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Key Challenges in 21st Century Learning: A Way Forward towards Sustainable Higher Educational Institutions

Shabir Hussain Khahro [1,2,*] and Yasir Javed [3,*]

[1] College of Engineering, Prince Sultan University, Riyadh 11586, Saudi Arabia
[2] Educational Research Lab, Prince Sultan University, Riyadh 11586, Saudi Arabia
[3] College of Computer and Information Sciences, Prince Sultan University, Riyadh 11586, Saudi Arabia
* Correspondence: shkhahro@psu.edu.sa (S.H.K.); yjaved@psu.edu.sa (Y.J.)

Abstract: Educational institutes always explore new ways and trends to improve teaching and ensure learning in the classroom, especially at the higher educational level. In this fast-growing, dynamic world, the field of information technology (IT) has made huge progress in different sectors, including the education sector. Initially, the educational process and stakeholders' resistance made it challenging to implement new information-technology-based solutions in this key sector, but the recent pandemic made it easier at different stages. Universities must allow students to play an active role in developing pedagogy and share their ideas in order to meet the 21st century learning needs of today's students. This paper investigates the key challenges in a 21st century education. An extensive literature review was carried out for this research, followed by targeted expert feedback. The paper concludes that universities must cope with enrollment, finance and student support concerns in addition to transitioning their on-campus programs to virtual settings. Faculty must be interactive, captivating, collaborative and thought-provoking. Students should have a choice in how they learn knowledge and display it in accordance with their requirements and preferences. Technology usage should be interesting, efficient and responsible to improve the learner's experience. Students should also be taught how their education will affect their future and global impact.

Keywords: higher education; challenges; teaching and learning; student engagement; sustainable education

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1. Background

The ability for students to use skills and knowledge in relevant areas of interest and successfully evaluate, analyze and communicate while resolving and understanding issues in a range of contexts are defined as 21st century skills [1]. The "4 Cs" are the concept of 21st century abilities. To meet the needs of 21st century society, they even suggest up to 10 transversal talents; however, on this occasion, references are made to those provided by [2] known as "the 6 Cs". The necessity to harmonize the definitions of pedagogy, technology and the process of creating change led to the definition of this approach. These abilities are connected to gaining in-depth learning through modern pedagogy, which enables fostering global awareness in students by utilizing the potential of ICTs in the classroom. These six components, "Character education", "Citizenship", "Communication", "Critical Thinking", "Collaboration" and "Creativity and Imagination" are said to be able to foster in-depth learning. Through in-depth instruction that enables its application in daily life, the development of the aforementioned competencies will enable preparing students for 21st century society [3,4]. Currently, the entire society is immersed; university systems have taken on the task of revamping institutional education surroundings. During the COVID-19 worldwide crisis, the educational systems' ability to maintain operations as best as possible has been tested. Higher education professionals are more challenged than ever before to improve their ability to use ICTs [4].

Historically, the support of colleges and universities has come from traditional market economies. Most private universities have to maintain a certain number of enrolled students who can afford the fees. This means regular government support for public colleges in addition to tuition revenue. The worldwide COVID-19 pandemic and the speed at which the economy is changing have both undermined the validity of conventional models, placing pressure on institutions to revise their business plans.

More than one billion children and college students have been driven out of school as a result of COVID-19, almost instantly leading to the largest education technology adoption in history [5]. Schools and colleges are rushing to revamp their classrooms and curricula to make it possible for students of all ages to complete their coursework from home. For students, instructors and parents (particularly women), this poses enormous practical and logistical challenges. However, it also presents several possibilities to rethink what learning looks like in the twenty-first century. The 21st century learning framework presented in Figure 1 is proposed by [6].

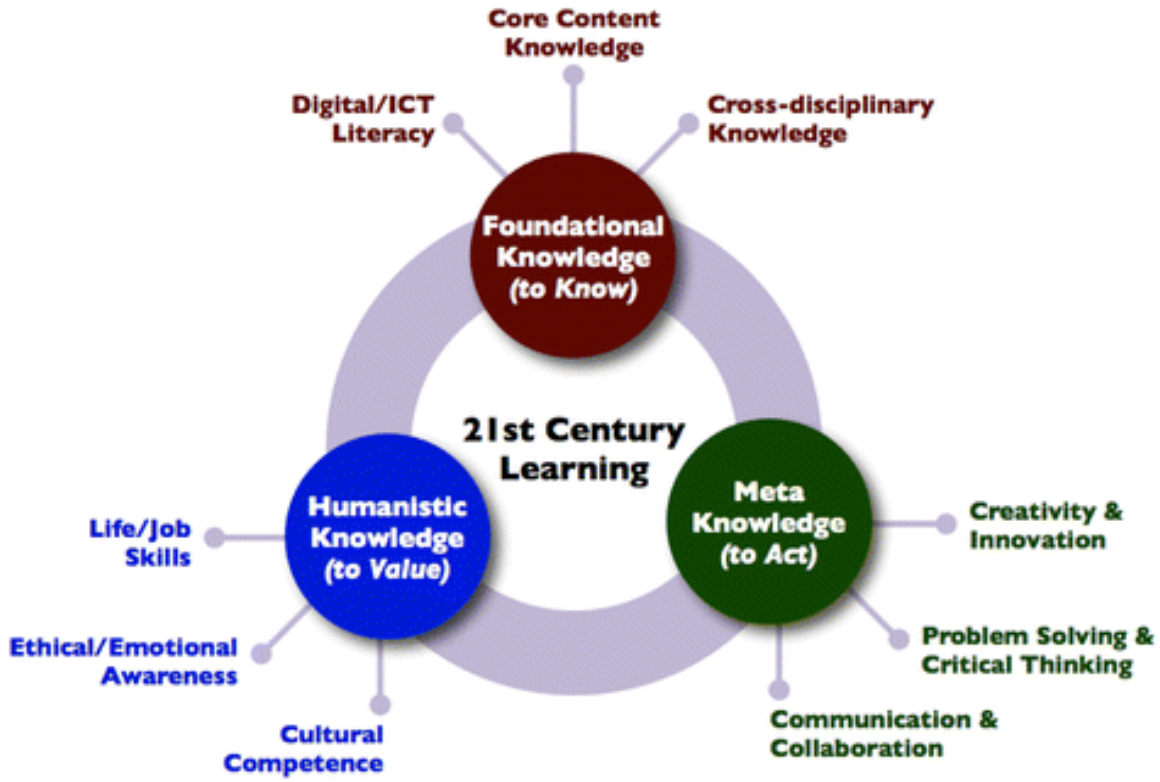

Figure 1. The 21st Century Learning Framework [6].

There are three key areas to improve teaching and learning in the 21st century. Foundational knowledge is the first key area of improved teaching. It is very significant that the various disciplines should provide the core knowledge of the field to the learner. Additionally, disciplines will provide multi and similar field knowledge to the learner because it is a dynamic world, and single-field knowledge will not be enough for learners. In the second stage, meta-knowledge plays a vital role for learners. Educational institutions should help learners to improve creative thinking, problem solving and collaboration. The foundational stage will support this stage. Without core knowledge and an understanding of the core degree program, it is not easy to attain meta-skills. In the last stage, humanistic skills are developed. It includes jobs, ethical responsibilities and cultural values for the learners of the 21st century. It is very important to improve such skills in this dynamic world.

Universities have been challenged by the technological society of the future to improve their educational processes, particularly with regard to how new technologies may help teaching and learning. Assessing whether students learn better with or without a certain

technology is a common starting point for research on the educational use of technology. The numerous roles that technology has played in the advancement of teaching and learning are broadly acknowledged by the present research-based pedagogic development trends. The first objective of the study in this area is to comprehend the implications of an increasingly technological world for learning in diverse situations (i.e., how new technologies are affecting literacies) [7]. The secondary objective is to offer information on how technology may be used to accelerate the acquisition of many new skills and competencies required in a knowledge society [8]. A further topic of research seeks to highlight the opportunities that technology presents for enhancing educational settings by taking student voices into account when creating pedagogies [9].

Recently, governments, businesses and educators expressed a strong desire to find a model of learning and evaluation in higher education that matches the challenges of learning in the digital present while also preparing students for an uncertain future. The phrase "twentieth-century learning" refers to the belief that fundamental changes, such as learning and education, have happened in the twenty-first century as a result of fast-changing technology and globalization [6]. Students can significantly contribute to the advancement of university pedagogy because technology is unavoidably transforming the dominant culture of teaching and learning. For instance, students could be better at utilizing various digital tools and social media applications than their professors; thus, the pedagogical design should make use of these learning resources. To change what qualifies as education though, power dynamics must be balanced. Consequently, rather than being a set procedure, pedagogic leadership is more of a dialectical one. A conversation between professors and students is necessary for the development of organizational practices, norms and structures, particularly in university environments [10].

Recent studies have shown that teacher orchestration enhances learning processes and opens up new opportunities for technology-enhanced learning (TEL) [11]. It would be difficult to restrict instructor orchestration to solely in-class tasks while using technology. Only a small portion of TEL learning normally takes place in the classroom with the teacher present, especially in university settings. TEL often takes place through autonomous, small-group or whole-class activities using a variety of learning platforms and social media outside of real face-to-face classes. The term "instructor orchestrate" refers to both the planning of diverse learning activities with varying instructor roles, learning materials and student technological preferences, as well as the management of various learning processes both within and outside the classroom [12–15]. The recent unexpected impact of the global pandemic on higher education has caused universities, governments, students and teachers to re-examine all components of existing systems, including how to become more effective and efficient in using technologies for education [16].

The higher education systems of many nations have undergone significant changes in the last few years, including the emergence of new types of institutions, adjustments to financing and governance practices, the establishment of mechanisms for evaluation and accreditation, curriculum reforms and technological advancements [17,18]. However, not all areas of higher education are seeing as much change as others. Some colleges have made a point of preserving their customs, good or ill. Education must be proactive in addressing the needs of the individual, as well as the requirements of society and the community at large, if today's students are to be equipped for the future and all of its possibilities. To inspire future generations of learners to be capable, inventive and highly motivated about continuous learning, 21st century education should be centered on critical thinking, global awareness, communication skills, optimistic behavior, social inclusion, cooperation and decision-making [19–21]. Therefore, this paper aims to investigate the key challenges for 21st century teaching and learning. It also proposes suggestions to improve and enhance the student-centric classroom environment for meeting 21st century skill requirements.

2. Research Aims and Objectives

This paper aims to explore the key challenges for higher educational institutions. The pandemic affects most areas of human life, and the education industry is not an exception. The dynamics of the educational industry changed after the pandemic. Universities have adaptive online and hybrid teaching practices. After the pandemic, universities face different challenges to meet the demands of jobs and skill sets of the 21st century. Therefore, this paper explores, specifically, the challenges for 21st century education, and it also suggests suitable remedial measures to cope with the challenges.

3. Research Methodology

A detailed literature review was carried out for this research. The challenges were identified through a comprehensive literature examination of the previous research carried out on educational background publications from peer-reviewed journals. In the later stage, a qualitative assessment was conducted for identifying challenges through a set of questionnaires. The data were collected from senior academicians and educational experts who are currently serving at the university level. The data in the later stage were assessed in SPSS 24.0 using descriptive analysis. The final ranks of the key challenges for 21st century education at higher-level institutes were finalized. Once the key challenges were identified, then based on the ranks of the key challenges, the suggestions plan was proposed, and the key remedial measures were identified from a comprehensive literature review followed by targeted expert interviews. After integrating the experts' feedback, another set of questionnaires was developed to seek the experts' feedback on the significance and effectiveness of the suggested remedial measure. Likewise, the challenges and the remedial measures were sent to experts working in the field, and they were requested to rank the significance of the remedial measure using a Likert scale of 1 to 5, where 1 is the least effective and 5 stands as the most effective measure. The complete research flow is presented in Figure 2.

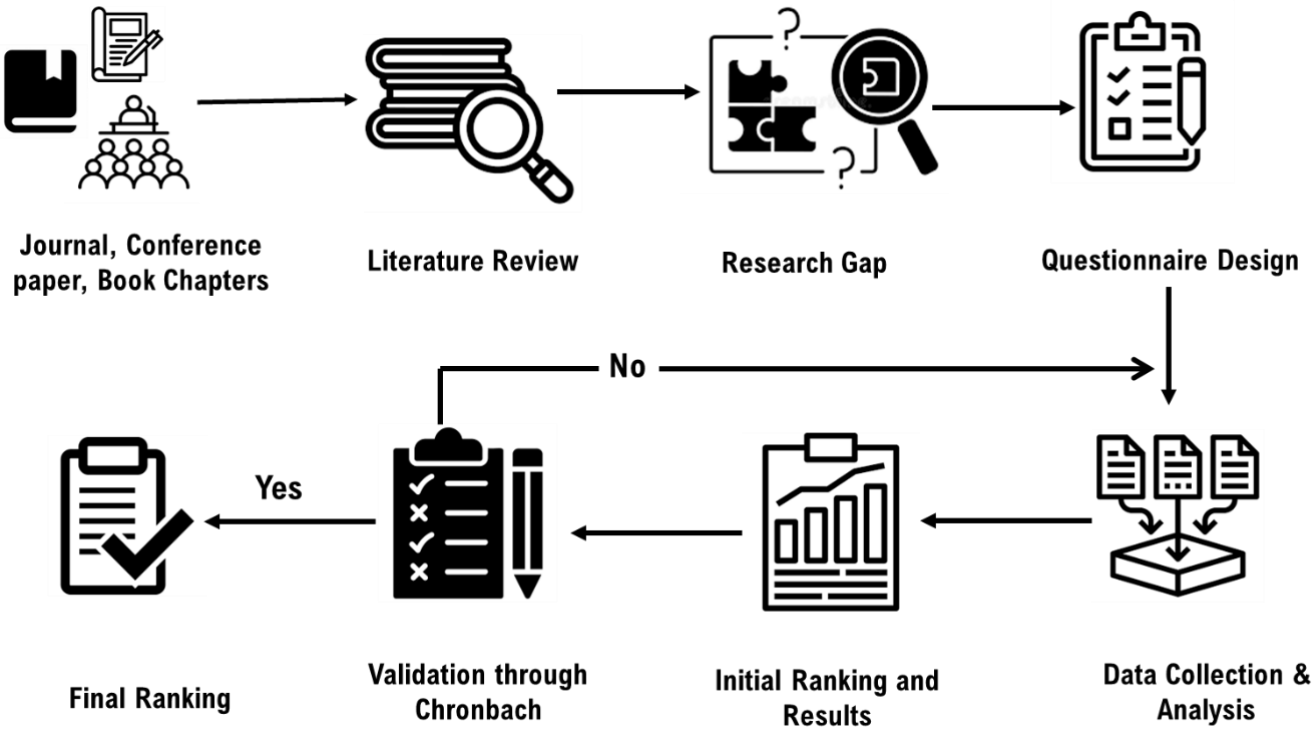

Figure 2. Research Methodology.

It is focused on finding recent studies that have been completed, such as those completed in 2022, and then, later on, studies that have been completed earlier in the decade. This literature review aims to identify key issues that can be used to determine the gaps in the research by identifying key issues. On the basis of a literature review, questionnaires were developed to better understand the challenges that organizations face today and the most common approaches used to address these challenges. Through the use of statistical approaches, the results were analyzed to create a ranking of the challenges based on the results. Thereafter, the survey was conducted again to find out what solutions could address the challenges of the 21st century, and the results were validated through Cronbach's alpha method. Ultimately, a final ranking was developed that can serve as an initial guideline in addressing the educational challenges of the 21st century.

4. Data Collection and Analysis

The data were collected from senior faculty members of the institutes having more than three years of teaching and research experience. Around 210 questionnaires were sent to experts in phase one, using physical questionnaires and online platforms. A total number of 172 questionnaires were successfully received and assessed in the final findings of this research. The overall accomplishment level of received questionnaires was 82%, which is a good sample number for data analysis [22]. The questionnaire has two sections. The first section deals with the general demographic information, and the second deals with challenge factors. Once the questionnaires were received, then descriptive and formative assessment of the data were completed in SPSS 24.0.

The data were analyzed by arithmetic average mean using Statistical Package for Social Science (SPSS), version 24. The formula for arithmetic average mean is shown in Equation (1).

$$A = \frac{1}{n}\sum_{i=1}^{n} a_i = \frac{a_1 + a_2 + \ldots + a_n}{n} \quad (1)$$

where a_1, a_2 and a_n are portfolio returns for period n, and n is the number of periods.

The final ranks of the key challenges are based on these findings. A similar approach is adopted for questionnaire two, which suggests the most suitable measures to improve educational quality in the 21st century.

5. Validation of the Findings

The capacity of a tool to estimate consistently depends on its reliability. In mathematics, dependability is defined as the ratio of the actual variance score to the total variance score. When proving the validity of conclusions based on scores from assessments and tests, reliability is also considered an important source of evidence [23]. Cronbach's alpha is also known as a measure of internal consistency used in the context of multi-item measurement instruments and has a wider application now than in its early development [24]. Cronbach's alpha is used to measure the amount of variance in a set of test scores that is systematic or consistent. It can vary from 00.0 (if no variation is consistent) to 1.00 (if all variance is consistent), with any value in between feasible [25].

6. Results and Discussion

A survey was conducted among a group of educational experts with a wide range of experience in education to uncover what issues and challenges are prevalent in 21st century education and what can be done to resolve them. A total of 60% of the respondents were in the 30–50 age range when the survey was conducted. The details can be found in Figure 3.

Given the wide range of ages covered in this survey, it is clear that it is intended for all age groups, and therefore, it is likely to cover a wide range of major aspects and versions across generations. Throughout the education industry, there are a variety of experts who possess a lot of experience in the field, as shown in Figure 4.

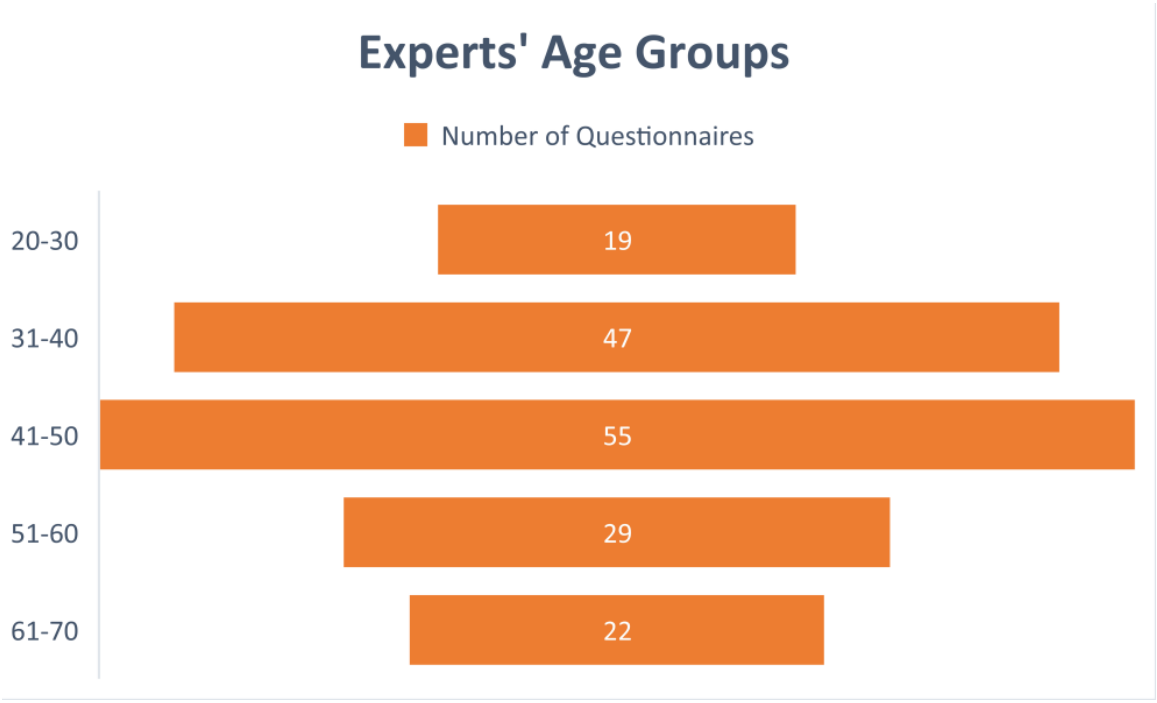

Figure 3. Experts' Age Groups contributing to surveys.

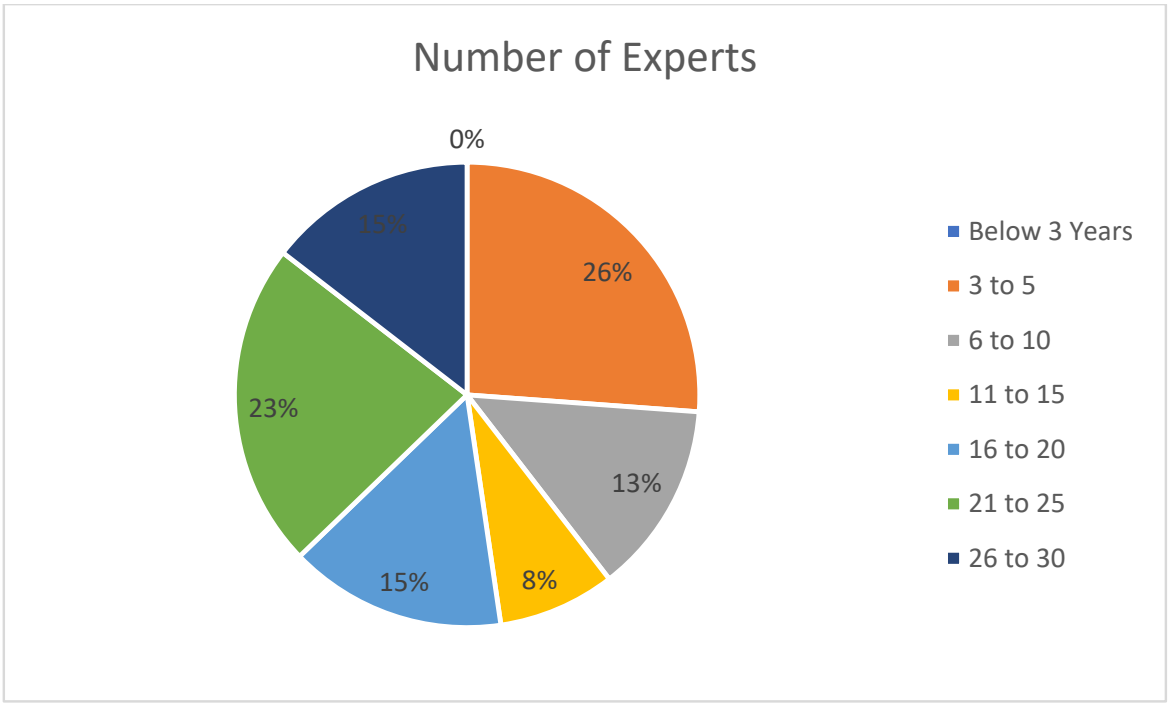

Figure 4. Experience of experts responding to surveys.

While it is apparent from the survey that many of the younger experts have less experience than their older counterparts, none were younger than 30 years old, and therefore, their opinions and choices were given considerable weight as a result of this. This result resulted in more than half of those in attendance having accumulated about 10 years of experience, which added a new dimension to the difficulties and issues discussed. Figure 5 shows the qualification level of educational experts who contributed to the research study that helped this research in identifying and validating the key challenges in 21st century education.

Figure 5. Education of experts responding to survey.

It is interesting to note that most of the respondents to the survey are doctorate holders. This does not necessarily mean that their doctorate is in the education discipline; however, they do hold a Ph.D. degree and are currently serving as educators. Approximately 13% of the respondents hold a graduate degree, while 11% hold a bachelor's degree, according to the survey. Table 1 shows the identified challenges that were identified by the expert respondents.

Rankings were based on the scores that were received from the expert respondents in the survey. To determine the ranking, it was necessary to keep in mind that the highest score obtained by each challenge was used as the basis. Enrolling students is a major challenge in the current era, which is primarily a result of several factors such as increased enrollment costs, increased transportation costs and changes in selection criteria. Furthermore, students are experiencing financial hardships, which are hindering their progress. It has been observed that with the rise of social media and the internet over the past few years, many young people and even adults are constantly connected to social media and the internet, which often causes them to fear being left behind, as well as missing out. A new method of generating student engagement in the learning process is needed as a result of the impact of the technological revolution on the traditional educational system. These challenges have resulted in neurological changes occurring in the brain, so technological addiction can now be added to the list of behavioral addictions that affect the human brain. Moreover, sustainability is an issue that needs to be addressed because most of the newer solutions are ad hoc in nature and require green solutions to be sustainable. A decrease in graduation rates has been attributed to catastrophic events such as COVID-19 and other major outbreaks. It is believed that a lack of access, financial constraints, as well as a few other factors are responsible for this problem. Additionally, travel restrictions and visa restrictions have resulted in a decrease in the number of international students. All challenges are discussed in detail in the following section.

Table 1. Identified key challenges of the 21st century with their ranking.

Challenges for 21st Century Education	Score	Standard Deviation	Rank
Student Enrollment	4.21	0.9587	**1**
Financial Difficulties	4.18	0.8932	**2**
Tech Addiction	3.92	1.0290	**3**
Sustainability	3.78	0.9030	**4**
Fewer High School Graduates	3.51	0.8744	**5**
Decreased State Funding	3.44	0.8893	**6**
Curriculum changes	3.12	0.7990	**7**
Declining International Student Enrollments	2.48	0.7320	**8**

6.1. Student Enrollment Is Declining Overall

The percentage of schools that have fulfilled their enrollment objectives for the fall 2017 term by May 1 was 34%, down from 37% in 2016 and 42% in 2015. Furthermore, 85 percent of senior admission personnel said that meeting institutional enrollment objectives was very important to them. The impact of the COVID-19 pandemic on student achievement is expected to be felt by spring 2021. Pandemic-related drops in student achievement are about similar to pupils missing from one-half to one full year's worth of arithmetic learning and from one-third to one-half of a year's worth of English language arts study [26]. Early research suggests that the COVID-19 pandemic lowered public school enrolment significantly [27].

6.2. Financial Difficulties

A 2017 Inside Higher Ed study found that 71% of chief business officers concurred that higher education institutions are facing serious financial challenges. This marks an eight percent increase from 2016 levels. Undergraduates who experience financial hardship, self-reported stress related to debt, and those who consider quitting school for financial reasons are more likely to have depression, anxiety, psychosis, alcohol dependency and other generalized mental health issues [28]. A significant area of emphasis in higher education is financial literacy. An essential component of national financial literacy initiatives is guaranteeing that college students have a proper degree of financial literacy [29,30].

6.3. Tech Addiction

Those with gaming disorders prefer playing video games over other activities and keep playing them even when doing so has harmful effects. Jamie Mitus, an assistant professor and chair of the Department of Counseling and Mental Health Professions at Hofstra University, claims that technology obsession can result in psychological, physical and social disorders in addition to depression, anxiety, repetitive motion disorder and sleep deprivation. By 2020, there will be an estimated five billion smartphone users, up from the current level of over two and a half billion. Long-term smartphone use suggests a fascination with the digital world. Students from secondary school through higher education make up the majority of smartphone users, which raises concerns about addiction that might have a detrimental impact on academic performance [31].

6.4. Sustainability

The concept of Education for Sustainability encourages students, schools and communities to take action to promote sustainability on a local, regional and global scale. Through education for sustainability, students and schools will gain a deeper understanding of sustainability issues while developing the skills required to innovate and come up with sustainable solutions.

6.5. Fewer High School Graduates

The Western Interstate Commission for Higher Education reports that the number of high school graduates dropped by 80,000 between 2016 and 2017. Wisconsin, Illinois, and Indiana were a few of the states that had the biggest drops. Due to "expected foreign student enrolment losses for autumn 2020", according to a NAFSA estimate issued early in the pandemic, HEIs would lose at least USD 3 billion [30]. This financial scenario was made even more difficult for campus administrators in July 2020 by revisions in USCIS instructions. Before the COVID-19 pandemic, the United States had a decline in higher education enrollment [32].

6.6. Decreased State Funding

The recent drop in state financing for public universities and community colleges has resulted in a reduction in vital services for students, putting severe strain on these institutions. In recent years, the Australian higher education industry has seen severe cutbacks [33]. Many governments have reduced the state's involvement in subsidizing higher education, enabling universities and other institutions to compete in an open market for new sources of money [34]. Financial restrictions will persist as government financing for higher education falls in the face of greater priorities for public expenditure, such as social welfare [35,36].

6.7. Declining International Student Enrollments

According to figures from ICEF Monitor, the percentage of foreign students attending American colleges and universities dropped from 28% in 2001 to 22% in 2014. In the United States, college and university deans anticipated a decrease in the number of international students enrolling in the autumn of 2017 by a further 40%. According to the National Student Clearinghouse Research Center, the number of undergraduate foreign students dropped by 15%, and the number of new international students dropped by 43% in the fall of 2020. Although the pace of fall is astounding, the Institute of Foreign Education reports that since 2015–16, new undergraduate international student enrollments have decreased each year [37]. The economic impact of international students in Canada is tremendous. As the enrollment of domestic students has decreased, the admission of overseas students has made up for the financial losses that Canadian institutions suffer due to the drop in domestic student enrollment. Admissions to Canadian institutions for overseas students are being impacted by the COVID-19 pandemic [38].

6.8. Curriculum Changes

One of the four important curriculum concerns that must be addressed immediately is a shift in the role of knowledge, as well as the development of conceptual understanding, the application of effective 21st century teaching and enhanced assessment techniques. Students in the twenty-first century will benefit greatly from the combination of these four aspects. Due to the enormous number of variables and the extended timescales, evaluating the educational impacts of curricular reform is notoriously difficult [39,40].

Education in the 21st century faces several challenges that compromise its development. This paper presents the key challenges for 21st century education at higher educational institutes. In recent years, the world has seen a decline in education levels, as well as enrollment numbers, as a result of inflation, a lack of funding and catastrophic events. Figure 6 presents a list of the 21st century education challenges considered in this study.

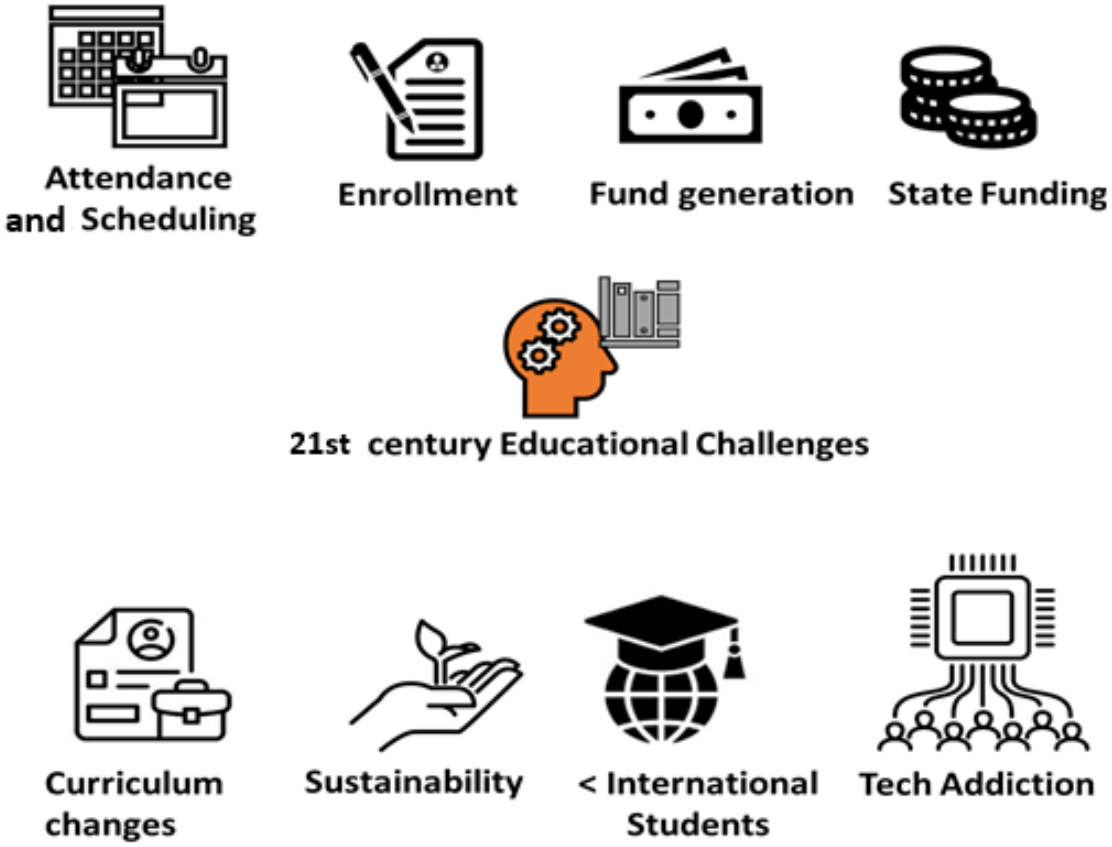

Figure 6. Key Challenges in 21st Century Education.

7. Validation of the Key Challenges in 21st Century Education

In the final stage, the results' reliability was assessed with Cronbach's alpha score using SPSS. Table 2 shows the results' reliability.

Table 2. Cronbach's Alpha Score for Key Challenges.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.894	0.896	8

It was observed that the overall Cronbach's alpha score of all eight parameters was 0.894, which is within the acceptable limits as per Cronbach's alpha theorem. Therefore, it can be concluded that the findings of this research are validated.

8. Critical Remedies in 21st Century Learning

This is the second survey that was directed toward the same experts who were initially contacted to participate in the first survey. There were only 155 respondents to this survey, of which 64.51% were over the age of 40, and of those 155 respondents, 38% were male, and 36% were female. There needs to be a variety of age groups in the responses so that the three generations can be represented. This study found that it was much more important to bring the traditional, transformational and new eras of learning together, and the results were obtained from all three groups, as shown in Figure 7.

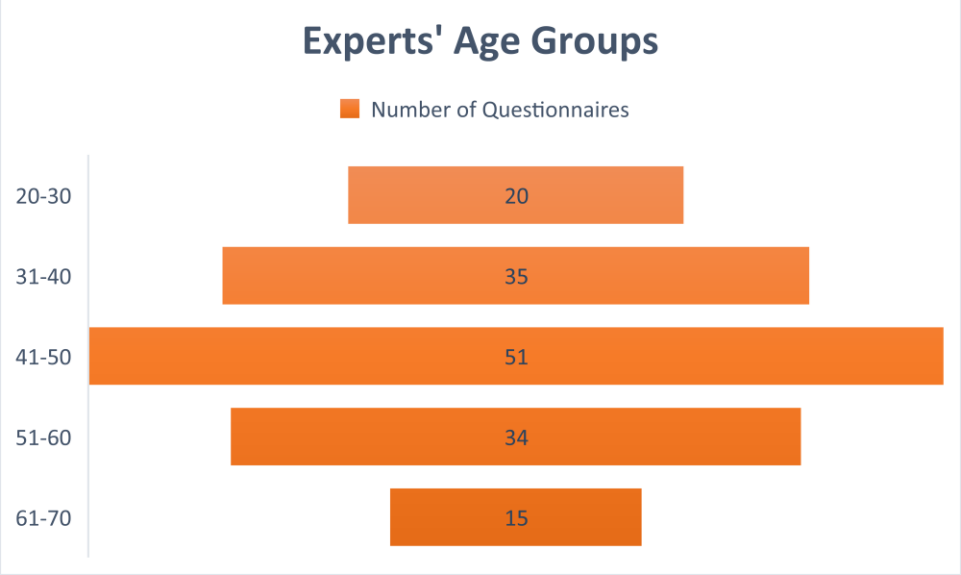

Figure 7. Age group of experts contributing to survey.

In addition, the age group was also an important factor in identifying and correlating the experience with the new generation. Figure 8 shows the experience level of the experts who filled out the questionnaire.

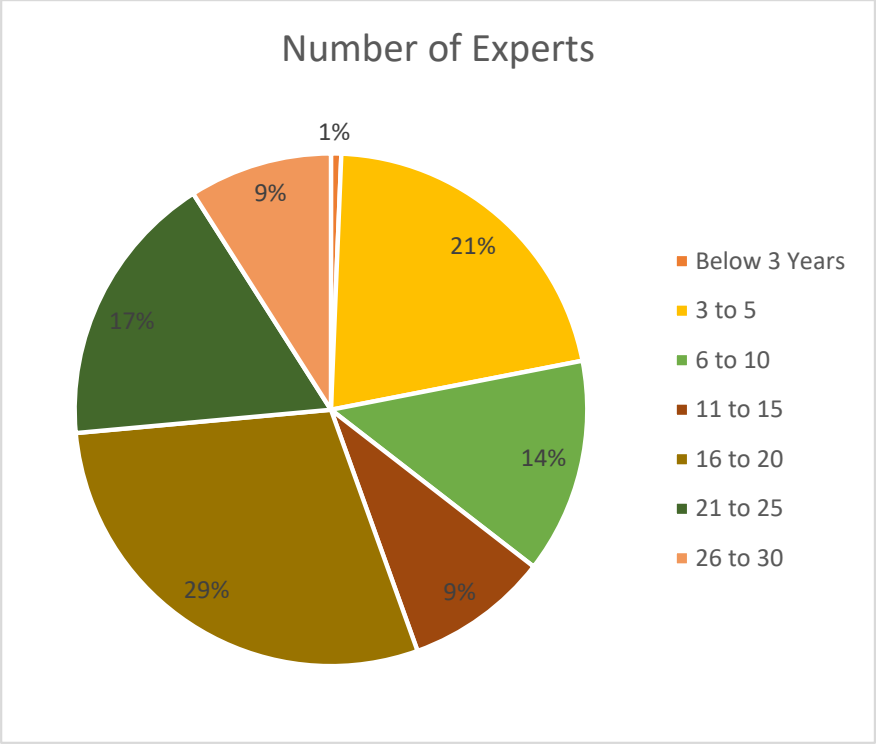

Figure 8. Experience of experts contributing to the second iteration.

The experience of the respondents ranged from over three years of experience to more than twenty years of experience for some of them. There was a strong correlation between the perception of younger people and the ability to address the challenges of the 21st century. By complementing the experience and best practices of adults and old educators and incorporating the best practices from both fields, an effective approach was developed. Most of the respondents had more years of experience. Almost 56% of the respondents had

experience of more than 15 years. Figure 9 shows the qualification level of the experts who participated in the survey.

Figure 9. Education level of experts contributing to the remedies' classification survey.

Figure 9 provides a breakdown of the qualification levels of the educational experts who made a significant contribution to this research to identify and validate the key challenges involved in educating students in the 21st century. The majority of respondents to the survey held doctorate degrees, which is interesting to note. However, they do hold Ph.D. degrees and currently serve as educators, even if their doctorate is not in the education field. A survey found that 19.35% of respondents held a graduate degree, while 16.77% held a bachelor's degree. Table 3 shows the suitable remedial measures against the identified challenges.

Table 3 shows the rank of suitable measures for 21st century challenges that can support mitigating the educational challenges of the 21st century. The top recommendation based on scores received from the respondents was to have incentive-based learning where the educational institutes and governments should provide incentives to students to attend higher educational institutes. After the massive economic effects due to COVID-19, parents are struggling to pay the fees of their students enrolled in higher educational institutes because, in lower grades, most countries are providing incentivized education for students. This is where government incentivization may be effective to encourage commercial developers to produce engaging and powerful educational games and learning environments [41,42].

This study also observed that the parents of students wish to enroll their students in accredited institutes. It is very important for the students to acquire a job; thus, the rank, recognition and reputation of the institute play a vital role in students acquiring job offers. It can also be observed that there should be an effective communication channel between the university and end users such as parents and students. It is very significant because close contact between these stakeholders is important. The universities should also initiate online programs to provide easy access to students. The connectivity level is very much enhanced after COVID-19, and it is significant to receive benefits from this connectivity. Students living in remote areas should benefit from online educational programs at subsidized rates. Most of the good universities and external institutes have already created open-access platforms offering online education [43,44].

Table 3. Critical remedies to address 21st century education challenges with their ranking.

Key Remedies of 21st Education	Score	Standard Deviation	Rank
Incentivize Learning	4.51	0.9410	**1**
Global Recognition and Acceptance	4.36	0.9322	**2**
Effective Communication	4.14	0.9787	**3**
Online Education and Globalization	3.92	0.8732	**4**
Adoptive and Updated Curriculum	3.92	0.9430	**4**
Equity in Learning	3.81	0.9030	**5**
Innovative and Continuous Assessment	3.76	1.0822	**6**
Experiential Learning	3.68	0.8744	**7**
Continuous Feedback	3.44	0.8893	**8**
Technology Learning and Integration	3.44	0.7990	**8**
Collaborative Learning	3.38	0.9755	**9**
Gamification	3.28	0.8953	**10**
Asynchronous Learning	3.22	0.8990	**11**
Critical Thinking	3.14	0.8798	**12**
Social-Media-based Learning	3.09	1.0992	**13**
Personalized Learning	2.99	1.1033	**14**

The curriculum has been a hot topic in 21st century educational challenges, as faculty and students have been resistant to adopting new courses and major curriculum changes [45]. Whereas 21st century education demands a new set of skills for undergraduate and graduate students; thus, it is very important to update and revise the curriculum. The revision should be aligned with the challenges of the job market and skill set demands. Equity in education is also very important in meeting the challenges of 21st century education because education is one of the crucial basic components for any student in any country. Thus, policymakers and government should give attention to these serious issues and design new policies to balance and maintain equity in education. Currently, few countries have adopted multiple syllabuses, and most of them are aligned with the financial condition of the students. The details of each remedy are discussed in the following section.

8.1. Incentive-Based Learning

There are generally two types of incentives for learning: inducements and supplemental rewards. As outlined in research position one, position two incentives can motivate children and teens to become interested in activities they might not have otherwise found appealing, and they can also motivate them to actively participate in these activities. The incentives can also be introduced to provide education for all, such as anyone who completes x number of assessments can receive a free voucher for any other course.

8.2. Global Recognition and Acceptance

There is a challenge that, often traditionally, online learning or social-media-based learning is not accepted widely. With innovative, feedback and assessment mechanisms, the courses and certifications acceptance must be made globally so that this mode of study becomes a success. Freedom of choice, in terms of the technology utilized, presented the largest obstacle at the level of the learning community. Students' attitudes toward technology, as a tool for their activities, were mixed. On the one hand, students argued that it was beneficial that they had a role in the technology choices because it allowed for student input. On the other hand, some students thought that they made too many application choices, which complicated their work and reduced its efficacy.

8.3. Online Education and Globalization

The first and utmost solution to major challenges for the 21st century is to have a global reach of educational knowledge and concepts. During COVID-19, it can be seen that online education is effective and can do the job that traditional education has been lacking.

8.4. Adaptive and Updated Curriculum

As we all are aware, 21st century education requires an updated curriculum that can adapt according to learning needs yet achieve learning objectives. Ensuring consistency in quality, across educational types and age groups, can contribute to a more equitable education system. By guiding and supporting teachers, it facilitates communication between teachers and parents.

8.5. Innovative and Continuous Assessment

There is a strong need for designing a method of assessment that can assess 21st century learners who have access to information at their hands, have lesser interest in theoretical learning and are usually assessed remotely. Additionally, there is a need to assess them continuously to adapt lessons according to learner needs and, possibly, redesign a whole lesson to enable learners to achieve learning objectives.

8.6. Technology in Learning

As 21st century education includes technology at its core, thus, it is a challenge to ignore the effective use of technology in learning. Newer generations are more adept at using smart technology; thus, the effective use of technology needs to be included in teaching, assessment and learning. It includes the inclusion of smart software, tools, gadgets, social media and even games for the delivery of lessons and courses.

8.7. Equity in Learning

In 21st century education, often it is hard for students to travel to places to learn; secondly, in most countries, gender-based access to education is common. Thirdly, in developing countries, students cannot attend lectures at prestigious universities. With online learning and other models in action, this gap can be ameliorated by allowing students to attend courses from anywhere in the world, and often it can be made free. Udemy, Coursera and other online teaching platforms are examples of what the globalization of content delivery can do.

8.8. Critical Thinking

21st century educators hold a responsibility to students to develop their skills in terms of looking at the environment and working on its sustainability. Research shows that modern day education requires that everyone must be aware of sustainability and challenges that the modern world faces in terms of climate change, industrialization, health care and all related disciplines.

8.9. Communication Skills

21st century education involves education in your hand, and often there is a generation that is raised behind mobile phones and tablets at home. These students struggle with communication; thus, there is a requirement to create an environment where all kinds of communication skills can be improved.

8.10. Asynchronous Learning

With the advent of newer approaches, people that were working or cannot attend colleges and universities can attend education institutes. Moreover, with the possibility of online learning, it also provides the advantage of having asynchronous learning. It is a proven fact that this kind of learning provides flexibility to learners, as well as its cost-effectiveness.

8.11. Collaborative Learning

Students collaborate on projects or assignments in small groups as part of a collaborative (or cooperative) learning style. In contrast to assigned group work, collaborative learning allows students to work independently on projects that contribute to a common objective. Instead of being handed over gradually, learning and concentration may be actively supported in this way.

8.12. Personalized Learning

When students receive personalized learning or experiences tailored to their learning needs, interests and aspirations, they are more likely to succeed academically. The results of personalized learning have been demonstrated to be superior. The result is content that is relevant, engaging, actionable and memorable.

8.13. Social-Media-Based Learning

It is believed that social media can improve students' academic achievement through the collection of data and information. To gather information for assignments, students use a variety of online platforms. Social media is primarily used for communication purposes. The use of WhatsApp and Students Messenger allows students to communicate at any time. Such platforms can be used by smartphone, tablet and computer users to exchange questions, make phone calls and watch videos. Social-media-based learning (SMBL) is the use of social-media-based platforms, such as Twitter, Google Plus, Facebook and YouTube, for learning purposes. It enables real-time interactive, participatory, and cooperative learning among people. Social media can alternatively be characterized as a mobile- or web-based, highly participatory platform where individuals and groups can co-create, discuss and modify user-generated content. It is no secret that social media dominates the life of the majority of people. The predominant medium for communication and social interaction is now social networking sites. Social media encourages autonomous research and decision-making, preparing pupils for life after school. These social media abilities can be led and improved to yield better learning outcomes and critical awareness when they are reinforced in a classroom setting.

8.14. Experiential Learning

An important aspect of experiential learning is learning-by-doing. To apply the ideas and information they have gained in the classroom to real-world circumstances, students must engage in practical experiences and reflection. By giving students a sense of success, experiential learning boosts their self-esteem and motivates them to study.

8.15. Gamification Learning

By incorporating game-based elements, such as point scoring, peer competition, teamwork and score tables, into educational settings, gamification engages students, helps them assimilate new information and helps them test their knowledge.

8.16. Continuous Feedback

Learning must be continuously assessed to keep track of learning objective achievement, as well as making sure that the learning path is completed by students. It will allow the provision of continuous feedback to students and content creators to act while the lessons are taking place. It is one of the keys to achieving the above-mentioned learning patterns.

All the suggested remedies to meet the challenges of 21st century education are presented in Figure 10.

These challenges require new and innovative solutions, especially that require less traveling and global access. Moreover, it is recognized that there are different types of learners that need to be catered for. Thus, this paper suggests the following key areas to be focused on for meeting the highlighted changes in the last section.

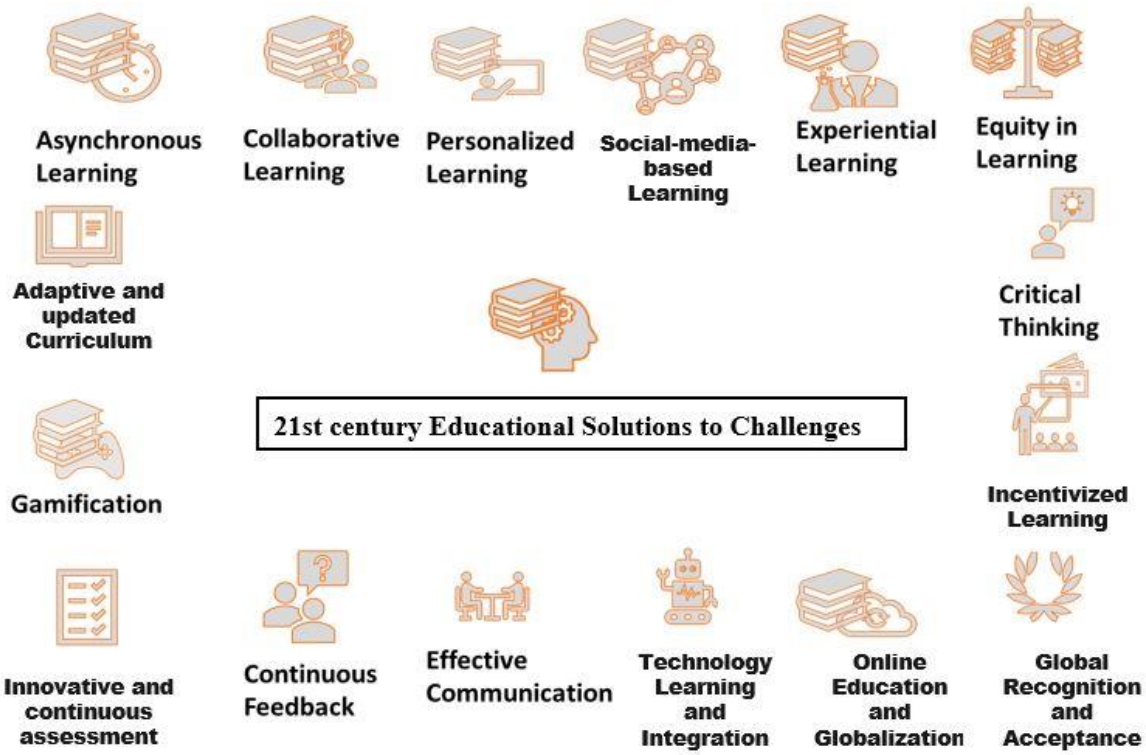

Figure 10. Key remedies to challenges in the 21st century.

9. Validation of the Critical Remedies to Challenges in 21st Century Education

In the final stage, the results' reliability was assessed with Cronbach's alpha score using SPSS. Table 4 shows the results' reliability.

Table 4. Cronbach's alpha measure of the reliability of the results.

Reliability Statistics Impact Level		
Cronbach's Alpha	**Cronbach's Alpha Based on Standardized Items**	**N of Items**
0.844	0.848	16

It was observed that the overall Cronbach's alpha score for all sixteen parameters was 0.844, which is within the acceptable limits as per Cronbach's alpha theorem. Therefore, it can be concluded that the findings of this research are validated.

10. Contribution of Findings to United Nations Strategic Development Goals

It is also important to highlight the contribution of the findings of this paper to the United Nations Sustainable Development Goals (UN-SDGs). Figure 11 presents the findings' contribution to the SDGs.

It can be analyzed how the actions of teaching and learning are going to impact the quality of education. On the basis of the estimates of these 59 million out-of-school children, two in five children will never enter a classroom. It is clear that this gap must be closed, despite the Sustainable Development Goals addressing quality and equity in education more explicitly. All of the actions, such as supporting teaching and learning through online teaching and asynchronous learning, are going to reduce inequalities. It will also allow women's empowerment and access to education for all genders. Educating the mind, unlocking the imagination and cultivating self-respect are the goals of education. As a result, we can make a considerable contribution to society, and our prosperity depends on it. The ability to learn is beneficial to every human being, and everyone should have the opportunity to do so.

Figure 11. Impact of findings on SDGs.

11. Conclusions

The global COVID-19 pandemic disrupted our way of life and introduced new challenges for higher education. Universities must cope with enrollment, finance and student support concerns in addition to transitioning their on-campus programs to virtual settings. Although, it is too soon to estimate the long-term repercussions. Lectures must be interactive, captivating, collaborative and thought-provoking while stressing the mastery of both reading and numeracy abilities to support this perspective on education. Additionally, students should have a choice in how they learn knowledge and display it in accordance with their requirements and preferences. Additionally, technology usage should be interesting, efficient and responsible to improve the learner's experience. Students should also be taught how their education will affect their future and global impact; for instance, numeracy skills should lead to financial and economic understanding.

There are several challenges related to the 21st century education system that need to be addressed by researchers. In the majority of these studies, authors addressed two to three challenges, but this study consolidates all of these challenges, as well as lists new challenges that have been extracted from informal interviews with established educators. Technology and social media have advanced significantly over traditional teaching methods in the 21st century, and students of the modern age cannot be engaged by traditional teaching methods. Second, in most countries, the amount of funding allocated to education among states and at the national level has decreased significantly as a result of inflation. Enrollment has also decreased due to travel challenges and an increase in the cost of education. In most higher education institutions, the curriculum is outdated and needs to be restructured radically. Attendance in classes has been reduced as a result of a lack of attention, a technological addiction and outdated teaching methods. To meet the challenges of the 21st century, a modern-day approach is required.

In general, educating students in accordance with a 21st century perspective on education should result in generations of knowledgeable individuals, self-directed learners, effective communicators and globally thoughtful folk with the capacity and desire to change the world in novel and impressive facets. The transformation of universities into a scenario where technology is an integral element of the same will become an unavoidable process. Furthermore, this perspective highlights the necessity to reconsider how these modifications may impact the learning experiences of students.

12. Limitations of the Study

This study was limited to higher educational institutes of developing countries. The data were collected from experts from Pakistan and Saudi Arabia. The ranks of the challenges for 21st century was discovered. Similarly, the remedial measures to meet the highlighted challenges were presented. The higher educational institutes were engineering and social science program-offering institutes. It did not cover medical institutes.

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