of the quality of the educational system, and an attempt to correct its direction, purposes, and practices in order to build a knowledge society (Abdulhameed, 2012). Since higher education institutions are institutions based on learning, innovation and creativity, knowledge sharing becomes a necessary practice to achieve its mission and goals (Mcinerney & Mohr, 2007). And the concept of a knowledge society is seen as "a society that uses information in all aspects of human activity, as people in this society depend on using modern technology to process and disseminate information" (Miculescu & Pribac, 2010,

91). The requirements of the knowledge society are seen as “those requirements, needs, skills, activities, and necessary roles that must be fulfilled at university, in order to prepare graduate students who are able to produce knowledge, analyze and critique it, and apply it in their practical lives, and in economic and social development” (Ibraheem, 2018, 10). With the end of the nineties of the twentieth century and the beginning of the twenty-first century, the term knowledge society began to spread, to confirm that the real goal should be to transform information into knowledge, and use it to serve humanity (Hong, 2014). The knowledge society is considered one of the latest forms of societal development witnessed by mankind, and it depends on the efficient production of information and its use in all aspects of life and its various fields (Orlanova, 2012). The knowledge society is based on three main pillars: knowledge production, knowledge employment, and knowledge dissemination (Dinu, 2012). On the other hand, dealing with the knowledge society takes place through four areas: knowledge generation, knowledge transfer, knowledge dissemination, and knowledge investment. Thus, the knowledge society, including its features that highlight its importance, advantages, and multiple benefits, and contributes to the development and advancement of societies (Steyn & Tioit, 2009). Tilak (Tilak, 2002) believes that the three most important features that distinguish the knowledge society are: creative ability, creative talents, and the extent of the ability to challenge and compete between countries cognitively. And all of this is based on quality education based on the skills of the twenty-first century. Oguz & Aydin (Oguz & Aydin, 2012) explained that the education system in the knowledge society depends mainly and fundamentally on the training and qualification of human resources in higher education. To manifest innovation and creativity in them; To contribute to the growth and development. Mas-Machuca (Mas-Machuca, 2014) explained the role of leadership in the process of applying knowledge management in higher education institutions. And that there is a positive relationship between leadership and the successful application of knowledge management, and that leadership has an important role in creating a culture based on values, trust, transparency, and honesty, which will enhance the sense of belonging to the institution, and thus give the opportunity for employees to learn, develop and innovate. Sutz & Arocenaa (Sutz & Arocenaa, 2012) focus on the challenges facing higher education institutions in developing countries, which must be faced in order to be able to play their role in contributing to the production of knowledge; For development, where these challenges are to enhance the scientific research and teaching processes and their performance at a high and distinguished level. The study of Kobalia and Garakanidze (Kobalia and Garakanidze, 2010) indicated that the teacher should not only be a transmitter of knowledge, but also have a positive attitude towards what characterizes the twenty-first century, and should be concerned with innovations, self-development, and the use

of student-centered teaching. Sorin and Bernders study (Sorin, 2013; Forstorp, 2008) suggested an effective model for establishing a global knowledge society through a future university that has educational needs for this, and Peijun (Peijun, 2009) indicates that the university works to identify, produce, use and disseminate knowledge, and this knowledge is either resulting from or used in scientific research, and thus human capital has the main role in using and producing the knowledge it acquires from the educational system, and from here the role of the educational system emerges as the most important drive to bring about change and a real revolution in the lifestyle through its responsibility in building the human being, which represents an essential element of production in the age of knowledge (Luigi & Ghignoui, 2011). Universities also have a leading role in establishing the knowledge society, but they face some challenges regarding the diversity of knowledge sources, and the emergence of new knowledge arising from cultural diversity and intellectual property. For his part, Sudhir (Sudhir, 2006) considers community service and the dissemination of knowledge and informatics as one of the pillars of the knowledge society, relying on technology and communication, spreading free education, generating ideas, building knowledge, linking science and knowledge to the labor market, opening new channels for learning, developing the necessary skills and abilities that students need during the process of learning and teaching, the development of the university student’s personality in light of the variables of the scientific era and the digital knowledge expansion.

Slaus (Slaus, 2013) discussed the role of higher education in the twenty-first century in changing people to enter the knowledge society and concluded the need to take care of lifelong education and make changes in it, by investing information and communication technologies to make it available to all, and that its task is to prepare competent working individuals, who have scientific solutions, have mature and independent personalities, and able to make decisions. Hong (Hong, 2014) believes that today’s societies need to move to employing knowledge as a tool for the development of society for the better. Here, the role of education and the development of skills and abilities appears in transforming the role of knowledge into a tool for community development (Blandul, 2015). From the point of view of Zarkovic and others (Zarkovic, et al., 2014), the characteristics of the knowledge society and their effects are development challenges for societies on the way to keep pace with the knowledge society. When we use terms such as: the economy of knowledge management, intellectual capital, and the knowledge factor, to denote the knowledge society and its economy, this means that its members need a set of intellectual skills that did not exist previously, and that their mastery is crucial to the ability of workers to compete in the labor market; Which contributes to the emergence of awareness of the need for continuing education and its development (Orlanova, 2012). On the

other hand, there are many views on the requirements of the knowledge society, but they focus on the human side in most of them, and the cognitive side and creative thought, in which the educational system plays a major role (Marin & Ioana, 2012). Therefore, the establishment of an advanced educational system represents the most important component of the knowledge society, only through preparing students with the ability to deal with the labor market requirements, by providing them with the skills of the twenty-first century (Oguz & Aydin, 2012). The shift towards a knowledge society is a process that has repercussions on education as one of the main community activities, as knowledge needs conscious management, and achieve the stages and the cycle of knowledge through medias, and this will only be achieved by the availability of the creative and productive human element (Metcalf & Fenwick, 2009). The knowledge society is based on several requirements, such as effective administrative leadership, empowering workers, establishing flexible organizational structures that are commensurate with performance requirements, and building an integrated strategy that expresses the organization's directions and future vision, as well as cultural change for members of the knowledge society, deepening the latent knowledge of individuals, and forming a vision centered on the principle, restructuring human resources, and restructuring process engineering (Dinkelaker, 2010). Since there are several requirements for the knowledge society, this requires that the academic performance be developed and in par with those requirements. Which positively reflects on the outputs that should be prepared for the twenty-first century (Hong, 2014). It can be said that the characteristics of the knowledge society are derived from the characteristics of information technology itself, such as interest in scientific research and human capital. By creating a scientific competitive atmosphere via encouraging the spirit of innovation (Alwahesh, 2015). In addition to acceleration, and what it requires to deal with rapid changes in new ways and methods compatible with the nature of this acceleration, and attention to lifelong education, as education is the basis for capacity building and skills development, the expansion of knowledge, and then development, focusing on and deepening mental work through knowledge creation, and problem solving (Kwak & Standish 2014). Vali (Vali, 2012) emphasized the role of education in the knowledge society, and that knowledge is an important factor for economic and social development, and that the opportunities offered by new technologies allow students to learn more quickly, access and evaluate information, solve complex problems, and deal efficiently with the tools of the era of information and communications.

Based on the foregoing, it is clear that higher education has to play new roles that enable it to contribute to building a knowledge society, and to achieve this; There are requirements that necessitate the need to shift from the level of dealing with data and information, to the level of

employment and production of knowledge, and the ability to make optimal use of knowledge in generating ideas and producing new theories, and this can only be achieved through strengthening the skills of the twenty-first century (Blandul, 2015). To be able to prepare students in an advanced manner that suits the needs of the labor market in the era of the knowledge economy, we must instill the appropriate competencies for the current era, and these competencies can be obtained through teaching the twenty-first century skills that are related to the development of higher thinking skills. While Coccoli and others (Coccoli et al., 2014) considered higher education institutions as smart institutions, because they use the skills of the twenty-first century to improve the performance of their graduates and enhance their quality. They are like the smart cities that provide smart services and applications to their citizens to enhance their quality of life. Jan's study (Jan, 2017) confirmed that effective teaching is a major determinant of education productivity and quality. Therefore, teachers must possess, in addition to specialized knowledge, the skills of the twenty-first century, and the competencies necessary for their professional life to teach them and provide them to their students so that they can benefit from them later in their working lives. As for the results of the study of Oudeweetering & Voogt (Oudeweetering & Voogt, 2018), it was shown that the study activities enhanced some twenty-first century skills among students, such as: digital literacy, creative thinking, critical thinking, communication, structured learning, and cooperative learning. Thus, teachers see the importance of integrating twenty-first century skills into the curricula in a fundamental way. In response to the slogan (Every learner is different therefore, one-size-fits-all models suit no one), which means "Every student is different, so there is no one-size-fits-all learning style". Christensen & Knezek (Christensen & Knezek, 2017: 26) indicated that students need to practice a variety of activities, use appropriate technology tools, and learning through innovative teaching methods such as project-based learning, problem solving, cooperative learning and others to suit their different learning styles. Trilling & Fadel (Trilling & Fadel, 2009) argued that higher education systems should focus on preparing a workforce for high-income knowledge economy jobs that require complex skills and innovative expertise. Given that the world today is witnessing a digital revolution, it is necessary to constantly interact with information and communication technology systems, especially in the field of education, by enhancing the twenty-first century skills of higher education students, which is possible by integrating smart technology with learning methods and strategies (Gerstein, 2014). It was also found that there is a relationship between continuing education and the promotion of social capital and the welfare of the community, through the development of the competencies of its members (Merriam & Kee, 2014).

It has been noted that males appreciate technical skills more, while females rank social skills at a higher level, and

that social skills and cooperation have ranked high in the skills that students need in the future of the twenty-first century skills. And that information and communication technology is one of the most needed skills for students in the twenty-first century, followed in second place are life and work skills; Including: social skills and cooperation (Ahonen & Kinnunen, 2015). While previous studies showed a deficiency among graduate students in higher education in acquiring the skills of the twenty-first century (Fong et al., 2014). For his part, Ahmmad (Ahmmad, 2016) argued that despite the increasing role of higher education institutions in the production, dissemination, and employment of knowledge in its outputs and among members of society; Its role in realizing this fact is weak and does not enable it to accelerate the consolidation of the foundations of knowledge. Hence, we will expand the current endeavors in research by identifying the academic leaders' perceptions of the twenty-first century skills necessary for higher education students in light of the requirements of the knowledge society. Therefore, we will answer the following study questions:

1. What are academic leaders' perceptions of the necessary skills for higher education students in the twenty-first century?
2. What is the degree of compatibility of programs and practices of higher education institutions with the skills of the twenty-first century from the point of view of academic leaders?
3. Are there statistically significant differences at the level ( $\alpha \leq 0.05$ ) in the academic leaders' estimates of the necessary skills for students of higher education in the twenty-first century due to either variable (academic specialization, academic rank, job position)?

### 3 Method and Methodology

This study is an applied study based on the descriptive analytical approach, which depends on the study of reality or phenomenon, and verification of many relationships between independent and dependent variables (Bell & Bryman, 2007; Saunders et al., 2012). A structured questionnaire was developed to collect information Analyzing and testing hypotheses about the variables included in the proposed framework, by referring to previous literature. The study community consisted of (753) academic leaders in official Saudi universities located within the Saudi capital, Riyadh, and a regular random sample was selected. (254) leaders, representing (34%) of the study population. Accordingly; (254) questionnaires were distributed to the members of the analysis unit, of which (237) were retrieved, (13) were excluded from the analysis process, which suffer from wide missing values (Hair et al., 2010). Thus the number of correct and valid questionnaires becomes For the analysis process (224) a questionnaire, and table (1) shows the personal and functional characteristics of the members of the analysis unit, and the main strength in choosing academic leaders is that they represent the most important element in preparing study plans and practices in higher education, and they are the main focus in developing performance in the age of the knowledge economy and the management of higher education affairs. While choosing the official Saudi universities is because they are the focus of achieving the requirements of the twenty-first century skills in higher education, although the majority of studies were focused on the application of twenty-first century skills in public education (Songkram et al, 2021; Al Saud, 2021; Stehle & Peters-Burton, 2019; Ahonen & Kinnunen, 2015), however, this poses a challenge to test these results. responding to the demands of the knowledge society, the researchers applied this study in higher education institutions in three official Saudi universities in the capital, Riyadh.

**Table 1:** Personal and functional characteristics of the study sample.

number	variable	categories	recurrence	percentage	total
1	Academic major	Scientific majors	140	63%	224
		Human majors	84	37%	
2	Academic rank	Professor	70	31%	224
		Co-professor	98	44%	
		Assistant Professor	56	25%	
3	position	Dean	38	17%	224
		Vice	98	44%	
		Department head	88	39%	



Table (1) indicates the demographic characteristics of the respondents from the analysis unit, it was found that (63%) of the analysis unit members are from scientific majors, which is a reasonable percentage in the university environment in Saudi Arabia. regarding the academic rank of the respondents (75%) of the members of the analysis unit was at the rank of professor and co-professor, which is a reasonable percentage, as the majority of academic leaders in Saudi universities have distinguished research activity and leadership roles in Saudi universities. Finally, the results showed that (83%) of the members of the analysis unit are in the category of vice and head of the department in the career center, and this is logical due to the multiplicity of academic departments in the colleges, and accordingly, the data indicate that the majority of the participants from the analysis unit members have sufficient knowledge experience to participate and provide reliable data on the data under study.

#### 4 Items Measurement

The study scale (the questionnaire) was built to measure its variables, and it consisted of three parts, where the first part consisted of personal data. The second part of the scale consisted of (40) paragraphs for measuring the degree of twenty-first century skills necessary for students of higher education, divided into three areas: (learning and creativity skills, digital culture skills, and professional and life skills). The third consisted of (15) items to measure the compatibility of higher education programs and practices, with the skills of the twenty-first century, divided into three

areas: (learning and creativity, digital learning, and professional development), with reference to theoretical literature and related previous studies (Khan et al., 2019; Kan & Murat, 2018; Songkram et al., 2019; Al-Maloof et

al., 2018; Ahonen and Kinnunen, 2015; Onggardwanich et al., 2015).

#### 5 The Reliability and Validity of the Measurement

In order to measure the factors and verify their validity, the study scale (the questionnaire) was presented to a number of arbitrators with expertise, experience and competence in leadership, and their number was (11) arbitrators. To verify the apparent validity of the scale. The cut-off degree between the arbitrators on the observations exceeded (87%), which is an acceptable degree according to Nedlesky's Method. In light of the arbitrators' observations, the necessary modification, deletion or addition was made to develop the questionnaire in its final form. The researchers calculated the validity of the internal consistency, using Pearson correlation coefficient to measure the degree of correlation of each axis with the total score of the questionnaire. The extent of the internal consistency of the items of the scale was tested, while the coherence of the scale was evaluated using the (Cronbach Alpha) calculation, as it depends on the consistency of the individual's performance from one item to another. Although there are no standard rules Regarding the appropriate values, Alpha, but from an applied point of view, ( $\text{Alpha} \geq 0.60$ ) is reasonable in research related to management and human sciences (Sekaran & Bougie, 2010). The result of the stability of the scale dimensions was that the 21st century skills variable obtained a stability coefficient of (0.88), And the compatibility variable with skills was (0.89), which are acceptable percentages for carrying out the analysis process to achieve the objectives of the study, and Table (2) shows the validity and reliability coefficients of the study tool.

**Table 2:** Validity and reliability coefficients for the study scale domains.

Number	Field	No of Paragraphs	Structural validity		Total
			Correlation factor	Indication level	Cronbach Alpha factor
1	Learning and creativity skills	16	0.88	0.000	0.89
2	Digital culture skills	9	0.91	0.000	0.86
3	Career and life skills	15	0.87	0.000	0.84
Total 21st Century Skills		40	-	-	0.88
1	learning and innovation field	5	0.93	0.000	0.88
2	digital learning field	5	0.91	0.000	0.87
3	professional development field	5	0.89	0.000	0.89
Total skill compatibility scale		15	-	-	0.89

It is clear from Table (2) that the values of the correlation coefficients for the twenty-first century skills domains came with high values, ranging between (0.89 - 0.84); The domains of the compatibility scale with skills ranged between (0.89 - 0.87), and all of them were statistically significant at the level of significance (0.01); This indicates the availability of a high degree of structural validity for the scale axes. It was also noted that the values of the stability coefficients of the scale axes came with high values, as the values of the stability coefficients of the scale axes in the twenty-first century skill areas ranged between (0.91 - 0.87); and skill compatibility scale domains ranged between (0.93 - 0.89). The value of the overall stability coefficient for the twenty-first century skills axes was (0.88); and (0.89) for the axes of the skill compatibility scale. These values of the stability coefficients indicate the validity of the scale for application and the reliability and trust on its results.

## 6 Statistical Processing

The study used some statistical methods that fit with the nature of the study scale, and are suitable for achieving its objectives, namely: arithmetic averages, standard deviations, percentages, T-test for two independent samples, one-way analysis of variance test, coefficient of variance inflation, regression analysis of variance, and prediction model, Scheffe test, Pearson correlation coefficient, split-half method, and Cronbach's alpha coefficient. In order to judge the average responses of the sample members to the domains and items, the following relative scale was relied on: From score (1) to less than score (2.33), the importance is weak, and from score (2.33) to score (3.66) The importance is medium, and from score (3.67) or more, the importance is high.

## 7 Discussions of the Results

**Results related to the first question:** What are the academic leaders' perceptions of the necessary skills for higher education students in the twenty-first century? To answer this question, the arithmetic mean, and standard deviation were extracted to determine the degree of perceptions of the study sample about the necessary skills for students of higher education in the twenty-first century in light of the requirements of the knowledge society, and Table (3) shows this.

It is clear from Table (3) that the degree of perceptions of the study sample about the necessary skills for students of higher education in the twenty-first century considering the requirements of the knowledge society came to a high degree, with an arithmetic mean of (3.82), and with a

standard deviation of (0.87), and the arithmetic means of the fields ranged between (3.91 - 4.22), and its standard deviations ranged between (0.96 - 1.06), where the domain of digital culture skills came in the first rank with the highest arithmetic mean of (4.22), and with a standard deviation of (0.96), with a high degree. Followed in second rank is the domain of learning skills, and creativity, with an arithmetic mean of (4.07), and a standard deviation of (0.98), and at a high degree. Finally, the third and last rank is the field of profession and life skills with an arithmetic mean of (3.91), and a standard deviation of (1.06), also with a high degree. This is due to the vital importance of the skills approach in higher education in the twenty-first century, and its integration into higher education, as a major factor in competitiveness; The knowledge economy requires high levels of imagination, creativity, and innovation, as well as linking education with life and work skills, which higher education students should be able to access to the third millennium ably. The number of digital skills may be attributed to the study sample's awareness of the importance of digital skills, and information and communication technology, in enhancing students' learning and increasing their knowledge enrichment, especially in the era of information technology and the expansion of knowledge and the challenges imposed by the Corona pandemic recently. This result agreed with the study of (Khan et al., 2019; Jan, 2017; Ahonen and Kinnunen, 2015; Ongardwanich et al, 2015; Pheeraphan, 2013), whose results came to a high degree, and this result differed with the result of both studies of (Alrabayea, 2014; Abu Suailek, 2014; Fong et al, 2014), the results of which came to a medium degree.

**Results related to the second question:** What is the degree of compatibility of programs and practices of higher education institutions with the skills of the twenty-first century from the point of view of academic leaders? To answer this question, the arithmetic mean, and standard deviation were extracted, to determine the degree of compatibility of programs and practices of higher education institutions with the skills of the twenty-first century from the point of view of academic leaders, and Table (4) shows this.

It is evident from Table (4) that the degree of compatibility of programs and practices of higher education institutions with the skills of the twenty-first century from the point of view of academic leaders came in a medium degree, with an arithmetic mean of (3.52), and a standard deviation of (0.85), and the arithmetic means of the fields ranged between (3.38 - 3.64), and its standard deviations ranged between (0.89 - 0.84), where the field of learning and innovation came in the first rank with the highest arithmetic mean of (3.64), and with a standard deviation of (0.87), and

with a medium degree. Then followed by the second rank with the average arithmetic field of career development skills, which reached (3.55), with a standard deviation of (0.89), and with a medium degree. Finally came in the third and final rank in the field of digital learning with an arithmetic mean of (3.38), and a standard deviation of (0.84), also with a medium degree. This is because higher education programs and practices do not sufficiently enhance the skills of the twenty-first century, which is reflected in its outcomes. Because of the lack of a clear vision for these institutions to implement these skills, and their lack of clear standards in this direction, despite the existence of promising curricula that support this. This result agreed with the study of (Khan et al., 2019; Ahonen and Kinnunen, 2015, Ongardwanich et al., 2015), whose results came with a moderate degree of agreement, and differed with the study (Jan, 2017), whose results came

**Results related to the third question:** Are there statistically significant differences at the level ( $\alpha \leq 0.05$ ) in the academic leaders' estimates of the necessary skills for students of higher education in the twenty-first century due to either variable (academic specialization, academic rank, job position)? This question was answered as follows:

- 1) **According to the academic specialization variable:** To reveal the significance of the differences between academic leaders' estimates of the necessary skills for students of higher education in the twenty-first century due to the academic specialization variable (scientific specializations - humanities). The arithmetic averages and standard deviations were calculated, and a t-test was performed. The results were as in Table (5).

**Table 3:** Arithmetic averages, standard deviations, rank, and relative importance of the twenty-first century skills scale.

N	Field	Arithmetic average	Standard deviation	Outcome percentage	Rank	level
1	Learning and creativity skills	4.07	0.98	81%	2	High
2	Digital culture skills	4.22	0.96	84%	1	High
3	Career and life skills	3.91	1.06	78%	3	High
Total 21st Century Skills		4.07	.98	81%		high

**Table 4:** Arithmetic averages, standard deviations, and the degree of compatibility and arrangement to reveal the degree of compatibility of programs and practices of higher education institutions with the skills of the twenty-first century.

N	Field	Arithmetic average	Standard deviation	degree of compatibility	Rank
1	Learning and innovation	3.64	0.87	Medium	1
2	Digital learning	3.38	0.84	Medium	3
3	Career development	3.55	0.89	Medium	2
Total skill compatibility scale		3.52	0.85	Medium	

It is evident from Table (5) that there are no statistically significant differences at the significance level ( $\alpha \leq 0.05$ ) between academic leaders' estimates of the necessary skills for students of higher education in the twenty-first century due to the variable of academic specialization (scientific, humanities). For all fields, based on the calculated t-values for the dimensions of skills of the twenty-first century individually and collectively, which amounted to (0.907) and a significance level (0.268), and this result means that academic leaders' estimates of the necessary skills for

students of higher education in the twenty-first century are the same regardless of their academic specialization, and perhaps this result can explain the common understanding and awareness among all academic leaders in their different specializations. And assessing the necessary skills for students of higher education in the twenty-first century by virtue of their leadership positions. This makes sense; they live in the same occupational conditions; They conduct the same leadership and management activities and tasks. The academic leaders in higher education institutions

**Table 5:** Arithmetic averages, standard deviations, and a t-test to reveal the significance of the differences between academic leaders' estimates of the necessary skills of higher education students in the twenty-first century, according to the academic specialization variable.

Field	Academic specialization variable				T value	Statistical significance
	Scientific specialization (X = 140)		Humanities specialization (X = 84)			
	Arithmetic average	Standard deviation	Arithmetic average	Standard deviation		
Learning and creativity skills	4.02	0.93	3.96	0.88	0.812	0.286
Digital culture skills	4.17	0.97	4.01	0.94	1.221	0.308
Career and life skills	3.92	0.89	3.91	0.91	0.722	0.312
Total 21st Century Skills	4.04	0.96	3.96	0.89	0.907	0.268

**Table 6:** Arithmetic averages and standard deviations to reveal the significance of the differences between academic leaders' estimates of the necessary skills for higher education students in the twenty-first century, according to the academic rank variable.

Field	Academic specialization variable					
	Professor (X = 70)		Co-professor (X = 98)		Assistant professor (X = 56)	
	Arithmetic average	Standard deviation	Arithmetic average	Standard deviation	Arithmetic average	Standard deviation
Learning and creativity skills	4.06	0.97	3.98	0.83	3.86	0.77
Digital culture skills	3.93	0.87	3.86	0.89	3.77	0.84
Career and life skills	4.12	0.99	4.08	0.96	4.01	0.94
Total 21st Century Skills	3.98	0.86	3.94	0.79	3.85	0.89

\*Statistically significant differences at the ( $\alpha \leq 0.05$ ) level.

also have a deep understanding about the entrance to the twenty-first century skills, and these leaders are working hard to optimally invest in their students regarding this aspect, regardless of specialization. Twenty-first century skills get the same opportunities of attention, practice, and application in all scientific and humanitarian disciplines. This result agreed with the result of the study of (Al-Maloof et al., 2018; Abu Suailek & Alwrekat, 2017), which showed that there were no statistically significant differences regarding gender and scientific specialization variable.

The results that appear in Table (6) indicate that there is an

apparent difference in the values of the arithmetic averages of the academic leaders' estimates of the necessary skills for students of higher education in the twenty-first century, at the level of each field and the overall level according to the academic rank variable, and to see if these differences are significant Statistically, Anova multiple analysis was performed. And table (7) shows this.

It is evident from table (7) that there are no statistically significant differences at the significance level ( $\alpha \leq 0.05$ ) between academic leaders' estimates of the necessary skills for higher education students in the twenty-first century, according to the academic rank variable (professor – co-

professor - assistant professor), for all fields. This result means that academic leaders' estimates of the necessary skills for higher education students in the twenty-first century are the same, regardless of their academic rank. Perhaps this result is explained by the deep understanding and awareness of these leaders concerning the necessary skills for students in higher education, regardless of their academic ranks, and that the estimation of the necessary skills does not differ from one rank to another. This is due to the association of these ranks with career maturity, and expertise in capacity development. They also have high administrative and academic experience that helps them to accurately assess the necessary skills needed by students of higher education in the twenty-first century in universities. Which contributes to making a qualitative development in higher education and achieving its competitive advantage. This result agreed with the result of the study (Al-Malooof et al., 2018), which showed that there were no statistically

significant differences regarding the academic rank variable.

**3) Depending on the variable of occupational position:**

To reveal the significance of the differences between the estimates of academic leaders of the necessary skills for students of higher education in the twenty-first century due to the variable of occupational position (dean – vice - head of department), and the results were as in Table (8).

The results that appear in Table (8) indicate that there is an apparent difference in the values of the arithmetic averages of the academic leaders' estimates of the necessary skills for higher education students in the twenty-first century, at the level of each field and the overall level according to the job position variable. To see if these differences are significant Statistically, Anova multiple analysis was performed. Table (9) shows this.

**Table 7:** The results of the Anova multiple analysis to reveal the significance of the differences between the academic leaders' estimates of the necessary skills of higher education students in the twenty-first century, according to the academic rank variable.

Variation source and Hotelling value	Dimensions of 21st century skills	Total of squares	Degree of flexibility	Average squares	F value	Significance level
Academic Rank lambda Walix value 0.936	Learning and creativity skills	0.198	2	0.099	0.266	0.718
	Digital culture skills	0.160	2	0.080	0.210	0.808
	Career and life skills	1.012	2	0.506	0.622	0.562
	Total	0.202	2	0.101	0.532	0.642
Error	Learning and creativity skills	82.226	221	0.372		
	Digital culture skills	84.288	221	0.381		
	Career and life skills	121.402	221	0.549		
	Total	42.042	221	0.190		
The total	Learning and creativity skills	82.424	223			
	Digital culture skills	84.448	223			
	Career and life skills	122.414	223			
	Total	42.244	223			

**Table 8:** Arithmetic averages and standard deviations to reveal the significance of the differences between academic leaders' estimates of the necessary skills of higher education students in the twenty-first century, according to the job position variable.

Field	Occupation position variable					
	Dean (X = 38)		Vice (X = 98)		Head of department (X = 88)	
	Arithmetic average	Standard deviation	Arithmetic average	Standard deviation	Arithmetic average	Standard deviation
Learning and creativity skills	4.06	0.94	3.95	0.84	4.02	0.92
Digital culture skills	4.24	0.89	4.16	0.91	4.04	0.91
Career and life skills	4.18	0.88	4.11	0.97	3.96	0.88
Total 21st Century Skills	4.16	0.89	4.07	0.91	4.01	0.93

\*Statistically significant differences at the ( $\alpha \leq 0.05$ ) level.

**Table 9:** The results of the Anova multiple analysis to reveal the significance of the differences between the academic leaders' estimates of the necessary skills of higher education students in the twenty-first century, according to the rank and occupational position variable.

Variation source and Hotelling value	Dimensions of 21st century skills	Total of squares	Degree of flexibility	Average squares	F value	Significance level
Academic Rank lambda Walix value 0.936	Learning and creativity skills	0.310	2	0.155	0.350	0.706
	Digital culture skills	0.224	2	0.112	0.221	0.802
	Career and life skills	1.041	2	0.521	0.815	0.445
	Total	0.206	2	0.103	0.475	0.615
Error	Learning and creativity skills	98.016	221	0.443		
	Digital culture skills	112.018	221	0.507		
	Career and life skills	141.281	221	0.639		
	Total	48.022	221	0.217		
The total	Learning and creativity skills	98.326	223			
	Digital culture skills	112.242	223			
	Career and life skills	142.322	223			
	Total	48.228	223			

It is clear from table (9) that there are no statistically significant differences at the significance level ( $\alpha \leq 0.05$ ) between academic leaders' estimates of the necessary skills for students of higher education in the twenty-first century, according to the job position variable (dean - vice - head of department), for all fields. Perhaps this result is explained by the common vision and accurate understanding of academic leaders in higher education in estimating the necessary skills that their students need, given the vital importance of those skills in higher education, regardless of the job position occupied by these leaders.

## 8 Theoretical and practical implication

This study is designed to identify the academic leaders' perceptions of the necessary skills for higher education students in the twenty-first century such as (learning and creativity skills, digital culture skills, and professional and life skills) in light of the requirements of the knowledge society. Thus, this study bridges the critical gap in theoretical literature. First, while previous studies were limited to public education and did not show a noticeable interest in it within the framework of higher education, considering global and digital transformations and taking into account the requirements of the knowledge society, especially theoretical literature related to higher education, where some studies neglected the vision of academic leaders and their perceptions of the necessary skills for students in the twenty-first century in light of the requirements of the knowledge society (Songkram et al., 2019; Alamri, 2021). Hence this study came to be distinguished from its counterparts from previous studies, which examined the perceptions of academic leaders of the necessary skills for students of higher education in the twenty-first century (learning and creativity skills, digital culture skills, profession and life skills), bearing in mind the requirements of the knowledge society, within a single theoretical framework, enriching higher education institutions and giving a new dimension to the literature related to it. Moreover, our approach to the twenty-first century skills is completely different from previous studies. We have studied twenty-first century skills according to the perceptions of academic leaders in higher education, rather than faculty members, and this step enables us to assess and evaluate this knowledge from several aspects. Second: We test our proposed framework in an Arab country such as Saudi Arabia, which differs significantly from those studies conducted in the western context, and this would further deepen our understanding of the skills of the twenty-first century and the requirements of the knowledge society in contexts that present a different culture and unique characteristics, especially in Arab countries. Third: The prior research implicitly assumes that higher education institutions attach an important attention to the skills of the twenty-first century, to enhance global competitiveness. And our findings confirm that twenty-first century skills provide opportunities for higher education students to

receive more learning, creativity, and competition, when students engage in enhanced learning of twenty-first century skills in participatory decision-making, and create innovation and creativity in them, so that they contribute to their development and growth. The probability that students in higher education will reach the correct learning and optimal solution is higher when twenty-first century skills are the norm in higher education institutions. Students will be more efficient in learning and problem solving, when they acquire these skills to a higher degree in reality, and this is consistent with the findings of our study that academic leaders' perceptions of the necessary skills for higher education students were high. Regarding practice, this study includes several recommendations for academic leaders in higher education, that the skills of the twenty-first century are the most appropriate to provide a supportive environment for learning and creativity. Moreover, the focus should be on building a knowledge society, and providing higher education institutions with a culture that enhances these skills among students at the private level or within the university.

## 9 Limitation of Study

It is perhaps difficult to find a study without restrictions. Likewise, this study has some limitations:

- The first limitation in this study: it focused on academic leaders' perceptions of twenty-first century skills in higher education, and this requires future studies to investigate the relationship between other variables.
- The second limitation in this study: It is not possible to generalize the results of this study outside the Saudi higher education sector, as the sample used in this study was from the official Saudi universities in the city of Riyadh, and this requires future studies, to test our framework in other sectors to check its validity predicting twenty-first century skills.
- The third limitation in this study: It was conducted on the official Saudi universities in the city of Riyadh, which limits the generalization of the results of this study to all universities in the Kingdom of Saudi Arabia, and this requires future research to survey a representative sample to make our results more general in the Kingdom as a whole.

## 10 Future researches

Despite the hint mentioned in the previous section, future studies should pay attention to repeating the same study model, to see if similar results will be obtained, moreover, the researchers could include other variables in future studies.

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