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Redefining Successful Teaching and Learning in Australia's Education System

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Abstract: This paper proposes a redefinition of successful teaching and learning within Australia's evolving educational system, framed by the context of global economic, societal, and environmental changes. It highlights the interconnectedness of these shifts with the Australian education system and introduces six essential habits of practice that can effectively prepare learners to navigate and shape their futures. To ensure the success of education in Australia, it is critical not only to respond to current challenges but also to equip students with the ability to make contributions to society, the economy, and the environment. The paper emphasises the importance of embedding these six habits into educational practices, which are critical for fostering the necessary skills, knowledge, and values in students. Furthermore, it discusses how the economic, social, and environmental contexts of Australia will demand specific capabilities from individuals, which can be nurtured through targeted educational practices.

Keywords: future-readiness; innovation; habits; learning outcomes



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1. Introduction

Fundamental shifts in the economy, society, and the environment at the global, regional, and national levels are redefining how people work, live, and learn in Australia. For example, rapid technological advancements globally are reshaping business models, where organisations compete on intangible assets such as intellectual property, data, and user networks. Another shift relates to Australia's ageing population and low birth rate. This demographic change will lead to a shrink in the growth of the local workforce and place strain on the social fabric of Australia. On the environmental front, Australia needs to balance its urbanisation for resources and create sustainable practices to reduce its carbon footprint.

At a glance, these challenges may seem unrelated to schools. However, one of the missions of the Australian government's Department of Education is to "prepare children and young people for further study or work" see <https://www.education.gov.au/about-department/resources/2022-23-corporate-plan-department-education> (accessed on 20 April 2024).

The challenges that Australia faces have fundamental implications and questions for the readiness of Australia's education system to enable its learners actively to co-create the future of its environment, society, and economy, together with the government.

The traditional learning environment is insufficient to meet the future needs of Australia. The Australian government developed the quality teaching model to provide teachers with practical and theoretical tools for collaboratively reflecting on their pedagogical practices [1]. One of the dimensions of the model is significance, which emphasises making learning meaningful by connecting it to students' prior knowledge, identities, external

contexts, and diverse cultural perspectives. Additionally, the Australian Curriculum, Assessment and Reporting Authority has identified seven general capabilities essential to the Australian curriculum for equipping young Australians to live and work successfully: “literacy, numeracy, information and communication, critical and creative thinking, personal and social capability, ethical understanding and intercultural understanding” [2]. However, the advent of Industry 5.0 represents a technological revolution that will transform how people live, learn, and work. This revolution is driven by rapid changes in work and the economy, posing unprecedented challenges to the education system. Consequently, it is imperative for schools and educators to recognise the necessity of preparing learners for the era of artificial intelligence.

- How do we develop “future-ready” learners who co-create living, lifework, and learning in Australia?
- What skills, knowledge, and values are needed, beyond subject mastery, to enable learners to thrive in Australia’s future contexts?

Consider the following definition of the purposes of successful education and the concept of being future-ready: An education system can only be successful if it is able to develop future-ready individuals who will continue to learn beyond graduation, take on future lifework, and thrive in a changing society and environment.

In this definition, there is a clear reference to and connection to the purposes of education (dimension 1, Figure 1) with life-long learning in order to prepare learners for the future of lifework, society, and the environment. These connections stress the importance of the education system being tightly integrated and interconnected with the local contexts and larger systems. Figure 1 illustrates the connection between the various contexts and systems and the purposes of education, which has immediate implications for informing educational practices. In the next section, we explore the importance of systems and contexts in determining the future of education in Australia.

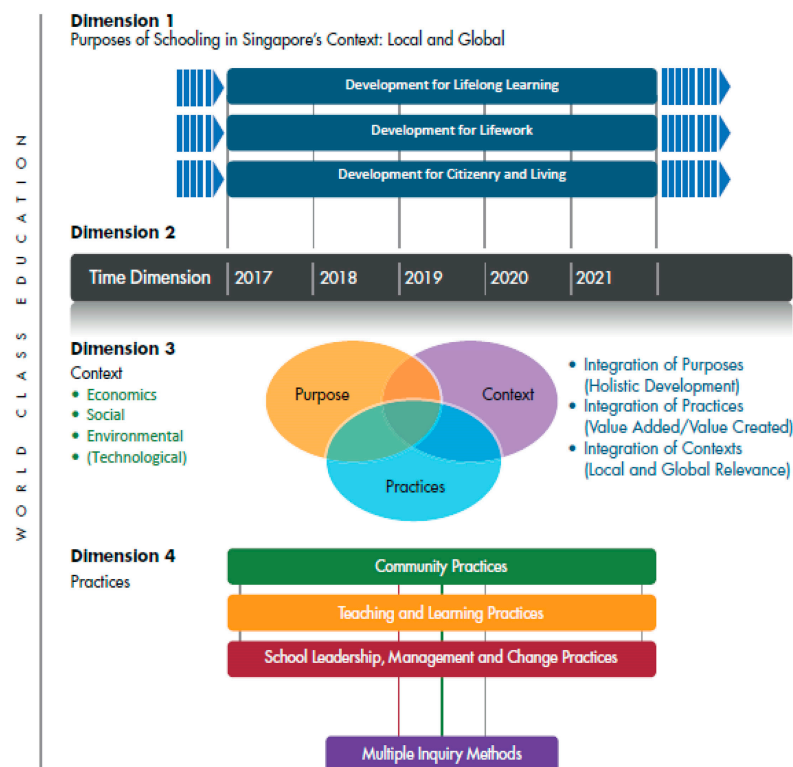


Figure 1. A multidimensional framework for educational success (copied with permission from Ng, 2019).

Preparing for the future in the context of Australia's economic, social, and environmental context is also critical for the vocational education and training (VET) sector. Also known as technical and vocational education and training (TVET) and skills training, VET in Australia plays a crucial role in equipping students with practical skills. Specifically, Australia's TAFE (technical and further education) colleges, the largest providers of VET, offer practical learning and technical preparation for hundreds of different jobs [3]. The primary goal is to ensure that graduates have the job skills required by employers, aligning with the redefined objectives of education [3].

This paper will provide a synthesis of a systematic review of Australia's future contexts and define the learning outcomes of future-ready learners in the system. A detailed analysis of the contexts will be provided, and learning outcomes will be gleaned from the analysis. Redefinitions of the education systems based on the synthesis of contexts will be discussed. Finally, the paper proposes a new and expanded learning outcome based on the development of habits of practice in order to prepare learners to be future-ready.

2. Contexts as Defined by Systems

Education and context share an intricate, mutually dependent relationship. Context shapes education, and education also shapes context. The outcome of education is to develop future-ready learners who co-shape and co-create the future contexts of the economy, society, and environment. In terms of the economy, education develops the human capital of the workforce and raises economic productivity [4,5]. Other important factors that contribute to the economy, such as politics and domestic and foreign investments, are also influenced by the education of policymakers and investment managers [4]. Education shapes society by instilling social, religious, and cultural values and norms to help individuals integrate into their communities. Through socialisation, education ensures that individuals are raised appropriately as members of their society [6]. Additionally, education can be used to guide individuals' attitudes and behaviours regarding environmental resources [7].

Moving on from how education shapes context, let us consider the ways in which context shapes education. In particular, how do the trajectories of future contexts shape education? Context provides the frame for the specifics and details that describe the purposes of education. As mentioned earlier, successful schools are those that fulfil the three purposes of education. School leadership plays a fundamental role in leading schools to achieve success. The practices and policies implemented by school leaders are essentially shaped by the context in which the school is situated. The interpretation of the context by school leaders directs the vision, practices and criteria that school leaders set for the success of schools.

Several scholars have emphasised the importance of examining school leadership in context [8–12]. Hallinger [10] describes six contexts in which school leadership is situated: the institutional, community, national cultural, economic, political and "school improvement" contexts (dimension 3, Figure 1).

1. The institutional context refers to the education system as a whole and its various parts on the regional level, state level and local level. The structure of the education system influences the role definition and behaviour of principals, such as their allocation and use of time (dimension 2, Figure 1) [13];
2. The community context, such as the socio-economic composition of the school and whether the school is located in urban or rural communities, also shapes how principals adapt their leadership;
3. National culture influences the socio-cultural norms and values that are upheld and practised by school leaders. For example, whether leadership is practised in a top-down manner or a less hierarchical manner reflects the socio-cultural standards of the society in which the school is situated;
4. The economic context greatly affects the resources and opportunities to which a school has access, which in turn influences the work of the school leaders;

5. The political context shapes the political ideology that directs the broad policies and practices of school leaders [14];
6. Last but not least, the context that Hallinger [10] referred to as the “school improvement” context is the school improvement trajectory. At different stages of a school’s improvement, school leaders will shift their focus and practices accordingly.

National policies are part of the macro context at the national level, while the “school improvement” context relates to the specific school. The recent Alice Springs (Mparntwe) Education Manifesto, modified by the Australian government in 2020, built on the success and impact of the 2008 Melbourne Declaration on Educational Goals for Young Australians [15]. It presents a vision for an outstanding education system and sets two key objectives to ensure that Australia’s education system remains capable of providing the best opportunities for young Australians in this changing society [15]. First, the Australian government aims to ensure the education system is of high quality and equitable. Second, it emphasises the need for Australian youth to be confident, innovative, life-long learners, and active members of their community.

Contexts overlap and are interdependent. Overlapping and ambiguous as they might be, it is important for school leaders to take contexts seriously to achieve success for their schools. In this paper, we selected economic, social, and environmental contexts to describe the purposes of education over time. These are macro contexts at the national level and relate to the three purposes of education identified above: learning, lifework, and well-being. Technological aspects are interwoven into all three primary contexts. Next, we examine the contexts in which Australia is situated and make comparisons with other high-income countries.

3. Methodology for the Systematic Review of Contexts

This paper adopted a systematic review of the economy, social, environmental, and education contexts in Australia. The systematic review approach adopts the following procedures:

3.1. Review Search of Databases

The data sources for this study were primarily obtained from reliable databases, including Google Scholar, A+ Education, EBSCOhost, research databases, ProQuest 500, theses, dissertations, speeches, government ministry reports, government plans, and newspapers.

The literature was searched using various keywords such as “Australia”, “economy”, “skills”, “environment”, “society”, “21st-century education”, “contexts”, “assessment”, “education”, “habits”, “systems”, and “school leadership” from 1991 to 2024.

3.2. Literature Screening Process

This process involved three crucial rounds to ensure the most relevant sources for the study were selected. In the first round, the search yielded 498 papers by reviewing all abstracts, headings and titles from 1991 to 2024. In a second round, all the papers and sources were thoroughly read to assess their relevance and quality. All information about the authors, date, relevant findings, discussion, and conclusions of each paper were extracted and collected in a spreadsheet. The research team was particularly careful when analysing information from non-academic papers, especially government papers and open-source statistics. We triangulated the data through the following process: speeches from government officials that triangulated policies and plans and alternate sources of statistics, such as the OECD, World Bank, etc., in order to ascertain the authenticity of the data. Relevant findings of the final 186 papers and sources directly related to the topic were then recorded in the summary table (Table 1).

Table 1. Classification of the reviewed papers.

Type of Papers (1991–2024)	Total
Journals	82
Government publications	51
Open-source statistics	28
Newspapers	25
Total	186

Specifically, they were then synthesised according to the major themes: Australia’s trajectories of economic, social, and environmental contexts, which were further divided into two sub-themes: Australia’s current educational initiatives and learning outcomes derived from the trajectories of contexts.

4. Interconnectedness of the Economic System with the Education System

Change is constant in the economic trajectory of a country. Change includes growth in the gross domestic product (GDP) and new economic directions that have direct implications on changes in capabilities, competencies, and knowledge. When plans are announced for new economic restructuring, it becomes imperative for political leaders and educators in the country to review the current desired educational outcomes, as well as the related efforts being made to develop the next generation of the local workforce.

Australia achieved a real GDP growth of 2.0% in 2016 [16]. Based on the industry’s total employment, people employed in small and medium-sized businesses contributed significantly to Australian employment (Figure 2). The bar chart shows that the large size of the small and medium-sized businesses indicates a critical role in the country’s employment landscape. Specifically, the construction industry is prominent across all industries in Australia (employing 80,100 people), the second is professional, scientific and technical services (employing 655,000 people), and the third is accommodation and food services (employing 461,000 people) [17].

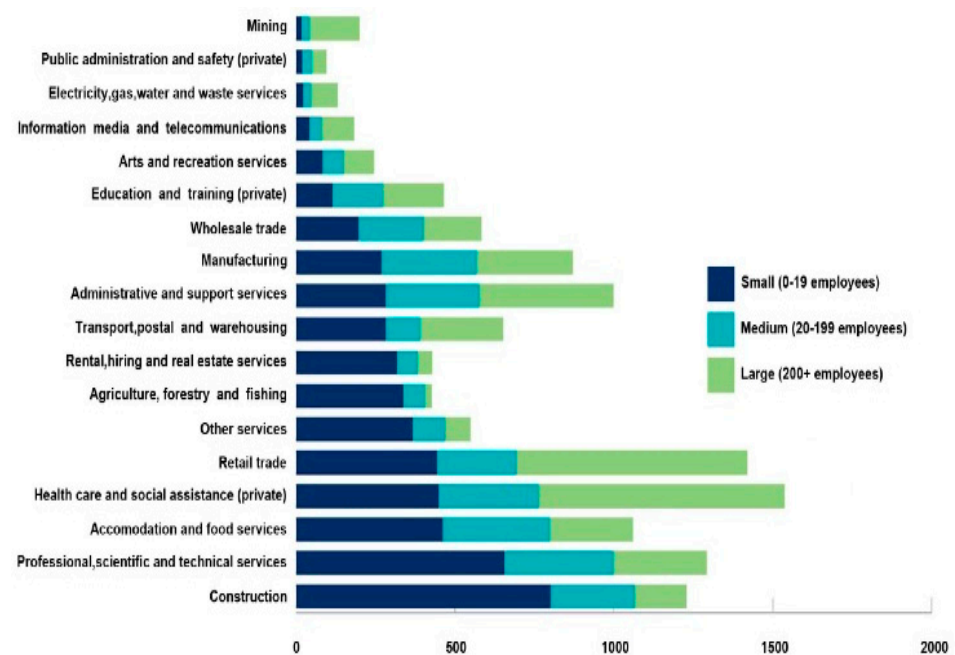


Figure 2. Employment share by sectors. Source: ABS Australian Industry, May 2023 and ASBFEO calculations, private sector industry.

The pie chart (Figure 3) illustrates the distribution of Australia's GDP across different industry sectors for the year 2016. The GDP for this period was \$1657 billion, and the sectors are categorised into primary, secondary, tertiary, quaternary, and quinary industries. Australia's mixed economic structure in the service industry is broadly similar to that of other developed economies. As the largest contributor to Australia's GDP, it includes finance and insurance services, healthcare, education, and so on, which account for almost 80% of the quinary sector, quaternary sector and tertiary sector in that year (Figure 3). In contrast, the manufacturing industry represents a smaller portion of the economy, contributing 5.9% of the GDP.

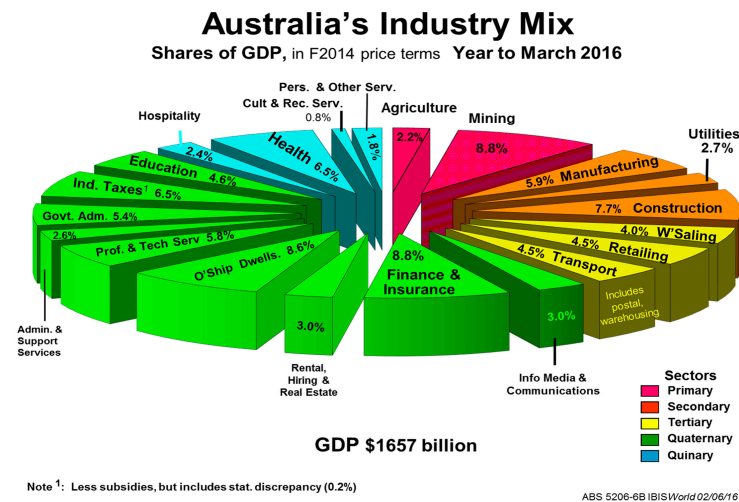


Figure 3. Australia's industry mix. Source: <https://www.firstlinks.com.au/australias-future-growth-h-coming> (accessed on 10 March 2024).

Historically, the service industry in Australia has seen substantial growth, expanding from around 50% of the total output in the 1960s to approximately 80% by 1995 (Figure 4). This trend continued into the 21st century, with growth observed in the sector over the past two decades. Notably, the top three contributors to the service industry in 2016 were the finance and insurance services (8.8%) and ownership of dwellings (6.5%), as reported by the Australian Bureau of Statistics [18].

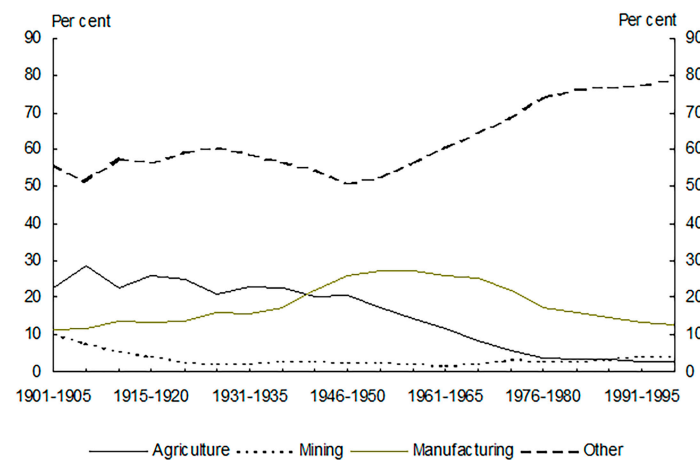


Figure 4. Percent of GDP according to different sectors. Source: <https://treasury.gov.au/publication/economic-roundup-centenary-edition-2001> (Accessed on 14 May 2001).

This shift reflects a broader transformation in Australia's economic structure, where the service industry's rapid expansion, especially in the business, financial, and professional

services (Figure 5), along with social services, such as health and education, marked the transition into the 21st century. Meanwhile, manufacturing, agriculture, and mining have seen a relative decline in their contributions to the economy.

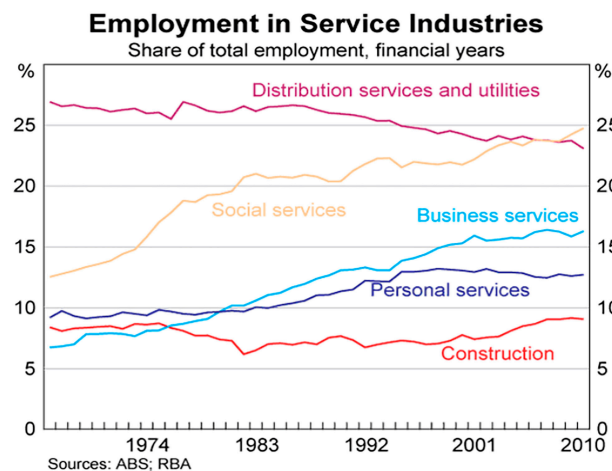


Figure 5. Types of services in Australia. Sources: ABS; RBA.

4.1. Emphasis on the Adoption of New Technologies and Innovation

In recent years, two of the themes that have been reiterated in the economic transformation are the adoption of new technologies and the need for innovation [19,20]. In the following sections, we shall discuss the two themes more deeply, with some specific examples.

The need for industries, enterprises, and workers to adopt new technologies is in tandem with the emergence of Industry 5.0. Across the globe, new technologies are reshaping the economies of nations, business models of enterprises, and individuals' jobs. For example, the global trajectory towards high value for manufacturing requires that manufacturing companies move up the value chain [21]. This can be assisted through deploying suitable new technologies such as automation and robotics. High-value manufacturing is important to Australia, as manufacturing is a significant contributor to the nation's economy. When we speak of high-value manufacturing, we consider the financial, strategic, and social aspects of value.

The government is bolstering innovation in some key sectors by encouraging business innovation, fostering collaborations between private and public sector researchers, and enhancing the research capabilities of universities and public research organisations. During the year 2010, the Australian government allocated 8.6 billion towards creativity, science, and innovation. This is a 25% increase from the previous year, 2008 [22]. This large amount of funding aims at supporting Australian innovation and is further enhanced by investments in essential infrastructure such as the national broadband network. Furthermore, this fund is used for comprehensive educational reforms, which include the entire stages of learning, from early childhood education to post-doctoral studies [23].

4.2. Knowledge, Skills, and Values Needed to Meet the Future Challenges of the Economy

As technology changes, it impacts the way we work on jobs. With the integration of new technologies within businesses, companies require employees to be equipped with a variety of new skills. This situation can affect workers who may find it challenging to keep pace with rapid changes in the workplace, potentially feeling marginalised. The success of enterprises is closely linked to the competencies of their workforce. Therefore, developing the skills of the workforce with ongoing technological transformations in companies is crucial.

In this context, the Australian government has noted that a range of emerging skills are increasingly demanded across different job market sectors. These emerging skills are

identified as new requirements in job roles within the last five years. For instance, a decade ago, roles such as childcare centre managers or hotel managers would not have required social media competencies. However, the rise of social media has led to a growing demand for these skills in such positions. Specifically, job advertisements seeking childcare centre managers with social media skills grew from less than 1% in 2015 to nearly 15% in 2020 [24].

The report further highlights that digital skills, including automation, artificial intelligence, data analysis and cyber security, are among the fastest-growing competencies required in the job market. Acquiring knowledge, values, and skills (Table 2) that prepare individuals for the future workplace is becoming increasingly crucial. In response, the Australian government has established the Future Skills Organisation (FSO), a council aimed at addressing current labour and skills shortages and future-proofing the country's vocational education and training (VET) sector. The FSO focuses on advancing future skills for successful businesses of all sizes and industries [25]. They offer clear guidance, opportunities, and training for everyone to develop skills relevant to the future [25].

Table 2. Summary of Australia's economic trajectory and future knowledge, skills, and values required.

Economic Trajectory	Knowledge, Skills, and Values Required
<ul style="list-style-type: none"> • A significant exporter of natural resources, energy (natural gas and coal), and food • Exports primarily to East and South Asian regions. The slowdown in China has affected the Australian economy • Expanding high-value manufacturing exports. However, low-value manufacturing remains • A growing service sector of education, tourism, and finance • Diversity and disparity of employment ranges from high pay, high-skill, full-time employment to low pay part-time employment • Gap in economic growth between cities and regional Australia 	<ul style="list-style-type: none"> • Learn, unlearn, relearn • Questioning • Reflection • Passion (joy of learning) • Inquisitive mind • Acceptance of failure as part of learning • Experimenting

4.3. Redefinition of Successful Education: Developing Learners for Future Lifework

The global economic landscape is becoming more competitive, and it is imperative for Australia to create new value in the products and services that it delivers. Australia cannot sustain a competitive edge simply by producing what the rest of the world is producing [26]. This calls for innovation in the jobs of the future. Furthermore, Australia's economic trajectory requires workers who are able to learn and apply technology quickly to keep up with the speed of change in the age of Industry 5.0 [27]. Paper qualifications are no longer sufficient for employers. Increasingly, employers are looking for workers who can quickly adapt and provide creative solutions to problems. Life-long learning becomes the norm. Those who cannot catch up will face great challenges in the future economic landscape of high-value manufacturing and high-value service jobs.

An education system can only be successful if it is able to develop future value in individuals to prepare them to take on and thrive in jobs in the future (the second purpose of education with a future perspective). For example, education must make innovation an ingrained mindset in students to prepare them for future jobs. Developing an innovative mindset will require consistent teaching and learning environments that will foster such a mindset. Rote learning and efficient learning will no longer be enough in the new economic reality [28].

In the next decade, and relevant to Australia's context, value creation will be instrumental in creating new jobs, products, and services, as well as changing the way we live, learn, and work. Value creation is derived from the actions of people working on a current

entity and utilises deep mastery, innovation, and creativity to create new uses for the existing entity [29–31]. Value creation will require educators to take a long-term view of learning. Learning for the immediate often focuses on facts and meeting standards. The long-term view of learning in value creation will require cultivating a passion for learning, having an inquisitive mind, and accepting failure as part of learning and experimenting (prototyping). The fear of failure is directly associated with the motivation of avoidance [32]. In creating value, learners will have to overcome this fear of failure. These must be part of the repertoire of habits and practices to be ready for value creation and the future of lifework.

5. Interconnectedness of the Society System with the Education System

Australia is experiencing significant shifts in its demographic profile, characterised by an ageing and expanding population. This shift will profoundly reshape Australian society, particularly affecting the health and aged care sectors. There are also challenges posed to Australia, such as multicultural issues and the health of Australians. Australian society is structured around people who have different cultural, linguistic, and religious backgrounds. Increasing cultural diversity also causes challenges for Australia in terms of ensuring equitable access to social support such as education. In terms of health, obesity is also a significant health issue due to rising rates of obesity in both adults and children. As individuals age, the incidence of sickness and disability notably increases, requiring greater resources and support from health and aged care systems.

5.1. Ageing Demographic Transition

A notable trend in Australia's demographics is the increasing proportion of people over 60 years of age, along with an increase in the number of retirees and people with chronic illnesses, which presents a major challenge for the government [23]. This demographic change can be attributed to the "baby boom" of the 1950s and 1960s, coupled with a decline in birth rates over subsequent decades [33,34]. Baby boomers have experienced a period of elevated fertility rates after World War II, and they will turn 65 years old between 2011 and 2031 [35,36].

By 2026, projections indicate that more than 22 per cent of Australians will be over the age of 65, a significant increase from 16 per cent in 2020, which represents a doubling from 8.3 per cent at the start of the 1970s [35,37]. Between 1982 and 2023, the median age increased by 8.3 years to 38.5 years [38]. By 2044, nearly a quarter of the population is expected to be aged 65 and over, a total of approximately 7 million Australians [35,39,40]. This demographic shift, while presenting challenges, has also had positive development: Australians are now living, on average, 30 years longer than a century ago.

However, seeing the population ageing only in terms of the increase in the number of older people is not enough. The capability to meet the needs of elderly people grows on having an adequate number of younger individuals to sustain the economy and deliver necessary services [38,41]. Unlike the temporary demographic increase caused by the baby boom, Australia has been experiencing a long-term decline in fertility rates since the 1960s. Specifically, there was a slight increase in fertility rates from 1.59 births per woman in 2020, the lowest ever recorded, to 1.7 births per woman in 2021 [42].

Although the baby boom period temporarily delayed the ageing of Australia's population, it only later exacerbated its impact. The real main factors driving population ageing are the persistent decline in fertility rates and improvements in longevity.

5.2. Cultural Diversity

Australia is a multicultural nation with the world's oldest continuous cultures. There are almost 7 million people who have migrated to Australia. People who were born in the United Kingdom constitute the largest group of overseas-born residents in Australia, achieving 5.3% of the whole population [43,44]. The second largest is those from New Zealand, approximately 2.6%, followed by China (1.8%), India (1.6%), and Vietnam (0.9%) [45]. In

the 2013–2014 period, Australia approved citizenship for 163,017 individuals from more than 190 countries [46].

Therefore, the education system needs to be internationalised to meet the country's increasingly diverse population. Australia's immigration and education policies have been closely linked since the 1970s [47]. It encourages a global perspective and multiculturalism in the early years to prepare students for the future.

Arasaratnam [48] examined the role of multiculturalism in Australia from the perspective of educators. He found that higher education can play a role in influencing people's understanding of cultural diversity and noted that the values of multiculturalism should be integrated into the curriculum [48]. Education can provide the right tools for thinking, and actively engaging learners with cultural diversity can foster and increase inclusivity and cognitive complexity [48,49]. Australians also hope that their country will become more inclusive, respectful, and committed to multiculturalism within a decade [48,50,51].

Cultural diversity would require deliberate intervention in terms of policies and practices. For example, intercultural acumen is an important outcome of learning for future-ready learners. Therefore, intercultural acumen is proposed as one of the six habits of practice for future-ready learners.

6. Interconnectedness of the Environmental System with the Education System

The environment provides Australians with direct and indirect benefits to their well-being. A direct contribution is that the environment sustains life, provides health benefits and generates considerable enjoyment. Due to this feature, it is hard to estimate the value of the environment's direct contribution, creating the risk that it will suffer damage. The indirect contribution of the Australian environment is its input to production. Australia's natural resources are a substantial component of Australia's total commercial assets. Climate change and energy consumption are threats to Australia's environment. There will be terrible consequences if this threat is not addressed for Australia's distinctive biodiversity, infrastructure, agriculture, tourism, and water supplies in cities and rural areas.

Climate Change

Australia, as one of the driest continents on the planet, is also among the most affected. Specifically, the continent covers tropical, temperate, and dry climates, all of which are highly variable [23,52]. For example, national parks will be threatened, almost all irrigation agriculture in the basins could stop, and urban water costs could rise significantly [53]. According to the Ghana Climate Change Review, Australia's GDP will fall below 8% by 2100 if the government does not take action to slow down climate change, and this will have a significant negative impact on real wages and consumption [54].

Australia's emissions are more than triple those of the entire Pacific region, including New Zealand. Energy consumption, such as electricity generation, transport, and the manufacturing sectors, has contributed to the largest part of Australia's emissions to climate change [52]. Coupled with the effects of global warming. Australia's climate has been continuously warming since 1910, with an average air temperature rise of 1.44 ± 0.24 °C [55]. Moreover, most of this warming has occurred since 1950, and every decade thereafter has been higher than the average of the previous decades [56].

Rainfall is significantly less in the summer, especially in southern Australia, where the southwest and southeast have seen below-average values in 17 of the last 20 years [57]. This reduction in rainfall contributes to lower humidity and higher temperatures, increasing the danger of bushfires. One report showed that the number and length of periods of dangerous fire weather have increased since the 1950s [55]. Furthermore, the risk of fire has also increased due to the number of lightning storms. In terms of coastal areas, Australia, as an island, is particularly vulnerable to global sea-level rise. Notably, sea levels in northern and south-eastern Australia have risen faster than the world average, bringing new environmental challenges for Australia [55].

7. Knowledge, Skills, and Values Needed to Meet the Future Challenges of the Environment and Society

Australia's climate is experiencing extreme weather events and unprecedented climatic extremes. In recent years, Australia has experienced severe bushfires, droughts, floods, and storms. Observations indicate a trend of rising temperatures, altering rainfall patterns, a higher frequency of extreme fire weather days, increasing sea levels, higher sea temperatures, and increasing ocean acidification [57]. These extreme weather occurrences are increasing due to the impact of climate change, and it is anticipated that this trend will continue for numerous decades. According to the latest assessment by the IPCC [58], Australia will experience a rise in average temperatures of 1.5 °C in the 2030s. Such an increase in global warming is expected to lead to further changes (Table 3), which Australia has not experienced before. For example, despite the reduction in emissions, Australia still maintains a high level of carbon emissions per capita. This reflects the country's continued dependence on fossil fuels and highlights the challenges it faces in transitioning towards a more sustainable energy future.

Table 3. Summary of Australia's environmental trajectory and future knowledge, skills, and values required.

Environmental Trajectory	Knowledge, Skills, and Values Required
<ul style="list-style-type: none"> • Driest inhabited continent, making it particularly vulnerable to the challenges of climate change. • Floods, droughts, and bushfires. • Australia has become hotter and drier. • Annual temperatures since the beginning of the 20th century have risen by one degree, and rainfall has become heavier and more infrequent. • The carbon tax introduced in 2011 has reduced Australia's carbon emission by 11%. • More tropical cyclones. • High levels of carbon emissions per capita 	<ul style="list-style-type: none"> • Tolerance • Mutual understanding • Mutual respect • Logical reasoning • Rootedness • Information • Assessment literacy

Moving forward, people who live in Australia need to find creative ways to reduce greenhouse gas emissions and address the increasing need for energy to minimise the impact on the environment. The issues of energy use and global warming are crucially dependent on the ability of Australians to develop innovative and practical solutions to address the country's current and future challenges. To achieve this, education must play an important role in fostering creative thinking and instilling habits of innovation in students from an early age.

8. Redefinition of Education's Purpose: Developing Learners for the Future Society

Australia's future development is intricately linked to environmental factors. The greater consumption of energy and matter will inevitably follow as the country continues to develop as a modern and sophisticated country. How Australia will meet the increasing needs for energy and matter while achieving its environmental pledge is a challenge for the government and its people. There is an urgent and compelling need for Australia to include environmental education, implement concrete actions, and apply great ingenuity to come up with novel and innovative solutions for environmental issues. Without a sustainable and liveable environment, there will be no place to support future economic development or to live harmoniously.

The environmental context of Australia puts a spotlight on the need to derive novel and innovative solutions. Innovation and ingenuity are needed for Australia to solve its environmental problems. With economic growth and an increasing population, Australia has to find novel ways to address its increasing need for energy while minimising the

impact on the environment. The supply of Australia's energy must be sufficient, reliable, and renewable. Thus, the people of Australia need to come up with creative yet feasible ways to address challenges in these areas now and in the future. Education must foster this ability by inculcating habits for innovation in individuals while they are still in school.

Innovation is one of the key enablers for enhancing the capabilities to deal with environmental challenges. Developing competencies and habits for innovation is imperative in the new environmental landscape. Innovation is enabled by technology but is not limited to that. It is about coming up with new solutions and ways of doing things that create value in the environment.

9. Redefining Education: The Integration of Systems and Contexts for Developing Future-Ready Learners

As new realities emerge from the systems and contexts in Australia, there is a need to re-examine learning outcomes beyond assessment and standards. Practices such as those pertaining to teaching and learning must also evolve with new demands and challenges. Assumptions, beliefs, and theories that underlie these practices must not and cannot remain unchallenged paradigms when we talk about developing future-ready learners in Australia and elsewhere. As Puncreobutr [59] put it, the next generation of education practices "Education 4.0" must address the demands of society in an era of innovation. The management of learning must respond to societal and economic environments to address the need for human capital.

We have outlined the purposes of education whilst recognising that context and time are essential for the success of education. For the future of Australia, learners need to have an innovative mindset that enables them to rise to the challenges of the new economic and environmental realities. The starting point for innovation is generating and developing ideas. The next step would be to test the ideas and bring them to fruition. If the outcome is to develop a useful product, the final stage of entrepreneurship involves convincing others to use the new product. Translating these phases into teaching and learning practices in schools will necessitate a shift in educational practices [60]. This is because current practices focus on knowledge acquisition, and there is little room for students to generate and test out ideas that are not in the curriculum. Paradigms of teaching and learning such as constructivism, connectivism, student agency, and engagement in "communities of practice" might be more aligned with changing contexts. Figure 6 provides an infographic view of the skills, knowledge, values, and habits of practices needed for Australia's future-ready learners. The next section will explore the importance of developing habits of practice as the fundamental building blocks for the identified skills, knowledge, and values.

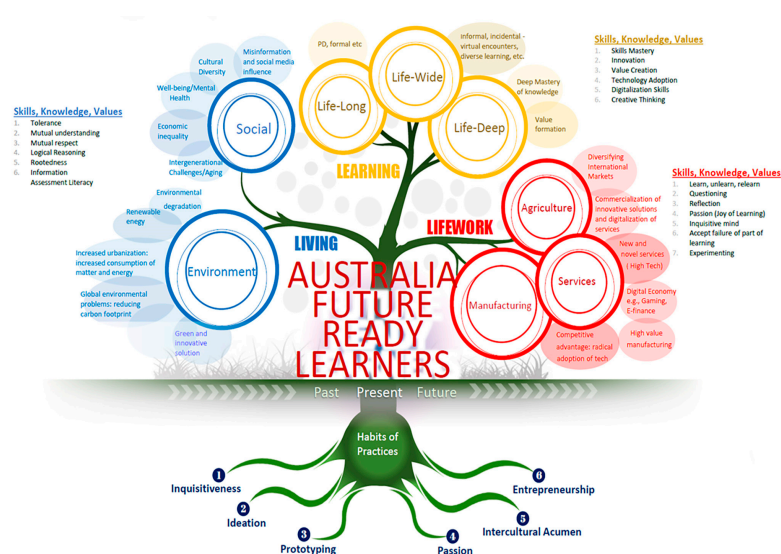


Figure 6. Trajectories of Australia's interconnected systems [61].

10. Habits of Practice

We identified six habits of practice that are required of learners to prepare them to meet the challenges of the future of Australia (Figure 6).

Figure 6 is an infographic representation of the trajectories of the economy, society, environment, and education contexts, as discussed in the earlier sections of the paper. It also provides a discussion of the six habits of practice.

10.1. Inquisitiveness

Inquisitiveness is a key habit that future students must cultivate. Inquisitiveness has been defined as a desire to embrace novelty, the acquisition of correct answers, and willingness to seek knowledge through questioning [62–64]. An inquisitive student must ask questions [64], be motivated to engage in asking thoughtful and sincere questions [65] and have a strong desire to learn more [62]. Some scholars agree that questioning is closely linked with students' search behaviours, where questioning is continuously identified as an important skill [62,66].

Curiosity, another component of inquisitiveness, involves the characteristics of questioning and exploring [61]. When attention becomes focused on students' knowledge gaps, these gaps "produce the feeling of deprivation labelled curiosity" [67]. Scholars variously viewed curiosity as an intellectual virtue [68,69] or as an emotion [70]. Its significance is underscored by the fact that it is often studied as a form of desire [71]. Litman and Spielberg [72] described curiosity "as a desire for acquiring new knowledge and new sensory experience that motivates exploratory behaviour". Likewise, Clark maintained that curiosity reflects a desire for knowledge, manifesting in students' search behaviours such as questioning and exploration.

10.2. Ideation

An idea is the product of creative thinking and is original and divergent [73]. In other words, ideas are the results of creative thoughts and innovation. Gonçalves and Cash [74] defined that ideas can be viewed as "interconnected nodes within a network", continually co-evolving with the representation of the problem. All individuals have the capacity to generate ideas in their daily lives [73], however, innovative ideas are even more significant and more closely linked to the future. This importance stems from the fact that organisations either compete or collaborate to come up with the most effective ideas for addressing the challenges [61].

The concept of ideation was first introduced by Guilford [75] who employed it to describe the patterns of interactions that occur when an individual generates an idea [76]. In early ideation research, ideation has been identified as a key step in organisation planning [77], decision-making [60] and problem-solving [78]. Reinig and Briggs [79] further refined the definition of ideation, describing it as "the process of generating or conceiving of ideas" that will be beneficial for achieving some outcomes or desired state. The Oxford dictionary defines ideation as 'the formation of ideas or mental images of things that do not present to the senses' [76]. Ng, Wong and Liu [61] described ideation as a component within the broader framework known as the creative problem-solving framework. The creative problem-solving framework advocates for a cooperative and iterative approach for students to think that uses their entire brain in the most effective sequence [80]. There are five components in this CPS process: problem identification, idea generation, idea synthesis, idea evaluation, and solution implementation [80]. Thus, ideation is represented by an individual's mindset for generating lots of ideas with a creative thinking warm-up and aiding in addressing a challenge [61,80].

10.3. Prototyping

A prototype is "an approximation of a product (or system) or its components in some form for a definite purpose in its implementation" [81]. Prototypes can be virtual (e.g., a computer-aided design model) or physical; they can be physically scaled and/or

functionally scaled, and they can use materials that are similar to or different from the final design [81]. Prototyping is the process of actualising the prototype.

Prototypes play several roles in the product development process [82]. Prototypes can aid the thinking and experimental phase, where questions and doubts about the product are addressed by building and studying the prototypes. In addition, practitioners can test and prove ideas and check if they work as intended (i.e., for evaluation and validation). Prototypes also serve to communicate information and demonstrate ideas to the intended audience. Further, companies also use prototypes to help schedule the development of a product. Therefore, prototyping is an important part of the product development process of companies, which enables ideas to be translated into action. In addition to having an impact on the business aspects of product development, prototyping also has psychological effects on the design team. In a grounded theory study of how “low-fidelity” prototyping impacts the psychological experience of a design team in a high-tech company, it has been found that “the production and rapid visualisation of multiple ideas through low-fidelity prototyping allows practitioners to reframe failure as an opportunity for learning, supports a sense of forward progress, and strengthens beliefs about creativity ability” [83]. Therefore, prototyping is intricately linked to innovation, creative thinking, and value creation. Developing the habit of prototyping in learners while they are still in school is necessary to prepare them for Australia’s future landscape.

10.4. Entrepreneurship

Perhaps nothing captures the idea of entrepreneurship more than the original French root word for “entrepreneur”, which roughly translates to an adventurer [84]. Having little to no natural resources, Australia’s economic growth is dependent on innovative macroeconomic approaches. Yet, much of the entrepreneurship in the past was in the form of low-tech SMEs (small-medium enterprises). Even though SMEs still account for one-third of Australia’s GDP and employ 57% of the country’s workers [85], those that were founded in the past are now faced with difficulties in the modern day. They have not adopted contemporary technology and lack modern entrepreneurial thinking. In fact, the twenty-first century should foster an innovative mindset fitting its time. Australia has remade itself as a centre for entrepreneurship, with an increasing number of innovative firms.

The new entrepreneurship is motivated not out of necessity [86]. Over the years, various articles have explored entrepreneurial cognition [86,87]. According to these studies, entrepreneurs should have highly developed behavioural scripts relating to opportunity seeking, commitment tolerance, and opportunity pursuit [88]. Through these skills, entrepreneurs are able to piece together previously unconnected information, which would enable them to create new products or services [88]. As such, the new entrepreneurship model should be one that is motivated to solve problems of the day through new products and services. This is essentially a future value proposition. By predicting the demands for solutions to today’s problems and by increasing the value of the current dominant products, an entrepreneur would be able to create the next revolution in the market, thereby creating lasting change [88].

10.5. Intercultural Acumen

Fairness, openness, cooperativeness, supportiveness and empowerment are five factors that promote inclusivity [89]. Nishii [90] showed that in an inclusive society, the perceived fairness of treatment is extremely important. Preferential treatments to improve historically disadvantaged groups have caused resentment or backlash from communities who were not on the receiving end of such treatment [91]. Australia has implemented policies of multicultural attitude and equality in order to avoid the issues documented in preferential treatment [92]. These policies have provided society with a foundation for collaboration among cultures and provided all its residents with a variety of opportunities, regardless of their demographic background.

Intercultural communication requires one to invest effort in making sure that one goes beyond the stereotypical image of “the other” and knows the person as an individual. This would require more than just sharing the same language, as language only forms part of communication. As mentioned in the preceding section, other factors, such as cultural contexts, influence communication greatly [93]. Communication is, after all, the gateway to understanding one another. The need for good intercultural communication is, thus, necessary for inclusivity and multiculturalism. While the traits mentioned in the previous paragraphs are more shaped by policies and environments, which are macro factors, they are more personal micro traits. As such, the capacity and ability for intercultural communication, such as the capacity to understand cultural differences and the capacity to assume perspectives belonging to other cultures, would be crucial in an inclusive, multicultural Australia.

10.6. *Passion*

Passion is defined as an individual’s preference for the activities they enjoy, which leads them to invest time and energy [94]. Furthermore, passion represents a persistent state of inner fulfilment arising from positive and active activities, which can also foster self-efficacy [94,95]. The dualistic model of passion (DMP) categorises passion into two types based on the nature of activity internalisation within an individual’s identity: harmonious passion (HP) and obsessive passion (OP) [96,97]. HP refers to an autonomously internalised identity and a robust desire to participate in favoured activities [97]. This type of internalisation originates authentically from an integrating self without external conditions such as self-esteem [98]. In contrast, OP arises from a controlled internalisation of an activity into the individual’s identity. This internalisation is influenced by interpersonal pressures and manifests as an uncontrollable urge towards passion [96]

Passion is the stimulus that allows people to engage in deliberate practice continuously and relentlessly, enabling them to improve their skills in the specific domain and eventually achieve mastery [99]. Moreover, passion plays an important role in life-long, life-wide, and life-deep learning, another of the future values we identified. Passion for learning is the fuel that enables one to keep learning throughout life in spite of all the roadblocks and difficulties encountered over an entire lifetime. Passion enables the learner to accept failure as part of learning. Without a passion for learning, a person will succumb to difficulties and failures and eventually surrender.

11. Conclusions

Successful education fulfils three purposes: the development of future learners for lifework, society, and the environment. An education system can be successful only if it is able to develop learners for the future: individuals who will work, continue to learn beyond graduation and thrive in a changing society and environment. Macro contexts, such as the economic, social, and environmental contexts of a nation, largely determine the strategic direction of education. Accordingly, schools need to adopt visions, missions and practices that are aligned with the economic, social and environmental trajectories of the nation.

The preparation of individuals for the three purposes of education—learning, lifework, and living—has to be viewed through a future lens, and learning outcomes need to be aligned with the trajectories and dynamics of the future of Australia. The future is context-situated and context-dependent, and in this paper, we have provided a discussion on how the future economic, social and environmental contexts of Australia require some specific future skills, knowledge, and values of individuals, which can be developed and expressed through particular habits of practices.

We introduced the habits of practice as the identified learning outcomes that future-ready learners must have. There are fundamental differences between competencies and habits. While the former refers to knowledge and skills, the latter refers to carrying out behaviours repeatedly in response to various situations. Both competencies and habits are

crucial for learning to ensure that practices are both supported by competencies (knowledge and skills) and by the readiness to practice or execute certain behaviours without being told. The latter also refers to “habits of practice”. What habits and practices must Australians have to co-create and shape the future of Australia? Schools should provide the context for developing habits and practices that are important for preparing students for the future of Australia. In other words, the formation of habits of practice can be achieved through everyday practices, teaching, and learning.

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References

- James, L.; Jennifer, G. Quality Teaching Model. Available online: <https://education.nsw.gov.au/teaching-and-learning/professional-learning/quality-teaching-rounds> (accessed on 29 April 2024).
- The Australian Curriculum (Version 8.4). 2022. Available online: <https://www.australiancurriculum.edu.au/f-10-curriculum/> (accessed on 26 October 2018).
- What Is Vocational Education and Training (VET)? Available online: <https://studyadelaidelife.com/whats-happening/what-is-vocational-education-and-training-vet> (accessed on 13 March 2024).
- Ozturk, I. The role of education in economic development: A theoretical perspective. *J. Rural. Dev. Adm.* **2008**, *33*, 39–47. [\[CrossRef\]](#)
- Sahlgren, G.H. *Incentive to Invest: How Education Affects Economic Growth*; Adam Smith Institute: London, UK, 2014.
- Francois, E.J. *Building Global Education with a Local Perspective: An Introduction to Global Higher Education*; Springer: Palgrave Macmillan, NY, USA, 2015.
- Fu, H.; Liu, X. A study on the impact of environmental education on individuals’ behaviors concerning recycled water reuse. *Eurasia J. Math. Sci. Technol. Educ.* **2017**, *13*, 6715–6724. [\[CrossRef\]](#) [\[PubMed\]](#)
- Braun, A.; Ball, S.J.; Maguire, M.; Hoskins, K. Taking context seriously: Towards explaining policy enactments in the secondary school. *Discourse Stud. Cult. Politics Educ.* **2011**, *32*, 585–596. [\[CrossRef\]](#)
- Clarke, S.; O’donoghue, T. Educational leadership and context: A rendering of an inseparable relationship. *Br. J. Educ. Stud.* **2017**, *65*, 167–182. [\[CrossRef\]](#)
- Hallinger, P. Bringing context out of the shadows of leadership. *Educ. Manag. Adm. Leadersh.* **2018**, *46*, 5–24. [\[CrossRef\]](#)
- Moos, L.; Krejsler, J.; Kofod, K.K. Successful principals: Telling or selling? On the importance of context for school leadership. *Int. J. Leadersh. Educ.* **2008**, *11*, 341–352. [\[CrossRef\]](#)
- O’Donoghue, T.; Clarke, S. The crucial matter of school leaders taking cognizance of educational contexts. In *School Leadership in Diverse Contexts*; O’Donoghue, T.A.C., Simon, Eds.; Routledge: London, UK, 2015; pp. 7–21.
- Lee, M.; Hallinger, P. National contexts influencing principals’ time use and allocation: Economic development, societal culture, and educational system. *Sch. Eff. Sch. Improv.* **2012**, *23*, 461–482. [\[CrossRef\]](#)
- Bell, L.; Stevenson, H. Towards an analysis of the policies that shape public education: Setting the context for school leadership. *Manag. Educ.* **2015**, *29*, 146–150. [\[CrossRef\]](#)
- The Alice Springs (Mparntwe) Education Declaration. Available online: <https://www.education.gov.au/alice-springs-mparntwe-e-education-declaration/resources/alice-springs-mparntwe-education-declaration> (accessed on 18 February 2020).
- Australian System of National Accounts, 2016–17. Available online: <https://www.abs.gov.au/ausstats/abs@.nsf/Previousproducts/5204.0Main%20Features2016-17?opendocument&tabname=Summary&prodno=5204.0&issue=2016-17&num=&view=> (accessed on 27 October 2017).
- Contribution to Australian Employment. Available online: <https://www.asbfeo.gov.au/small-business-data-portal/contribution-australian-employment> (accessed on 30 June 2023).

18. Australian System of National Accounts. Annual Estimates of Key Economic Measures, Including GDP, Consumption, Investment, Income, Capital Stock, Productivity and Balance Sheets. 2019. Available online: <https://www.abs.gov.au/statistics/economy/national-accounts/australian-system-national-accounts/2018-19> (accessed on 27 October 2023).
19. Mihalache, O.R.; Volberda, H.W. Business model innovation in transforming economies: A co-evolutionary perspective for a global and digital world. *Manag. Organ. Rev.* **2021**, *17*, 202–225. [CrossRef]
20. Chui, M.; Evers, M.; Manyika, J.; Zheng, A.; Nisbet, T. The bio revolution: Innovations transforming economies, societies, and our lives. In *Augmented Education in the Global Age*; Routledge: London, UK, 2023; pp. 48–74.
21. Uflewski, O.; Wong, T.; Ward, M. Capability management of manufacturing research centres: Challenges and opportunities. *Int. J. Manuf. Technol. Manag.* **2024**, *38*, 143–171. [CrossRef]
22. OECD. *OECD Science, Technology and Industry Outlook 2012*; OECD: Paris, France, 2012.
23. Swan, W. *Australia to 2050: Future Challenges*; Commonwealth of Australia Canberra: Canberra, Australia, 2010.
24. The State of Australia's Skills 2021: Now and into the Future. 2021. Available online: <https://www.voced.edu.au/content/ngv:92342> (accessed on 27 October 2023).
25. Future-Proofing Skills. 2023. Available online: <https://www.futureskillsorganisation.com.au/about-us/#aboutus-anchor1> (accessed on 27 October 2023).
26. Lee, U.-W. Shift to value-creating economy is the way to go: Swee Keat. *Bus. Times* **2015**, *5*. Available online: <https://www.businesstimes.com.sg/international/shift-value-creating-economy-way-go-swee-keat> (accessed on 4 November 2015).
27. Schwab, K. *The Fourth Industrial Revolution*; Crown Currency: Preston, Australia, 2017.
28. Ng, D. System leadership for future-ready learners in Singapore. In *Leading Education Systems*; Emerald Publishing Limited: Bingley, UK, 2021; pp. 111–131.
29. Lado, A.A.; Wilson, M.C. Human resource systems and sustained competitive advantage: A competency-based perspective. *Acad. Manag. Rev.* **1994**, *19*, 699–727. [CrossRef]
30. Pfeffer, J. Mortality, reproducibility, and the persistence of styles of theory. *Organ. Sci.* **1995**, *6*, 681–686. [CrossRef]
31. Wright, P.M.; McMahan, G.C.; McWilliams, A. Human resources and sustained competitive advantage: A resource-based perspective. *Int. J. Hum. Resour. Manag.* **1994**, *5*, 301–326. [CrossRef]
32. Elliot, A.J.; Thrash, T.M. The intergenerational transmission of fear of failure. *Personal. Soc. Psychol. Bull.* **2004**, *30*, 957–971. [CrossRef]
33. Van Bavel, J.; Reher, D.S. The baby boom and its causes: What we know and what we need to know. *Popul. Dev. Rev.* **2013**, *39*, 257–288. [CrossRef]
34. Australian Government Centre for Population. Australia's Future Fertility: A Quick Guide to Potential Impacts on Future Population. 2023. Available online: https://population.gov.au/sites/population.gov.au/files/2023-03/quickguide-australias-future-fertility_0.pdf (accessed on 27 October 2023).
35. Commission, P. Economic Implications of an Ageing Australia. 2005. Available online: <http://www.pc.gov.au/study/ageing/finalreport/ageing1.pdf> (accessed on 3 October 2015).
36. Ardaiz-Villanueva, O.; Nicuesa-Chacón, X.; Brene-Artazcoz, O.; Sanz de Acedo Lizarraga, M.L.; Sanz de Acedo Baquedano, M.T. Evaluation of computer tools for idea generation and team formation in project-based learning. *Comput. Educ.* **2011**, *56*, 700–711. [CrossRef]
37. Low, L.F. Confronting Ageing: The Talk Australia Has to Have. Available online: <https://www.sydney.edu.au/news-opinion/news/2023/10/09/confronting-ageing-the-talk-australia-has-to-have.html> (accessed on 9 October 2023).
38. Intergenerational Report 2023-Australia's Future to 2063. 2023. Available online: <https://treasury.gov.au/publication/2023-intergenerational-report> (accessed on 24 August 2023).
39. Population by Age and Sex, Australian States and Territories, June 2010. 2010. Available online: <https://www.abs.gov.au/ausstats/abs@.nsf/mf/3201.0> (accessed on 30 June 2010).
40. Australia to 2050: Future Challenges. 2010. Available online: <https://ministers.treasury.gov.au/ministers/wayne-swan-2007/media-releases/australia-2050-future-challenges> (accessed on 1 February 2010).
41. Abdi, S.; Spann, A.; Borilovic, J.; de Witte, L.; Hawley, M. Understanding the care and support needs of older people: A scoping review and categorisation using the WHO international classification of functioning, disability and health framework (ICF). *BMC Geriatr.* **2019**, *19*, 1–15. [CrossRef] [PubMed]
42. Lixia, Q.; Jennifer, B. Births in Australia. 2023. Available online: <https://aifs.gov.au/research/facts-and-figures/births-australia-2023> (accessed on 31 October 2023).
43. Face the Facts: Cultural and Racial Diversity. 2024. Available online: <https://humanrights.gov.au/our-work/education/statistics-about-cultural-and-racial-diversity> (accessed on 1 February 2014).
44. Australia's Population by Country of Birth. 2022. Available online: <https://www.abs.gov.au/statistics/people/population/australias-population-country-birth/latest-release> (accessed on 31 October 2023).
45. Migration, Australia, 2011–2012 and 2012–2013. 2013. Available online: <https://www.abs.gov.au/ausstats/abs@.nsf/Product/s/3412.0~2011-12+and+2012-13~Chapter~Net+Overseas+Migration?OpenDocument> (accessed on 28 June 2015).
46. Australia's Migration Trends 2013–2014. 2014. Available online: <https://www.abs.gov.au/ausstats/abs@.nsf/lookup/3412.0Media%20Release12013-14> (accessed on 29 January 2015).
47. Markus, A. Attitudes to immigration and cultural diversity in Australia. *J. Sociol.* **2014**, *50*, 10–22. [CrossRef]

48. Arasaratnam, L.A. A discussion of multiculturalism in Australia from educators' perspective. *SpringerPlus* **2014**, *3*, 36. [CrossRef]
49. Benet-Martínez, V.; Lee, F.; Leu, J. Biculturalism and cognitive complexity: Expertise in cultural representations. *J. Cross-Cult. Psychol.* **2006**, *37*, 386–407. [CrossRef]
50. Rizvi, F. Multiculturalism in Australia: The construction and promotion of an ideology. *J. Educ. Policy* **1988**, *3*, 335–350. [CrossRef]
51. Kane, J. From Ethnic Exclusion to Ethnic Diversity: The Australian Path to Multiculturalism. *Nomos* **1997**, *39*, 540–571.
52. Head, L.; Adams, M.; McGregor, H.V.; Toole, S. Climate change and Australia. *Wiley Interdiscip. Rev. Clim. Chang.* **2014**, *5*, 175–197. [CrossRef]
53. Ansley, G. Warming to Hit Pockets: Report. Available online: <https://www.nzherald.co.nz/world/warming-to-hit-pockets-report/VDRKDIU6Q2ELUO5UQ2HFGGSF3U/> (accessed on 1 February 2010).
54. Garnaut, R. *The Garnaut Review 2011: Australia in the Global Response to Climate Change*; Cambridge University Press: Cambridge, UK, 2011.
55. State of the Climate 2022. 2022. Available online: <http://www.bom.gov.au/state-of-the-climate/> (accessed on 23 November 2022).
56. Gallant, A.J.; Karoly, D.J. A combined climate extremes index for the Australian region. *J. Clim.* **2010**, *23*, 6153–6165. [CrossRef]
57. State of the Climate 2020. 2020. Available online: <http://www.bom.gov.au/state-of-the-climate/2020/> (accessed on 13 November 2020).
58. IPCC. *Climate Change 2022: Impacts, Adaptation and Vulnerability*; Cambridge University Press: Cambridge, UK, 2022.
59. Puncreobutr, V. Education 4.0: New challenge of learning. *St. Theresa J. Humanit. Soc. Sci.* **2016**, *2*, 92–97.
60. Alexander, E.R. Design in the decision-making process. *Policy Sci.* **1982**, *14*, 279–292. [CrossRef]
61. Ng, D.F.S.; Wong, C.P.; Liu, S. *Future-Ready Learners: Learning, Lifework, Living, and Habits of Practices*; National Institute of Education (NIE), Nanyang Technological University: Singapore, 2020.
62. Clark, S.; Harbaugh, A.G.; Seider, S. Fostering adolescent curiosity through a question brainstorming intervention. *J. Adolesc.* **2019**, *75*, 98–112. [CrossRef] [PubMed]
63. Hulme, E.; Green, D.T.; Ladd, K.S. Fostering Student Engagement by Cultivating Curiosity. *New Dir. Stud. Serv.* **2013**, *2013*, 53–64. [CrossRef]
64. Watson, L. Curiosity and inquisitiveness. In *The Routledge Handbook of Virtue Epistemology*; Routledge: London, UK, 2018; pp. 155–166.
65. Ng, D.F.S.; Wong, C.P. The role of school leadership in Singapore's future-ready school reform. *Eur. J. Educ.* **2020**, *55*, 183–199. [CrossRef]
66. Begus, K.; Southgate, V. Infant pointing serves an interrogative function. *Dev. Sci.* **2012**, *15*, 611–617. [CrossRef] [PubMed]
67. Silvia, P.J. Curiosity and motivation. *The Oxford handbook of human motivation* **2012**, *550*, pp. 157–166.
68. Baumgarten, E. Curiosity as a moral virtue. *Int. J. Appl. Philos.* **2001**, *15*, 169–184. [CrossRef]
69. Baehr, J. *Intellectual Virtues and Education*; Taylor & Francis: Oxford, UK, 2016.
70. Brady, M. Curiosity and the Value of Truth. In *Epistemic Value*; Pritchard, D., Millar, A., Haddock, A., Eds.; Oxford University Press: Oxford, UK, 2009; pp. 265–283.
71. Watson, L.; Inan, I.; Whitcomb, D.; Yigit, S. Educating for curiosity. In *The Moral Psychology of Curiosity*; Inan, I., Watson, L., Whitcomb, D., Yigit, S., Eds.; Rowman & Littlefield: London, UK, 2018; pp. 293–309.
72. Litman, J.A.; Spielberger, C.D. Measuring epistemic curiosity and its diversive and specific components. *J. Personal. Assess.* **2003**, *80*, 75–86. [CrossRef] [PubMed]
73. Runco, M.A.; Plucker, J.A.; Lim, W. Development and psychometric integrity of a measure of ideational behavior. *Creat. Res. J.* **2001**, *13*, 393–400. [CrossRef]
74. Gonçalves, M.; Cash, P. The life cycle of creative ideas: Towards a dual-process theory of ideation. *Des. Stud.* **2021**, *72*, 100988. [CrossRef]
75. Guilford, J.P. Creativity: Yesterday, today and tomorrow. *The Journal of Creative Behavior* **1967**, *1*, 3–14. [CrossRef]
76. Thorsteinsson, G. ICT to Support Ideation via General Education. *J. Sch. Educ. Technol.* **2014**, *9*, 29–39. [CrossRef]
77. Ackoff, R. A concept of corporate planning. *Long Range Plan.* **1970**, *3*, 2–8. [CrossRef]
78. Basadur, M.; Graen, G.B.; Green, S.G. Training in creative problem solving: Effects on ideation and problem finding and solving in an industrial research organization. *Organ. Behav. Hum. Perform.* **1982**, *30*, 41–70. [CrossRef]
79. Reinig, B.A.; Briggs, R.O. On the relationship between idea-quantity and idea-quality during ideation. *Group Decis. Negot.* **2008**, *17*, 403–420. [CrossRef]
80. Lumsdaine, E.; Lumsdaine, M. Creative problem solving. *IEEE Potentials* **1994**, *13*, 4–9. [CrossRef]
81. Christie, E.J.; Jensen, D.D.; Buckley, R.T.; Menefee, D.A.; Ziegler, K.K.; Wood, K.L.; Crawford, R.H. Prototyping strategies: Literature review and identification of critical variables. In Proceedings of the 2012 ASEE Annual Conference & Exposition, San Antonio, TX, USA, 10–13 June 2012.
82. Cheng, K.; Chua, J.X.T. Debate over CMIO model as diversity grows. *Today*, 8 August 2017. Available online: <https://www.todayonline.com/singapore/debate-over-cmio-model-diversity-grows> (accessed on 8 August 2017).
83. Gerber, E.; Carroll, M. The psychological experience of prototyping. *Des. Stud.* **2012**, *33*, 64–84. [CrossRef]
84. Carlen, J. *A Brief History of Entrepreneurship: The Pioneers, Profiteers, and Racketeers Who Shaped Our World*; Columbia University Press: New York, NY, USA, 2016.

85. Australian Small Business-Key Statistics and Analysis. 2012. Available online: <https://treasury.gov.au/publication/australian-small-business-key-statistics-and-analysis> (accessed on 1 December 2012).
86. Urban, B. Cognitions and motivations for new venture creation decisions: Linking expert scripts to self-efficacy, a South African study. *Int. J. Hum. Resour. Manag.* **2010**, *21*, 1512–1530. [\[CrossRef\]](#)
87. Mitchell, R.K.; Busenitz, L.; Lant, T.; McDougall, P.P.; Morse, E.A.; Smith, J.B. Toward a theory of entrepreneurial cognition: Rethinking the people side of entrepreneurship research. *Entrep. Theory Pract.* **2002**, *27*, 93–104. [\[CrossRef\]](#)
88. Mitchell, R.K.; Smith, B.; Seawright, K.W.; Morse, E.A. Cross-cultural cognitions and the venture creation decision. *Acad. Manag. J.* **2000**, *43*, 974–993. [\[CrossRef\]](#)
89. Vaughn, B. What Is Inclusive Intelligence? Changing the D&I Landscape. n.d. Available online: <https://diversityofficermagazine.com/what-is-inclusive-intelligence/> (accessed on 22 October 2020).
90. Nishii, L.H. The benefits of climate for inclusion for gender-diverse groups. *Acad. Manag. J.* **2013**, *56*, 1754–1774. [\[CrossRef\]](#)
91. Fiol, C.M.; Pratt, M.G.; O'Connor, E.J. Managing intractable identity conflicts. *Acad. Manag. Rev.* **2009**, *34*, 32–55. [\[CrossRef\]](#)
92. Koleth, E. Multiculturalism: A Review of Australian Policy Statements and Recent Debates in Australia and Overseas. 2010. Available online: <https://apo.org.au/node/22862> (accessed on 8 May 2014).
93. Alexandru, F. The context for developing intercultural communicative competence. *Euromentor J. Stud. About Educ.* **2012**, 35–53.
94. Vallerand, R.J.; Blanchard, C.; Mageau, G.A.; Koestner, R.; Ratelle, C.; Léonard, M.; Gagné, M.; Marsolais, J. Les passions de l'ame: On obsessive and harmonious passion. *J. Personal. Soc. Psychol.* **2003**, *85*, 756. [\[CrossRef\]](#)
95. Perrewé, P.L.; Hochwarter, W.A.; Ferris, G.R.; McAllister, C.P.; Harris, J.N. Developing a passion for work passion: Future directions on an emerging construct. *J. Organ. Behav.* **2014**, *35*, 145–150. [\[CrossRef\]](#)
96. Vallerand, R.J. On passion for life activities: The dualistic model of passion. In *Advances in Experimental Social Psychology*; Elsevier: Amsterdam, The Netherlands, 2010; Volume 42, pp. 97–193.
97. Marsh, H.W.; Vallerand, R.J.; Lafrenière, M.-A.K.; Parker, P.; Morin, A.J.; Carbonneau, N.; Jowett, S.; Bureau, J.S.; Fernet, C.; Guay, F. Passion: Does one scale fit all? Construct validity of two-factor passion scale and psychometric invariance over different activities and languages. *Psychol. Assess.* **2013**, *25*, 796. [\[CrossRef\]](#) [\[PubMed\]](#)
98. Deci, E.L.; Ryan, R.M. The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychol. Inq.* **2000**, *11*, 227–268. [\[CrossRef\]](#)
99. Bonneville-Roussy, A.; Lavigne, G.L.; Vallerand, R.J. When passion leads to excellence: The case of musicians. *Psychol. Music.* **2011**, *39*, 123–138. [\[CrossRef\]](#)

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