Smart Society : Community Service and Empowerment Journal
Volume 4, Issue 2, 55 - 69.
e_ISSN: 2807-5757
https://www.journal.foundae.com/index.php/smartsoc/index

Preparing for the Future of Education: Adapting to the Technological Revolution and the World of Work

Karim Noura *
Melbourne Polytechnic University,
AUSTRALIA

Article Info

Article history:

Received: October 2, 2024
Revised: November 30, 2024
Accepted: December 30, 2024

Keywords:

future education;
future job;
technological revolution;
technology in learning

Abstract

The rapid advancement of modern technology, particularly automation and digital communication, has transformed various industries, including education and employment. As automated tools and robotics replace human workers in several sectors, the demand for a highly skilled workforce continues to grow. However, there remains a critical gap in the preparedness of young professionals for future job markets. This study aims to analyze the evolving educational and workforce landscape by examining industry trends and the role of key stakeholders in shaping educational policies. Using a qualitative approach, this research gathers insights from experienced educators and industry professionals to identify essential skills and competencies required in the digital era. The findings highlight the urgent need for adaptive and interdisciplinary education models that bridge the gap between traditional curricula and industry demands. This study underscores the importance of collaboration between educational institutions, policymakers, and industry leaders to foster a future-ready workforce.

To cite this article: Noura, K. (2024). Preparing for the Future of Education: Adapting to the Technological Revolution and the World of Work. *Smart Society : Community Service and Empowerment Journal, 4*(2), 55-69

INTRODUCTION

The rapid evolution of modern industries and technological advancements have created an urgent need for educational systems to adapt (Haleem et al., 2022; Legi et al., 2023). As global industries continue to shift due to automation, artificial intelligence, and digital transformation, education must evolve to ensure students acquire the necessary skills to succeed in future job markets (Tangalakis et al., 2024). While Australia, particularly Victoria, has been at the forefront of educational innovation, it is essential to examine whether these reforms effectively prepare students for the global workforce.

The Australian school curriculum is undergoing significant transformations to equip students with knowledge and competencies that align with the demands of emerging industries. Victoria, Australia, is widely recognized as a global leader in education, offering a system designed to foster independent and confident learners (Victoria, 2012). The curriculum aims to develop creative and active individuals who are well-informed and capable of thriving in a rapidly evolving, technology-driven world. To accommodate the diverse needs of students, the curriculum incorporates a range of teaching methodologies, including directed learning, e-learning, independent study, individual projects, and collaborative research (Moss et al., 2019). These approaches ensure that students gain essential competencies such as critical thinking, problem-solving, digital literacy, and adaptability. Furthermore, interdisciplinary learning has become an integral component of modern education, enabling students to integrate knowledge from various subjects and apply it to real-world challenges (Grandgirard et al., 2002; Li, 2023).

* **Corresponding author:**
Karim Noura, Melbourne Polytechnic University, AUSTRALIA. ✉ kn4education@gmail.com

In addition to diverse teaching strategies, various assessment methods are employed to measure student progress and ensure academic standards are consistently maintained (Ozan & Kıncal, 2018). National and state testing programs provide benchmarks for evaluating student performance while also informing curriculum adjustments (Herman et al., 2010). Alternative assessment techniques, such as project-based evaluations, peer assessments, and portfolio reviews, are increasingly being implemented to capture a more comprehensive picture of student learning outcomes (Mehmet et al., 2018). Moreover, the curriculum reforms emphasize the importance of collaboration between educational institutions, industries, and policymakers (Esangbedo et al., 2023; Gouëdard et al., 2020). Schools are encouraged to establish partnerships with businesses and technology firms to offer students hands-on experience, internships, and industry exposure (Flynn et al., 2016; Galbraith & Mondal, 2020). This approach bridges the gap between theoretical knowledge and practical application, ensuring that students are well-prepared to transition into the workforce.

This study analyzes curriculum transformation, assessing its effectiveness in equipping students with necessary competencies such as problem-solving, critical thinking, and adaptability. Furthermore, this research explores existing gaps and potential improvements in aligning education systems with industry demands worldwide. The purpose of this study is to evaluate the extent to which Australia's educational reforms align with the demands of the future workforce and to compare these strategies with global best practices. By identifying strengths, weaknesses, and potential areas for improvement, this research aims to contribute to the ongoing discussion on how education systems can be better structured to meet the evolving needs of industries and societies worldwide.

DISCUSSION

Future Schools in Victoria, Australia

The Victorian Department of Education and Training has identified five key drivers to improve school design and innovation (Cleveland et al., 2018):

1. New curricula with innovative teaching and learning methods and activities
   The school curriculum in Victoria is continually evolving to incorporate new subjects and ideas, such as science, technology, robotics, and sport. New workspaces, teaching facilities, and assessment methods are being introduced to support this evolution.
2. Inclusive education designs
   The Department is working closely with school communities, private and public agencies, to improve the support provided to students with special needs. Schools are being equipped with facilities that cater to all students' needs, including “accessible movement pathways, hearing augmentation systems, and consultation or therapy rooms”. Inclusive education is further supported by special spaces like sensory gardens, respite spaces, kitchens, laundries, and other facilities.
3. Schools as community hubs
   School facilities are now being utilized more as community assets, with community groups using them for cultural and sporting activities outside of school hours. Gymnasiums, outdoor courts, playing fields, swimming pools, early learning centres, and maternal and child health facilities are now more accessible and attractive to local community groups. This shift is helping to improve school-community relations and create a more favourable teaching and learning environment for students.
4. Outdoor learning spaces
   Schools in Victoria are encouraged to use their outdoor spaces as learning spaces, taking into consideration factors such as cultural, location, climate zones, suburban, and rural conditions. Such naturalistic environments can have a positive impact on both students and school staff.
5. Big changes ahead for education
   In light of the rapidly growing technology, life aspects are changing not only in Australia but around the world. Modern technology is advancing in various fields, including civil and military

ways, communication, transportation, agriculture, and other industries. However, the question remains: Are we, as a community and in education, ready for these changes?

According to a study published by Professor Tricia McLaughlin in Melbourne in 2020, there are four key points to consider in preparing current students for future jobs and ensuring that our education system (McLaughlin, 2020), from primary school to university levels, is equipped to do so. Firstly, modern learning spaces that allow for face-to-face or virtual collaboration will be necessary in addition to traditional classrooms. Secondly, modern technology has become an essential tool in education, and it is vital to provide students with the best technology to help them use it effectively. McLaughlin stresses the importance of embracing technology and utilizing it to our advantage. Thirdly, teachers must individualize learning plans to meet the needs of various students. Students should be able to learn and thrive at their own pace, and they should be encouraged to take more responsibility for their learning. Classrooms of the future should focus on student engagement in learning, inquiry-based approaches, curiosity, imagination, and design thinking.

Finally, modern education should focus not only on what students learn but also on what they can do. Education should not rely solely on formal tests to assess students' progress and learning. Instead, knowledge and skills need to be demonstrated in real-world situations. Assessment methods need to be revised, and data should be collected based on evidence of ability and competence. In conclusion, as technology continues to advance rapidly, our education system must adapt to prepare students for the future workforce. By providing modern learning spaces and technology, individualized learning plans, and focusing on practical skills and abilities, we can ensure that students are well-equipped to face the challenges of tomorrow.

Modern Education versus Classic Education

Teaching styles and assessment methods have undergone significant changes over the years. Classical education relied on a directed learning style and a single test for all students, while modern education emphasizes key concepts, the ability to learn, and compatibility with learning and applying knowledge.

In the past, traditional or classical education was delivered through recitation and memorization, utilizing textbooks and blackboards (known as the Chalk & Talk style). However, modern education leverages technology and the influence of social media, relying on tools such as the internet, smartboards, and e-books. These innovations enable modern education to personalize and customize students' learning experiences. With more resources available for both teachers and students, modern education can better address students' needs and offer more opportunities for creativity, problem-solving, and employment.

Unlike the classical approach, modern education prioritizes interactive methods and collaboration, encouraging students to be productive in their learning. Sonia Jackson's 2012 study on new teaching methods concluded that both traditional and modern education methods are effective and useful (Bobalová, 2015). However, it is important to recognize when to use traditional methods and when to try new, innovative ideas.

Practical Education and the STEM Programs for Future Jobs

In the early 1990s, math teachers were advised to incorporate practical activities to make their classes more engaging and enjoyable. As a math teacher, my first practical activity cost me over ten dollars to purchase ice cream for my grade nine students, who were learning about algebra and linear relations. I asked them to estimate the distance from the classroom to the canteen, and students who gave a close answer would receive a free ice cream. Students worked in small groups to measure their feet or paces, calculated averages and walked toward the canteen to count their steps and do calculations. While we all enjoyed the ice cream, other maths teachers were unhappy because they believed I had bribed the students.

In the early 21st century, teachers were advised to create learning activities across various subjects, such as sports, physical education, food preparation, science, woodwork, metalwork, and

mathematics. It took time for teachers to accept and get used to the idea, but the results were good, and students enjoyed hands-on activities. Parents also liked the idea and offered to help. It also provided an opportunity for single discipline teachers to discover the linkages to mathematics.

A few years later, Australian universities and educational groups like the MAV and AAMT started to circulate ideas about STEM programs. These programs aimed to encourage teachers and students to participate in hands-on activities that connect what they learn in the classroom to real-life situations, and to develop their problem-solving skills. Most Australian schools now run STEM programs as one of their essential educational programs for students. Some schools have even added "Arts" to the program, creating the STEAM program.

However, natural and non-natural disasters such as bushfires, floods, and the COVID-19 pandemic have affected the education system and STEM programs. Despite this, community groups still expect more support from schools to help students become flexible learners, lifelong workers, and problem solvers.

In a study by Dr. A. Finkel in 2020, it was noticed that the skills developed in any STEM program cover a broad range of trades and professions (Finkel, 2020). Students from all various ethnic groups in Australia, for both university graduates and vocational qualifications, study STEM. However, female workers remain under-represented in STEM areas and management roles.

In the late 1990s, major manufacturing companies and various business groups in Australia supported programs that encouraged teachers to spend up to six months working in different departments to expose them to the needs of industries (Consiglio, 2014). Additionally, in collaboration with secondary education, these business groups continue to run "work experience" programs where students as young as 16 spend two weeks working in various departments and workplaces. This helps them gain insights and ideas about their future jobs, and it also assists them in answering the inevitable question, "Why do I need to learn this?

World-wide job disruption

With the massive changes in the global economy and technology, the types of future jobs will be impacted and will continue to change worldwide, not just in Australia. The emerging technologies, such as robots, automation, 3D printing, and artificial intelligence, will affect the workforce and job types. Certain industries will be affected more than others, and companies should manage the change by utilizing self-management policies, such as in-house retraining programs for workers, rather than employing new staff.

Jobs in all industries, from low-class jobs such as taxi drivers, delivery personnel, and waitresses to high-level jobs such as bank workers, agriculture, engineering, legal aids, and health advisory, are at risk of disappearing. Machines such as drones, robots, sensors, cameras, and driverless cars will replace some of these jobs.

However, certain skills will remain critical in the future and cannot be replaced by robots or machines, such as emotional intelligence, adaptability, creativity, and critical thinking. Jobs and skills in areas such as education, health, disability services, and age care centres are expected to expand.

In an interview with Nick Whigham, Senator Murry Watt from Queensland, Australia, urged government bodies to collaborate closely with industry, union groups, and educational institutes to ensure that the population is well-prepared for future jobs. However, government planning and advisory groups, along with industries and business groups, should have a good understanding of where jobs are growing and where they are declining.

So, should we be concerned about our kids' future jobs? The answer is both yes and no. In the future, workers must be adaptable and ready to change jobs. During the 1990's, it became common place in industry to hear the statement "Life long careers are of the past. Be ready to change career direction at least three time in your lifetime" (Consiglio, 2014). Additionally, workers must be willing to improve their skills and learn new ones.

Coding in the classroom

A common question that arises from students all around the world is: Why do we learn what we learn at school? I asked my teachers this question nearly sixty years ago, and my own students have been asking me the same question since I started teaching more than 40 years ago. We all believe that learning at school is about gaining knowledge on various topics and developing skills to apply that knowledge.

In Australia, schools have recently introduced a new "Digital Technologies" syllabus for students in both primary and secondary school levels. Students will be assessed against this new syllabus starting from grade 3, which is around 8 years old. As parents and teachers, we all know that young kids are very good at using electronic devices to play games or navigate the internet. However, we would like them to learn how to use these devices as educational tools that enhance their learning at all levels and understand how they work.

According to J. Blannin's research study in 2017, Fluency with digital technologies means understanding how computers work, how they might be used to meet our needs, how we might repair or modify them and yes, even how to write computer programs to control them. This is a new type of fluency for the 21st Century (Blannin, 2022).

Learning about digital technology is important because nowadays, all jobs require a basic knowledge and skills of Digital Technologies, even a delivery boy needs to know how to use business applications and a navigator in his mobile phone. When students finish school, they will enter a new world that is way different from the world that we entered when we finished school, even just ten years ago. Technologies have already invaded and affected all aspects of our life from homes to schools and workplaces. Therefore, collaboration between all parties (students, parents, and educators) is essential to help the younger generation to be ready and well-prepared for all types of future jobs.

In 2013, the education department in the U.K. introduced a Coding syllabus for all school levels. Students were encouraged to consider Digital Technology as a core subject that enhances their learning and helps them to develop problem-solving skills. In contrast, the study of Digital Technology is not compulsory in the U.S., but a number of organizations and educational groups have established digital resources for self-learners. They also provide online lessons that help students to develop their creativity and critical thinking skills, in preparation for future workplaces.

With this massive development and changes in lifestyles and workplaces, an interesting question arises: How are different countries tackling the changes in future jobs?

World-wide efforts to prepare for the future work-force

Numerous countries worldwide are making significant and courageous efforts to evaluate their education systems in order to equip students with the necessary skills for future employment. Scholars and policymakers are working diligently to devise tactics and initiatives that empower young individuals to become lifelong learners and critical thinkers. Their emphasis is also on preparing students to confront emerging challenges and issues that impact diverse economic sectors and prevailing lifestyles.

In the United Sates

Studies, in the United States, are highlighting the urgent need to review and reform the higher education system. It is essential for students to establish meaningful connections between what they learn in school and the challenges they will face in real-life situations. To ensure stability and coherence of American society, the higher education system needs to be accessible to all students, irrespective of their social or ethnic backgrounds. Achieving this goal requires the cooperation of government agencies, community groups, business communities, and education sectors to address the lack of alignment between educational programs and the world of work and real-life situations (Srinivasan, 2022).

Furthermore, the global pandemic and other issues have demonstrated the need to carefully evaluate the role of education in empowering students to be innovators in a rapidly changing world. Policymakers and various community groups must be prepared to handle emerging issues,

especially given the significant progress and domination of modern technologies (McConnell & 't Hart, 2019).

Leaders and educators must plan for future problems, technologies, and education to narrow the existing gaps and disparities among citizens and community groups. Technology and other resources should be used to serve the broader community's development and the welfare of all citizens, rather than dictating the nation's direction. Educational programs should provide students with knowledge and skills in all areas of education, such as Mathematics, Sciences, Arts, Artificial technology, and communication skills. Stakeholders must support schools and social groups in preparing students for future jobs and encouraging active citizenship. Finally, studies have shown that The best way to grow the economy is to invest in people (Srinivasan, 2022). A collaborative effort is required between education and industries to lead the American nation to ongoing progress and stability.

In China

Recently, the massive economic growth in China has become the subject of worldwide media attention, as well as that of policy makers. However, China is taking great steps to improve its education system to prepare its young generation for the future. China has a bold long-term vision for investing in education to lift its people out of poverty and prepare them for the global economy, said Vivian Stewart, Vice President of the Asia Society in 2023. Government bodies and policymakers are working in various directions, primarily in three areas: Basic Education, Vocational Education, and eLearning (Yu et al., 2014).

a. Basic Education
   1. Modernize the education system and give more support and professional development opportunities to teachers.
   2. Put an intensive focus on Mathematics, Science, and internationally oriented subjects in high schools.
   3. Move beyond simply acquiring knowledge to promote the ability to think independently and apply knowledge in new life situations.
   4. Engage all students regardless of their socio-economic background or where they live, whether in cities or rural towns.
   5. Revise the assessment and examination process to encourage innovation.
   6. Educate students and prepare them for success in a knowledge-intensive, high-tech, and globalized economy.

b. Vocational Education

   Business leaders and economic experts are pleased with the support provided by Chinese agencies to promote high-quality vocational education programs. This push will help support the manufacturing sectors and meet the rising demand for upgrading entire industries. The following points are noteworthy:
   1. Improve schooling conditions.
   2. Provide high-quality training skills that are attractive to students.
   3. Offer courses that fit market demand and create more job opportunities.
   4. Accommodate craftsmen who can turn their ideas into reality.
   5. Offer higher-level courses that enable students to progress through the academic ranks.

c. eLearning

   Distance education or correspondence schools have been available for rural students in China for a long time. This type of education is also known in Australia, where students receive their learning resources and submit their homework and assignments by post. However, with the huge development of technology and digital communication, China, like many countries around the world, has moved to online education to reach students who cannot attend school or have face-to-face learning. In recent years, due to the COVID-19 pandemic, there has been a massive jump in online education. Therefore, the whole education system has faced a huge challenge to ensure that students receive a reasonable education.

1. Schools had to offer quick PD (professional development) sessions to their teachers and administration staff to manage the new situation. The education department and other agencies offered help, and online training courses became available for teachers, parents, and students.
2. In this massive change in education, the whole nation needs a powerful internet and a high level of telecommunication service.
3. A new classroom environment has been created, where students use electronic devices instead of workbooks, online textbooks, or eBooks instead of physical books. Smartboards or smart TVs with massive screens have been installed in each classroom. Students are now expected to submit their work online. Every teacher carries a laptop where all resources are accessible online.
4. All types of communication between administration staff, teachers, parents, and students are now online.

d. Global Challenges in Education
In this new environment of modern education, all Chinese colleges and universities have started to follow the worldwide trend of online education. Online courses are now available for Chinese students everywhere in China. The Education Department and Chinese authorities face global challenges to compete with international universities that are targeting Chinese students to pursue online studies.

Europe

The European countries are sharing global concerns about significant changes in skills and occupations that are affecting workforces in all areas. The hardships in all divisions of workforces are caused by globalization, demographic and climate changes, digital and automation growth, and the depletion of natural resources. All these changed and new life conditions have been exacerbated by the COVID-19 pandemic and lockdowns.

The EU is leading a major campaign to provide support to partner countries in their efforts to drive forward education and training reforms with the support of the United Nations' Sustainable Development Goals. In response to the current situation, the European Commission is working closely with the education department and other government agencies to implement major reforms that focus on inclusion and gender, digital transition, and higher education, which includes the quality of education and better work conditions for teachers.

The important role of education is dominant in European culture. Young people, in particular, believe that good education helps them acquire the knowledge and capabilities that develop their personal and professional skills and prepare them to enter the workforce in the future. RAND Europe, commissioned by the European Parliament, published a study in 2022 that presents a set of recommendations for EU policymakers that could help the EU education and youth sectors prepare for future jobs.

The study focuses on the following key issues:

a. Student-centred learning and flexible pathways
b. Inclusive digital learning
c. Targeted investment in early years
d. Socioemotional development and soft skills
e. Strengthening the teaching profession

To address these key issues, the study suggests a set of recommendations:

a. Personalized learning policies could be successfully implemented across all scenarios. However, they may only achieve some of their objectives or be targeted at certain population segments, depending on the level of funding available and the prevailing socio-economic environment.
b. Inclusive digital learning could be widely adopted and provide scope for educational inclusion and is likely to be most successful where there has also been investment in digital infrastructure.

c. Short-term solutions that focus on reacting to the needs of the labour market, rather than developing more resilient skills, are less likely to involve targeted investment in early years or socio-emotional development.
d. Reinforcing the teaching profession is a key enabler for all the other policy options that may require changes to working patterns for teachers, as well as changes to how and what they teach.

In an additional effort, the ESU (European Students' Union) supports the EU in its effort to reform the education system in Europe and asked to be involved in that process. The ESU published a statement in 2018, which focused on the following points:
a. Education must be prioritized in government investments.
b. Support exchange programs for students between EU member and non-member countries.
c. Increase the mobility of students and graduates in Europe, as well as enhancing graduates' opportunities for work.
d. Carefully develop the proposed European Universities Networks, especially in terms of sharing data and personal information, funding, tuition fees, and creating work opportunities.
e. Enhance teaching and learning of a wide range of subjects, including vocational education.

Finally, the ESU highlights the absolute need to include all stakeholders in the EU in the huge process and reform of education programs and employment policies that will support future generations.

Asia Society: Teaching for Global Competence in a Rapidly Changing World

Educators and education systems worldwide are recognizing the importance of preparing students for success in a rapidly changing and complex world. This has led to a global consensus among organizations like the United Nations (UN) and the Organisation for Economic Co-operation and Development (OECD) that education should prioritize global citizenship and global competence.

The OECD and the Centre for Global Education at Asia Society have collaborated with experts, educators, and stakeholders to define global competence for primary and secondary education. The Centre has also supported educators in incorporating global competence into their teaching practices. Together, these organizations have published a joint work called "Teaching for Global Competence in a Rapidly Changing World.

This publication introduces a new framework for global competence developed by the OECD, which aligns closely with the definition created by the Centre for Global Education. It offers practical guidance and examples to help educators integrate global competence into their existing curriculum, instruction, and assessment methods.

The Organization for Economic Co-operation and Development (OECD) and the Centre for Global Education at Asia Society have identified four key components of global competence. These components define globally competent youth as individuals who:
1. Explore issues of local, global, and cultural significance, going beyond their immediate environment to investigate the world.
2. Recognize, understand, and appreciate different perspectives and worldviews held by others.
3. Communicate ideas effectively and appropriately with diverse audiences, engaging in open interactions across cultures.
4. Take action for the collective well-being and sustainable development, both locally and globally.

These four components serve as the basis for assessing global competence in the 2018, PISA test. They also offer a roadmap for educators and education systems to integrate global competence into their teaching approaches, allowing students to develop the necessary skills and understanding to thrive in an interconnected world.

Educators play a crucial role in promoting global competence among students. Here are the key implications for educators and education systems:
a. Educating for global competence is practical and achievable for teachers of all subjects and age groups worldwide. It is developed through active learning in the classroom, where students

apply their knowledge to real-world issues alongside traditional teaching methods. Importantly, teaching for global competence does not require a completely new curriculum but rather the integration of global issues into the existing curriculum. This can be achieved through instructional strategies such as debates, discussions, analysis of current events, play-based learning, service learning, and project-based learning.

b. For education systems, empowering teachers as advocates and ambassadors is essential in spreading global competence beyond individual classrooms. Whole-school engagement strategies should be developed to foster a culture of global competence throughout educational institutions. Professional development for educators is crucial in scaling global competence and ensuring that all students, particularly those from marginalized backgrounds, have access to it. Additionally, policy changes can be informed by the results of assessments like PISA 2018, which provide valuable insights into strengthening education for global competence and building teachers' capacity in this area.

Resources for developing global competence at scale, such as professional development opportunities and collaborative platforms, are available through organizations like the Centre for Global Education. However, ensuring access to professional learning for all teachers remains a challenge that must be addressed to transform teaching, classrooms, and schools. Addressing this issue will ultimately benefit all students, equipping them with the necessary skills and understanding to thrive in an increasingly interconnected world. Educators play a crucial role in promoting global competence, and education systems must support and empower them through professional development and systemic changes to enhance student learning outcomes.

In Indonesia

In this era of modern technology and rapid global communication development, Education Technology (EdTech) is compelling educational authorities and institutions to prioritize students' needs. The goal is to equip them for future employment and to foster a lifelong learning mentality that enables them to adapt their knowledge and skills to the swift changes across various industries and fields.

Reports indicate that Indonesia's education landscape is increasingly integrating technology into daily routines, with Indonesian students ranking among the world's highest users of educational technology (as stated in a 2018 research paper by Cambridge International). Recently, Indonesia has made significant strides in enhancing its education system across both primary and higher education levels. Notable steps taken include:

a. Accompanying the decentralization of the education system has been a substantial rise in education expenditure, estimated to have increased by 200% since 2002, with a particular focus on technology and communication.
b. Indonesia has made remarkable progress in achieving gender parity in education since 1975. The enrolment of female students now matches that of their male counterparts.
c. Indonesian students are actively encouraged to participate in various e-learning programs, particularly catering to working students and those residing in rural areas.

Nevertheless, teachers across all levels require increased support to hone their teaching skills and knowledge. This empowerment is essential for them to become effective educators capable of guiding students through current and future shifts in professional skills and academic domains. (Siahaan, 2021). Recently, it is remarkable that the Indonesian authorities are collaborating closely with local and international organizations, including the UNESCO Institute for Statistics and the World Bank, to comprehensively assess and revamp their education system. This transformation aims to accommodate the significant surge in the Indonesian student population amidst rapid global changes, particularly the advancements in modern technology, telecommunications, and social media. The report emphasized the following key points:

1. Indonesia necessitates an education and training system capable of enhancing citizen well-being, augmenting human capital, and attaining economic and developmental objectives.
2. Substantial strides have been made in Indonesian education, including substantial advancements in enrolment with gender parity, and a decentralization effort that was accompanied by heightened education expenditure.

3. Despite these noteworthy advancements, there remain significant hurdles concerning student learning levels and learning inequalities. A majority of students do not attain the national learning benchmarks set by Indonesia. Greater efforts are required to support marginalized students, particularly those hailing from impoverished backgrounds, residing in remote regions, or facing disabilities.
4. Indonesian students must acquire more robust educational foundations and equip themselves with skills pertinent to the job market. This empowerment will enable them to contribute to Indonesia's overall productivity, economic growth, and prosperity.

To propel education reforms and align outcomes with President Jokowi's vision, Indonesia can contemplate the following strategies:

1. Ensuring universal access to quality early childhood education: A mandatory two-year period of high-quality early childhood education can be established, ensuring all children start school primed for learning.
2. Prioritizing equitable learning opportunities: Ensuring that no child is left behind, especially those from disadvantaged backgrounds or with disabilities.
3. Identifying and addressing learning disparities: Student assessments can guide educators and school administrators in providing targeted support to those who require additional assistance.
4. Selecting, preparing, and supporting educators: Well-trained and motivated teachers are paramount to enhancing student learning. Indonesia should recruit the finest teaching candidates and provide comprehensive support before and during their teaching careers.
5. Strengthening accountability mechanisms and local-level reporting: Enhanced reporting and accountability at the regional level can direct support and resources where they are most needed.
6. Fortifying educational resilience: Indonesia can invest in online teaching and learning infrastructure, data storage systems, and disaster-resilient facilities, ensuring continuous learning during current challenges such as the COVID-19 pandemic and potential future crises. (The World Bank publication November 2020)

Along with other Asian countries, Indonesia is currently participating in the Transnational Education program, which was established and is supported by UNESCO and the Council of Europe in 2007. The TNE program aims to bring about meaningful changes and impactful improvements in education for both students and institutions in the participating countries. It also focuses on:

a. Capacity building and institutional development
b. Developing teaching capacity in institute TNE’s and strengthening the academic talent pool in countries
c. Enhancing student's experience and improving graduate employability
d. Enhancing research capacity
e. Reputational value
f. Building sustainable communities and student development.

Overall, continuous effort and support are necessary to ensure that Indonesia's education system remains up-to-date with the rapid and ongoing changes in technology and educational concepts. This will ensure that Indonesian students are well-prepared for future opportunities and jobs.

In Singapore

Singapore is one of the most developed countries in Southeast Asia, with a strong emphasis on education. Education is considered crucial to prepare the younger generation for the workforce and to build a robust economy. However, with the rapid advancement of modern technology, including automation and artificial intelligence, many jobs are at risk of being replaced by machines and algorithms. Nevertheless, new opportunities for jobs and industries are also emerging. To tackle these changes, the Singaporean government, along with educational institutions and private

businesses, is collaborating to develop new educational programs and strategies. Policymakers are focusing on four main areas for future plans, programs, and policies:

a. New methods of teaching: With new technologies and pedagogies emerging, educators are exploring innovative teaching methods that can better prepare students for the future workforce. Modern teaching approaches should focus on students' deep understanding of learning concepts that enable them to make connections between different elements of the curriculum, rather than simply testing and grading them.
b. STEM programs: Science, technology, engineering, and mathematics (STEM) programs are increasingly essential in a world that is becoming more technologically advanced. These programs are designed to equip students with the skills they need to succeed in the digital age and to prepare them for a global future with an entrepreneurial spirit.
c. Advising on future jobs: Policymakers and educators are working to anticipate the jobs that will be in demand in the future, and to provide guidance and advice to students as they plan their career paths. Additionally, educational institutes and business sectors are developing work-experience programs for middle-school students to gain practical experience before making decisions regarding higher education and work choices.
d. Expanding the curriculum: Curriculum has to be designed and developed to meet the demands of tomorrow. Learning syllabi should aim to build lifelong learning skills and research on technology skills. However, the curriculum needs to develop and expand beyond its traditional norms. Besides the increasing demand for teachers, doctors, nurses, lawyers, accountants, and so on, schools' curricula need to help students "become the robotics engineering, cybersecurity experts, creative entrepreneurs, app designers, and esports coaches of the future (Casillas et al., 2019).

Overall, Singapore is taking a proactive approach to the challenges and opportunities presented by the rapidly changing world of work. By focusing on new teaching methods, STEM programs, advising on future jobs, and expanding the curriculum, the country is positioning itself to remain a leader in Southeast Asia and beyond.

In India

Every country around the world deals with its own issues in different ways, particularly in areas related to people's welfare, education, and workforce. The way in which the Indian government, business stakeholders, and educational agencies are addressing education and workforce challenges is quite interesting.

To begin with, it is important to understand the current situation in India with respect to education and workforce:

a. India has the world's largest population of young people between the ages of 15 and 25, yet only 5% of its workforce are formally skilled (according to a World Economic Forum report from October 2022).
b. Access to training opportunities is restricted by geographical and financial barriers.
c. There is a significant gap between the syllabus and the job market. India is the second largest producer of STEM graduates, with around 2.6 million graduates per year, but only 47% of them are deemed hireable.
d. Public funding for higher education has dropped significantly, and the government is struggling to educate and employ its growing population.
e. There is a significant increase in workers and students from India.

In addition, India has the city of Bangalore, which is known as the “city of technology” and “city of opportunities”. Bangalore is home to some of the most successful international technology companies, such as Microsoft, IBM, Infosys, and Wipro, as well as many other international businesses run by Indian professionals.

Bangalore is one of the fastest-growing cities in India, with a population predicted to reach 20.3 million by 2031. However, Bangalore is becoming overcrowded, and lacks sufficient infrastructure services: There is not enough fresh water, electricity is unreliable, and the internet is not strong enough.

To address these challenges and move towards a better future, the Indian government is working closely with educational bodies and business sectors to:

a. Increase public funding for education.
b. Revise the education curriculum from primary to graduate levels based on personalized learning to cater to each individual's skills and learning abilities.
c. Improve the school-to-work transition and prepare students for future jobs. Public and private sectors will be asked to support and provide opportunities for students to gain work experience and practical training through internships, apprenticeships, volunteering, etc., to enhance and build skills while still in school.
d. Develop advanced future skill programs driven by experiential learning, which requires investment in physical infrastructure, resources, and teacher capacity building.
e. Provide the necessary resources to schools and students in using new electronic devices and machines, such as artificial intelligence and machine learning for programming code evaluation and assessment, and natural language processing for coding in local languages. This will provide students with experiential learning skills and prepare them for the 21st century workforce.
f. Bridge wealth and cultural disparities to ensure education for all Indians. Technology can level the playing field and connect rural India with the rest of the world by offering relevant courses and platforms at reasonable costs or for free.
g. Develop online education along with traditional education to ensure that all students have access to a good education anywhere, anytime, and regardless of cultural or financial disparities. Online channels like MOOCs, Swayam, etc., have been revolutionary for Indian students (Swargiary, 2023).

Finally, assessments and examinations should not focus solely on grades, but on students' skills and knowledge, encouraging them to become lifelong and creative learners, and preparing them for the future workforce.

Future education for future jobs in the UAE

The United Arab Emirates (UAE) stands as a swiftly progressing nation within the Middle East, distinguished by its profuse natural resources, notably encompassing gas and oil reserves. These valuable assets have cemented the UAE's stature as a pivotal contributor to the global economy. Engaging in dynamic partnerships, the UAE diligently collaborates with the education ministry, industry consortiums, private sectors, and international entities, unified in their pursuit to forge an education ecosystem. This holistic endeavour aims to empower students not only within the UAE but also across the expanse of Arabic nations, enabling them to adeptly navigate the swiftly evolving technological terrain and aptly prepare for the forthcoming array of job prospects.

In the 21st century, the focal point of education has shifted towards nurturing original thought, creativity, and innovation. Departing from the rote memorization approach, there is a growing emphasis on cultivating children's imaginative prowess to tackle challenges, thereby instilling in them the invaluable skill of confident decision-making—a lifelong asset. Abu Dhabi keenly acknowledges the paramount importance of innovation and has seamlessly woven it into a tapestry of strategic policies. These policies are architected to forge an ecosystem that fosters innovation, cultivates a culture of measured risk-taking, and bolsters research and developmental capacities. Such aspirations are vividly articulated within the frameworks of Abu Dhabi Economic Vision 2030 and Vision 2021, which advocate for a knowledge-driven, innovation-centric trajectory of economic growth.

However, the effective implementation of a curriculum that adeptly imparts creative learning and problem-solving skills demands meticulous contemplation. Educational institutions must ensure that their teaching faculty possesses the requisite competencies, and the availability of essential resources holds pivotal importance. While the UAE is not solitary in grappling with this challenge, countries like Canada, Sweden, Finland, and numerous others have embarked on transformative reforms over the past three decades to champion educational parity, elevate quality, and amplify student performance, all in response to the exigencies of the global economy.

In light of this, the redesign of the curriculum assumes paramount significance, acting as a cornerstone for creating an environment where students feel empowered and at ease when delving

into novel learning experiences. This pursuit of creative learning, along with its attendant challenges, mirrors a shared narrative among nations, propelling them to prioritize and embark on educational overhauls.

Amidst the rapid surge of technological progress, the drive towards decarbonization and renewable advancements, and the flourishing of cutting-edge industries, the job market stands on the precipice of a profound metamorphosis, with projections estimating the emergence of approximately two billion novel employment opportunities. This presents an enormous quandary for educational institutions, as they grapple with the imperative to equip students for careers that have yet to materialize.

The impending onset of the fourth industrial revolution has kindled concerns among experts regarding potential scarcities in talent and gaps in skills. The existing workforce will encounter escalating demands to continuously enhance their skill sets and even undergo reskilling, resulting in a recalibration of learning and developmental frameworks. The mere acquisition of a degree has ceased to suffice, for there is an escalating emphasis on perpetual learning, a sentiment underscored by Professor Ammar Kaka, Vice-Principal at Heriot-Watt University Dubai. In this intricate milieu, it becomes imperative to delineate the knowledge and proficiencies that will be requisite for students to flourish within the forthcoming job landscape.

New Education Structure in the UAE

The UAE is taking significant strides in shaping the response to the imperative of preparing graduates for the future, accomplished through substantial educational reforms and the appointment of new Ministers. His Highness Sheikh Mohammed bin Rashid Al Maktoum, the Vice President and Ruler of Dubai, has recently introduced comprehensive structural adjustments aimed at elevating state schools and early childhood development.

Under this novel framework, the education system will function as a cohesive entity, encompassing diverse specialized realms, including the Education and Human Resources Council, Federal Authority for Quality of Education, Ministry of Education, Federal Authority for Early Childhood Education, and Emirates Schools Establishment. In its pursuit of transitioning towards a knowledge-based economy, the UAE has departed from conventional scientific and literary streams, adopting a two-track system comprising general education and advanced education. This transformation empowers high school graduates to directly matriculate into universities without the requirement of a foundational year.

The crucial nexus between the education system and industry requisites must be established for triumph. One effective strategy entails facilitating opportunities for practical work experience. A recent pivotal labour reform permits individuals aged 15 and above in the UAE to engage in part-time employment. While these roles may not be within specialized domains, they furnish exceptional environments for honing skills and cultivating a strong work ethic, positioning individuals for more lucrative employment prospects.

The globe will keenly observe the UAE's endeavors in reimagining a more resilient and future-focused education system, given its potential to serve as a model for other nations endeavoring to undertake educational reform.

Future Education for Future Jobs

Dr. Mohamed Ebrahim Al Mualla, the Undersecretary for Academic Affairs at the UAE Ministry of Education, underscored the paramount importance of education as a foundational cornerstone for embracing the future, attaining sustainable development, and transitioning toward a knowledge-based economy. Speaking at GESS Dubai 2021, he emphasized the opportunity to deliberate on contemporary and emerging educational issues and to build upon educational accomplishments in spite of the challenges posed by the Covid-19 pandemic.

Al Mualla delineated the primary focal points for the UAE's education sector over the next five decades. These encompass establishing a high-quality education system that nurtures competitiveness from early childhood, crafting an innovative global educational framework that enhances future-oriented skills, aligning higher education outcomes with the evolving demands of the labour market, and implementing a sophisticated and adaptable national qualifications system

to meet the requisites of future economic development. He also placed significant emphasis on establishing a sustainable support system for individuals of determination, commencing from early identification and extending to equipping them for future leadership roles. Moreover, fostering talent through a proactive holistic system that encourages productivity and competitiveness, along with promoting well-being and a sustainable quality of life within learning environments, are also pivotal objectives. Through this concerted focus on these domains, the UAE aspires to establish a comprehensive and forward-looking education system that underpins its visionary aspirations for the future.

CONCLUSION

This study highlights global concerns regarding the future economy and the impact of modern technology on the workforce across various industries. Human life is increasingly influenced by both natural and non-natural disasters, such as the COVID-19 pandemic. Therefore, policymakers and decision-makers must collaborate with stakeholders in business and economic sectors to safeguard and enhance the quality of life for future generations. A flexible and adaptive education system remains fundamental to human development. Future education must prioritize inclusiveness, connectivity, and creativity, ensuring continuous professional development for educators to keep pace with advancements in technology, economics, and education. High-quality, individualized instruction is essential to equip students with the skills and competencies needed to navigate the evolving job market.

Establishing and maintaining strong linkages between educational institutions and commercial industries is crucial. Transparent and efficient feedback mechanisms between these two entities will enable educational organizations to adapt their teaching methods to align with industry needs. However, the feasibility of achieving this remains a challenge. As a foundational principle, schools should emphasize teaching students how to learn, critically assess information, and apply knowledge to real-world problems. Educational programs must foster analytical thinking and problem-solving skills to ensure students are prepared for dynamic work environments. Ultimately, there is no universal solution to address all challenges in future education and employment. It is imperative that policymakers, educators, and industry leaders equip the younger generation with the necessary knowledge and resources to thrive in the workforce. By doing so, they will foster a generation of creative and productive individuals who contribute meaningfully to their societies and the global community.

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