

# 21<sup>ST</sup> CENTURY TEACHING AND LEARNING

*Educating for a rapidly changing world*

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**Entrepreneurship, Employability and Education (E<sup>3</sup>) in Schools**

**Literature Review**

**September 2019**

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## PREFACE

Due to historical and contextual challenges, South Africa's education system continues to fail to develop school leavers with the requisite competencies to succeed in a rapidly changing world. There is widespread consensus that the way in which learners are taught in South African schools fails to develop school leavers with the cognitive, emotional and social competencies to live full lives and contribute meaningfully to the country's well-being as active social, political and economic agents. Although some strides have been made towards the progressive realization of the right to basic education for all in the post-Apartheid era, the country's education system remains in crisis. This continues to be a major risk to South Africa's ability to remain globally competitive and responsive to the new challenges and opportunities presented by the 21<sup>st</sup> century.

In 2018, the DBE launched the **Entrepreneurship, Employability and Education (E<sup>3</sup>) in Schools** programme, which is an initiative that seeks to change the education status quo by transforming the manner in which teaching and learning takes place in South African schools. Through empowering teachers to implement Progressive Learning Methodologies (PLMs)<sup>1</sup> in every lesson in order to facilitate active, critical and holistic learning, the programme seeks to develop 100% of South African school leavers who are:

- 1) prepared to start their own ventures (**ENTREPRENEURSHIP**);
- 2) able to find jobs (**EMPLOYABILITY**); or
- 3) are prepared for further learning (**EDUCATION**).

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<sup>1</sup> PLMs are a reaction to traditional styles of teaching, which emphasize rote learning and memorization. They are pedagogical practices that value "learning by doing", or experiential learning, and emphasize using hands-on projects as a tool to engage learners in activities that develop their problem-solving, critical thinking, creativity and collaboration skills (Kennedy 2019).

The programme's current theory of change (ToC) emphasizes the role of institutional stakeholders and mechanisms; the schooling environment and the surrounding ecosystem as critical to lasting educational transformation; however, at its core, the theory positions teachers and learners as lying at the heart of system change. E<sup>3</sup> recognizes the “Instructional Core” (Elmore 2008)—teachers and learners in the presence of content—as pivotal to creating the epistemic shifts required to drive change at scale. The programme champions PLMs as a way of doing what bell hooks (1994, 12) refers to as “interven(ing), alter(ing) and disrupt(ing) the classroom atmosphere” in order to shift core beliefs and attitudes about teaching and learning, as well as to realize the following three programme pillars:

- 1) equipping learners with 21<sup>st</sup> century skills;
- 2) developing personal agency through unlocking a mindset that produces value and usefulness to others; and
- 3) developing a belief in self and ability (Worthington-Smith 2008, 4).

The vision of E<sup>3</sup> is to create a new generation of engaged South African citizens, who are prepared and enabled, through the schooling system, to build the economic engine of the country. By transforming teaching and learning in South African classrooms, the programme seeks to create the building blocks of an entrepreneurial nation, which is capacitated to address socio-economic challenges, including poverty and unemployment.

E<sup>3</sup>'s core approach to programme implementation focuses on three key intervention mechanisms, which are enabled by advocacy and monitoring and evaluation (M&E). These are:

- 1) training provincial master trainers to train teachers;
- 2) providing teacher development and support; and
- 3) transforming teaching and learning in the classroom.

A three-year pilot was launched in 2019 to test the core intervention and roll-out mechanisms. The 2019 – 2021 Pilot Phase will be rolling out the E<sup>3</sup> programme to 180+ schools across 3 subjects (Life Skills, EMS and Life Orientation) from Grades 4 to 11, which will be phased in the 9 provinces.

As a programme that seeks to activate 21<sup>st</sup> century teaching and learning in South African classrooms and embed progressive mindsets in the education system to drive specific economic and social outcomes, the E<sup>3</sup> programme naturally becomes embedded in the discourse, and debate, around the educational imperatives of what competences learners need in the 21<sup>st</sup> century knowledge economy and digital age; what methodologies should be used to develop these and how they should be assessed. The aim of this literature review is to document evidence supporting E<sup>3</sup>'s ToC, with a particular focus on the teacher-learner-content dynamic. The review will serve as one of the foundational documents to inform the continued iteration of the programme strategy and approach, as well as ongoing M&E activities in the 2019 – 2021 Pilot Phase, including the baseline/situational analysis.

# 1. INTRODUCTION

In the context of a rapidly changing world, the role of education and its potential not only to transform individual lives, but also its power to transform societies and, ultimately, create a more just and equitable world, remains at the forefront of both national and global agendas. There is acknowledgement that this third millennium bears distinctive features that set it apart from preceding historical periods (Tan et al. 2017, 425). Dubbed the “Creative Age”, “Digital Age”, “Conceptual Age” or “Knowledge Age”, the 21st century has been characterized by unprecedented economic, sociological and epistemological shifts, which have significantly altered both industry and society (van de Oudeweetering and Voogt 2017, 116; Tan et al. 2017, 425). In industry, while “standardization and mass production” were suited to an industrial mode of production, the current “digital revolution” has replaced manual and routine mental labour (i.e. repetitive tasks) with ideas, innovation and personalized services (Ananiadou and Claro 2009; Voogt and Roblin 2012, 200). These in turn are argued to function as commodities in the new “knowledge economy” and are said to drive growth and social mobility (Tan et al. 2017, 425; Voogt and Roblin 2012, 300). Advanced technologies have also come to permeate all aspects of daily and social life (Marope, Griffin, and Gallagher 2017, 12). Increased interconnectivity; heightened integration between the physical and the virtual and the interfacing of humans with machines has led to fundamental shifts in how we relate to one another and the world around us.

These shifts in our social and economic landscape have led to increased pressure on national education systems around the world to adapt and respond to the new human capital demands of industries and workplaces, and more importantly, to the social values and attitudes of the individuals that these systems produce (Tan et al. 2017, 425). There is a high degree of consensus amongst national governments, policymakers, educational scholars, practitioners and global education communities that as the “new” economy of the 21<sup>st</sup> century continues to develop around service, knowledge and information-based activities, education as a key source



of “lifelong learning, adaptability, agility and resilience” remains extremely significant (Marope, Griffin, and Gallagher 2017, 12; Tan et al. 2017, 425). Our present and future context demand a workforce with higher-level (or higher-order thinking) skills and call for a wider range of “multifaceted, transdisciplinary, and integrated competences” (Marope, Griffin, and Gallagher 2017, 12).

The growing need for higher-order thinking skills has led to increased demand for tertiary education globally. Research in the United States (US) shows that from 1973 to 2000, the percentage of workers with some post-secondary education increased by 110%; whilst the percentage of workers with bachelor’s degrees increased by 120% (Boyles 2012, 43). In the South African context, a university degree is generally considered a necessary step to a meaningful career and research suggests that individuals with bachelor’s degrees earn higher salaries, have better professional mobility and lead more fulfilled lives than their counterparts with senior certificates or diplomas (van Broekhuizen and van der Berg 2013).

However, the paradox lies in the fact that, although the world is producing more higher education graduates than before, recent studies show that there is a gap between what graduates are able to do and the skills employers are seeking. According to Boyles (2012), newly hired graduates often “have not mastered the higher-level knowledge and information-based skills at the levels that employers expect or need from them”. In a study conducted by the American Society for Training and Development (ASTD) in 2009, companies were asked to rank skills that they desired of their new employees. Companies ranked leadership, critical thinking and creativity amongst the highest, and a large majority of the organizations that were surveyed rated that university graduates are deficient in these skills (Boyles 2012, 43). A similar study was conducted by Tony Wagner in 2008 and, based on several hundred interviews with business, non-profit and education leaders, he found that employers were looking for a particular set of skills that enable graduates to add value in the world of work. These are “critical thinking and problem solving; collaboration and leadership; agility and adaptability; initiative and entrepreneurialism; effective oral and written

communication; accessing and analyzing information and curiosity and imagination” (Wagner 2008). Similarly, Wagner’s respondents found that graduates are not taught these “new survival skills” at school, which has an impact on their ability to contribute meaningfully to the organizations they become a part of.

Practicing entrepreneurs have also indicated that they are negatively affected by the shortage of skilled workers, as it inhibits the growth of their companies and hinders the development of new entrepreneurial firms (Boyles 2012, 43). Citing research conducted by the Kauffman Foundation in 2007 on what leads to success in entrepreneurship, Boyles argues that workers who possess higher-order thinking skills and knowledge—combined with the absence of the fear of putting those skills to use and taking risks to generate and commercialize new ideas, products and services—are necessary to foster a culture of entrepreneurship (Boyles 2012, 43).

The above findings highlight two things: the first is the recognition by different players in education and industry that learners/graduates need a different set of skills to meet the challenges and opportunities of the 21<sup>st</sup> century; and the second is that education systems are failing to equip learners with these skills. This has led to increased calls for the development of new frameworks and methodologies for teaching and learning, which go against the grain of traditional methods. Educators at all levels of the system are being asked to recognize the unprecedented changes in today’s economy and to make the necessary shifts in order to ensure that learners develop the higher-order thinking skills that they will need as employers, managers, entrepreneurs and meaningful contributors to the new knowledge economy. These skills for a new age have come to be commonly known as 21<sup>st</sup> century skills or competences (21CC)<sup>2</sup>.

Although there has been some convergence around what a “menu” of 21CC should include, different organizations, multilateral agencies and individuals define, specify, group and attach

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<sup>2</sup> Some scholars make a distinction between 21<sup>st</sup> century skills and 21<sup>st</sup> century competences. This paper uses 21<sup>st</sup> century competences as a category to capture the thinking knowledge, skills, abilities and character that are required for learners to thrive in the 21<sup>st</sup> century.

emphasis to different skills in different ways. There is also diversity in the expression of the accompanying teaching, learning and assessment approaches associated with the implementation of these skills in school curricula. Therefore, there are no definitive answers about what 21<sup>st</sup> century learners need in order to thrive and actively contribute to political, social and economic futures in ways that are both locally responsive and globally relevant. How these competences should be more effectively taught, learnt and assessed, in both formal and informal educational contexts, also remains contested.

As the South African education system remains under pressure to help realize the constitutional promise of a life of freedom, dignity and equality for all South Africans, and as it continues to struggle to adapt to a rapidly changing world, new solutions are required to drive education transformation and narrow the gaps that exist in the system. This paper explores and outlines some of the solutions that have been offered in 21<sup>st</sup> century and entrepreneurship education discourse. Through focusing on seminal texts in these two bodies of literature, the paper seeks to answer the following key questions:

1. What is the nature of South Africa's education problem?
2. What are 21<sup>st</sup> century skills and/or competences and which are considered important for the modern world?
3. What is the role of 21<sup>st</sup> century teaching and learning in helping to resolve some of South Africa's enduring problems in education?
4. What methodologies are best suited to facilitate 21<sup>st</sup> century learning and what is the role of progressive education in achieving this?
5. What are the implications of the demands of 21<sup>st</sup> century teaching and learning for teachers and teacher educators?

## 2. THE STATE OF EDUCATION IN SOUTH AFRICA

Today's South African learner exists in a complex milieu of socio-economic challenges and, in a contemporary world, is exposed to many ever-evolving opportunities and vulnerabilities. The challenges in South Africa's education system, some historical, are well-documented and range from policy and system-related issues, as well as teacher and learner-related challenges. Some of the key challenges include uninspired and ineffective teachers, with inadequate subject knowledge and pedagogical expertise; inadequate teacher support; poor curriculum coverage and hostile learning environments, which lead to unmotivated learners who consistently perform poorly, particularly in relation to their global counterparts. This section discusses the troubling state of South Africa's education system, outlining some of the key challenges identified by scholars and practitioners. The section then highlights some of the arguments that have been made for 21<sup>st</sup> century teaching and learning and entrepreneurship as means to address some of these challenges.

### 2.1. Failing to Address the Historical Legacies of Apartheid: Enduring Inequality

The primacy of education as a tool for economic and social justice reform in the South African context is largely shaped by its Apartheid past, which denied the majority black population access to good, quality education. Under Apartheid, public education was a privilege that Whites alone fully enjoyed. Black Africans were subjected to the Bantu Education system, which rested on racist anthropology designed to generate cheap labour for South Africa's economy. One of the consequences of this approach was that the Bantu Education system deliberately neglected education in science and mathematics for Black people. Similarly, Coloureds and Indians were also treated as presumptively subordinate minorities and received an unequal education to Whites. Having inherited an education system profoundly shaped by political, economic and social inequalities, the newly elected democratic government of 1994 was faced

with the challenge of establishing a non-discriminatory and non-racial education system (Asmal and Wilmot 2001, 186).

As a response to Apartheid legacies, the approach to education initiated in 1994 is grounded in the Constitution and its principles of non-racism, non-sexism, and equality of access (Asmal and Wilmot 2001, 186). The Constitution declared the right of all “to a basic education” and committed the new democratic government to the values of human dignity and equality (Badat 2009, 3). The 1995 White Paper on Education and Training entrusted the state to “advance and protect” citizens so that they “have the opportunity to develop their capabilities and potential”. It also directed the state to “redress educational inequalities among those sections of our people who have suffered particular disadvantages” and the principle of “equity” so that all citizens have “the same quality of learning opportunities” (DoE 1995, 21-22). A year later the National Education Policy Act of 1996 stated its goal of “the democratic transformation of the national system of education into one which serves the needs and interests of all of the people of South Africa and upholds their fundamental rights” (Republic of South Africa, 1996).

The Constitution, along with a number of different policies and laws, point to the fact that the goals and imperatives of South Africa’s education system are deep and wide-ranging. It is understood that the progressive substantive realization of these will profoundly contribute to the transformation and development of society and lead to greater equality. However, South Africa’s continued racialized and gendered socio-economic inequalities point to the failures and unmet expectations of this constitutional vision.

In his paper on the enduring legacy of Apartheid in South Africa’s education system, van der Berg (2007, 2) shows that although there has been some reduction in racial differences with respect to quantitative educational attainment, there remain huge disparities in the quality of education being delivered to previously disadvantaged communities as compared to white privileged minorities. Public schools in peri-urban and rural areas make up 75% of South Africa’s schooling system—attended by predominantly poor black children—and continue to be under-resourced, over-crowded and dysfunctional. According to van der Berg, South Africa’s

education system contributes insufficiently to supporting the upward mobility of poor children in the labour market, mainly because of the continued weak performance of many black schools. He argues that the racial composition of a school, along with socio-economic background, remains a major explanatory factor in determining matriculation pass rates.

In a 2012 study, Spauld highlights the dualistic nature of primary education in South Africa. Using the analysis of the results of learner performance in national and international standardized tests, he shows that only 25% of South African learners, who attend mostly functional schools, perform acceptably in these tests; whilst the majority of learners (roughly 75%) perform extremely poorly (Spauld 2013). Similar to van der Berg, Spauld (Spauld 2013, 2012) goes on to argue that children's socio-economic status is one of the most important factors influencing learner outcomes. In South Africa, a child's race, birth province and parental wealth determines their educational opportunities. And since educational outcomes directly determine labour market participation, black people with low levels of education are victims of "sustained unemployment" (The Daily Vox 2019).

Racialized (and gendered) inequalities in South Africa's education system therefore continue to have material effects. Results from the 2015 Trends in International Maths and Science Study (TIMSS) show that only 48% of black Grade 3 learners pass mathematics, while 85% of their white counterparts succeed. In the higher education, context, a 2013 study by the Council for Higher Education showed that only 13% of young black people are enrolled in higher education institutions, compared to 54% of white students (CHE 2016, 5). Completion rates also remain heavily skewed by race and prior education, with white completion rates found to be 50% higher than those of black students (CHE 2016, 5).

## **2.2. Challenges Facing Learners**

In the context of large inequality and disparities, South African learners face a number of obstacles and hardships that contribute to them having low motivation for school and a

diminished love for learning. Mouton, Louw and Strydom (2012) assert that the rate of late-coming and absenteeism is indicative of this. The authors speak to the frequency to which one can see learners in many parts of the country “being late, dawdling outside school grounds and leaving schools early”. The Department of Education has implemented a number of initiatives and incentives over the years, in an attempt to improve school attendance (Jones 2011). Some of these initiatives include nutrition programmes, the establishment of no-fee schools, and the provision of workbooks and textbooks.

However, there are persistent challenges, which continue to adversely affect learner motivation. According to Mouton, Louw and Strydom (2012), in 2011, approximately 20% of learners dropped out of school after Grade 3; 40% after Grade 9, and about 70% after Grade 11. At the time, this translated to less than a quarter of learners who start Grade 1 making it to, and completing, Grade 12 (Mouton, Louw, and Strydom 2012, 33). Amongst other factors, low throughput rates are also compounded by grade repetition. In 2011, Rademeyer (2012) found that of the 11 million learners enrolled in schools, 1.2 million (11.1%) of them had to repeat a grade. The bulk of these were learners in higher grades, with grade repetition rates sitting at 24.7% for learners in Grade 11 and 22.9% for learners in Grade 12. The grade repetition rate for learners in primary school in 2012 sat at roughly 7%, which was higher than the 5% repetition rate of other developing countries and 1% of developed countries (Mouton, Louw, and Strydom 2012, 33).

According to Spaul's recent article, which articulates what the priorities for education reform in South Africa should be in 2019 and beyond, school throughput rates to university remain low (Spaul 2019). School performance data shows that, out of 100 students who start school, 50 – 60 will make it to matric, 14 will qualify for university and only 6 will get an undergraduate qualification within 6 years (Spaul 2019).

Mouton, Louw and Strydom (2012) explore some of the factors that lead to learners disengaging from school and eventually dropping out. Some of these include, but are not limited to, teenage pregnancy, substance abuse, and a serious lack of stimulation and support. The

authors also highlight hostile school environments as a significant contributory factor. As social issues that affect communities often spill over into schools, many South African schools are plagued by violence. Some of the issues that South African schools have had to grapple with include sexual assault and gang violence within schools—with high risks of serious injuries and fatalities. The risk of violence also extends to when learners have to commute to and from school. Various incidents of violence involving learners, which have been captured on various social media platforms in recent years, raise serious concerns about learner safety and the endemic nature of violence in South Africa, with no real prospect of improvement.

Learners in South African schools also continue to perform poorly. The TIMSS, the Progress in International Reading and Literacy Study (PIRLS), and the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) assessments show that, when compared to their global counterparts, South African learners perform well below their academic potential in relation to literacy and numeracy. The recent PIRLS study (2016) showed that 78% of South African Grade 4 children could not read for meaning in any language—that is they could not “locate and retrieve an explicitly stated detail” (Spaull 2019). According to the PIRLS Intermediate International Benchmark, in 45% of South African Grade 4 classrooms, there was not a single student that could read in their home language and make inferences. Spaull (2019) refers to this nearly fifty percent of Grade 4 classrooms as “cognitive wastelands”, which require radical intervention to improve results. According to the TIMSS (2015), 61% of South African Grade 5 learners could not do basic mathematics—that is they could not add and subtract whole numbers, have no understanding of multiplication by one-digit numbers and cannot solve simple word problems (Spaull 2019).

### **2.3. Challenges Facing Teachers**

Teacher-related issues are often cited as the most significant challenges facing public schools in South Africa, particularly in relation to the poor training and inadequate support provided to



teachers. There is now a large body of evidence attesting to the fact that the majority of South African teachers do not currently have the content knowledge or pedagogical skills necessary to impart the curriculum (Mouton, Louw, and Strydom 2012; Spaul 2019). In a nationally representative sample of primary schools, it was found that 79% of Grade 6 Mathematics teachers could not score 60% or higher on Grade 6 or 7 level questions (Spaul 2019).

In a study conducted on teacher well-being in a region of the Free State in 2004, Pienaar and Van Wyk (2006) identified the lack of teaching experience; poor training and support; operating in large, under-resourced classrooms; overcrowding and violence in schools as some of the factors that lead to teacher burnout in South Africa. In the context of the Free State in particular, teachers surveyed reported high workload and poor remuneration as other key contributing factors (Pienaar and van Wyk 2006, 542).

Another major contributing factor to teachers' stress and underperformance has been found to be the resulting uncertainties of "constant curriculum change (Mouton, Louw, and Strydom 2012, 34). When the new democratic government implemented Outcomes Based Education (OBE) in 1996, teachers experienced it as a product of a bureaucratically driven curriculum process where a "top-down" management style took teachers aback and left them uncertain about their knowledge, skills and contribution to South Africa's education system (Mouton, Louw, and Strydom 2012, 34). The fundamental changes for assessment proposed by OBE also contributed substantially to teachers' negative reactions and resistance, as they found it difficult to maintain a balance between teaching and assessment time (Mouton, Louw, and Strydom 2012, 34). Teachers also felt that a lack of sustained professional development was a serious shortcoming of the introduction of the OBE curriculum (Mouton, Louw, and Strydom 2012, 34).

The most recent (2011) review of the South African basic education curriculum, known as the Curriculum and Assessment Policy Statement (CAPS), felt to some teachers like a repetition of the mistakes that were made with OBE—with CAPS, teachers did not receive adequate training to cope with the changes and inadequate departmental support and guidance, as well as the lack

of physical resources and teaching and learning support material, continue to be a source of anxiety and stress for teachers (Mouton, Louw, and Strydom 2012, 35)

Teacher morale in many South African schools is reported to be extremely low and has an impact on the quality of teaching and learning. A 2010 study conducted with South African teachers found that a large majority are uncertain about their own futures in education, as well as the future of education itself in South Africa (Mouton, Louw, and Strydom 2012, 35). Some of their fears and concerns included the political and economic climate in the country; changes in policies and curriculum; high rates of teacher attrition; unsafe school environments; unsatisfactory working conditions; the declining quality of education; role conflict; unprofessional conduct of educators; lack of coordinated training workshops; poor management and leadership in schools and a lack of accountability (Mouton, Louw, and Strydom 2012, 35).

Undue political influence by the majority teacher union, the South African Democratic Teachers Union (SADTU), also continues to be a major challenge in the South African school system. An authoritative 2016 report by a Ministerial Task Team formed to investigate fraud and corruption in the sector, and specifically the sale of teacher and principal post for cash and livestock, unveiled some of the accountability problems in education (Spaull 2019). According to the report, SADTU was in “de facto control” of the education departments in six of the nine provinces in the country. The investigators reported that “all the Deputy Directors-General in the Department of Basic Education are SADTU members and attend meetings of that Union” and conclude that, “it is not improbable to say that schooling throughout South Africa is run by SADTU” (Spaull 2019).

## **2.4. Socio-Economic Challenges**

In recent years, South Africa’s declining economic growth prospects have become a major source of concern for political actors, business and society alike. The country’s high, and rising, levels of unemployment and poverty in particular have been disquieting. According to recent

results of the Quarterly Labour Force Survey (QLFS), for the second quarter of 2019, the official unemployment rate increased by 1,4 percentage points to 29% compared to the first quarter of 2019 (Stats SA 2019b). Young people, aged 15–24 years, are the most vulnerable in the South African labour market. The unemployment rate among this age group was 55,2% in the first quarter of 2019 (Stats SA 2019a). Among graduates in this age group, the unemployment rate was 31% during this period compared to 19,5% in the 4th quarter of 2018, marking an increase of 11,4 percentage points quarter-on-quarter (Stats SA 2019a). However, the graduate unemployment rate is still lower than the rate among those with lower educational levels, meaning that education is still the key to improving young people's prospects in the labour market (Stats SA 2019a).

The Southern Africa Labour and Development Research Unit (SALDRU) has developed and recently released an income comparison tool, which highlights the stark income disparities and gives a startling picture of the dynamics of poverty in South Africa (Business Tech 2019). The income comparison tool allows individuals to see where their salary and household income fall in correlation to the rest of the country. According to SALDRU's research:

- 10% of South Africans have an income of R345 or less per month;
- If an individual earns more than R1149 per month, then they earn more than half of the country;
- If an individual has a salary of R7313 or more, then they are in the top 10 percent of South African earners;
- If an individual earns more than R15 000 per month, then they are in the top 3 percent of South Africans earners;
- If an individual earns R48 753 or more, then they fall into the 1 percent of "highest earners" in the country.

SALDRU's research also finds that 50% of South Africans are chronically poor (Business Tech 2019). Only 20% of South Africans belong to the stable middle class, while 4% belong to the

elite. The rest belongs to the transient poor (11%) and the vulnerable middle class (15%). The chronically poor and vulnerable poor are predominantly Black and to a lesser extent, Coloured. The top end of the distribution is disproportionately White.

Compounding the unemployment problem and poor prospects for economic growth, South Africa is also reported to have characteristically low levels of total entrepreneurial activity and a poor climate for innovation and small business development. According to the latest South African Global Entrepreneurship Monitor (GEM) report, only 10.1% of South Africans of working age intend to start their own business in the next three years, compared to 41.6% in the other African countries that were surveyed. The report also shows that the rate of “entrepreneurial intention” in South Africa has been declining over the past few years. In 2013 it stood at 15.4%, while in 2010, it was 19.6%. In 2015, the GEM found that 45.4% of working-age adults believed they had the knowledge and skill to start their own firms. In 2016, that fell to 37.9%.

## **2.5. 21<sup>st</sup> Century Learning and Entrepreneurship Education as Imperatives to Address the State of Education in South Africa**

It is important to state at the outset that the literature does not in any way suggest that 21<sup>st</sup> century learning and entrepreneurship education are the panacea to any country’s education and, by extension, socio-economic challenges. It is clear from the above discussion that South Africa’s challenges with education are myriad and complex. However, the increased emphasis on 21<sup>st</sup> century teaching and learning and entrepreneurship as keys to unlocking present and future growth cannot be ignored. Discussions and debates about what South African learners ought to learn, given the challenges we are facing, have been a priority within education circles, and have also extended well beyond them.

In their 2016 joint technical report, the National Education Collaboration Trust (NECT), Tshikululu Social Investments (Tshikululu), the FirstRand Empowerment Foundation (FREF) and the Global Education Leaders' Partnership (GLP), list five reasons why “educational transformation” is essential for South Africa to thrive in the 21<sup>st</sup> century. The report makes the following case for innovation in education in South Africa (van der Elst 2016, 16–17):

1. The education system is challenged by poor learning outcomes. (A 2015 OECD report ranks South Africa 75<sup>th</sup> out of 76 countries in terms of its standard of education. This is despite the fact that the country spends 20% of its budget—or 6.4% of its gross domestic product (GDP)—on education, an allocation considerably higher than in many other emerging market economies).
2. Compliance, conformity and complacency are valued above innovation. (In the majority of South African schools, the greatest proportion of teaching time is spent on managing learners through an industrial-era model with a standardized one-size-fits-all curriculum, which is disconnected from the more positive learning experiences learners have outside the classroom).
3. Youth have high expectations, yet we have high levels of unemployment. (Despite an increase in the number of young people with higher education qualifications, youth unemployment in South Africa remains high. In researching the link between education and employability in South Africa context, Kruss (2004) concluded that the tacit skills, knowledge and attitudes previously developed through work experience are now expected to be an integral part of education programmes and curricula, so as to provide “soft”, “transverse”, “life”, or “high” skills, and young South Africans do not have them).
4. South Africa's unique position in Africa holds special challenges and opportunities. (The dual nature of South Africa's economy—one strong and developed and one struggling and developing—arguably presents unique challenges and opportunities that demand unusual, disruptive responses).

5. Prioritizing 21<sup>st</sup> century innovation in education is in line with international best practice. (There is a global movement towards change in education and increased international recognition that innovation is critical for taking us forward in the 21<sup>st</sup> century and beyond). (van der Elst 2016, 16).

Supported by research conducted by Taylor (2011), the report goes on to highlight “fixing schools” as the single-most important imperative for the next two decades. This is based on the rationale that it is the inefficient schooling system that is responsible for producing “300 000 ineducable young adults annually”; that is responsible for low numbers of school leavers possessing an NSC of sufficient quality to enter critical fields, such as science and technology, and it is the schooling system which carries the largest responsibility for very low throughput rates in all the country’s colleges and universities (van der Elst 2016, 18).

On the side of entrepreneurship, South Africa’s poor economic prospects and rising unemployment have sustained arguments for the dire need for entrepreneurs who not only succeed, but who have the ability to positively impact and transform their communities (Allan Gray Orbis Foundation 2019). The importance of entrepreneurship to a country’s economic growth has been evoked widely around the world, and the discourse in South Africa has been no different. As the country’s rate of entrepreneurial activity has declined, poor education has been identified as one of the key contributing factors (Moodley 2016, 1). According to Moodley (2016), education has been found to be an important predictor of individuals who believe that their business will survive beyond start-up phase and increase the likelihood that the business will be opportunity-driven. As a determinant of entrepreneurial success, the role that education performs is therefore an important component of determining the entrepreneurial landscape of a country. In her study, Moodley found that informal education in particular has been a significant enabler of entrepreneurial activity in the South African context.

In their 2017 study, Gamede and Uleanya argue that South Africa needs an “economic science and entrepreneurship curriculum that is skills-based and career-orientated, as corporate industries need workers who are in possession of the appropriate entrepreneurship skills”

(Gamede and Uleanya 2017, 1–2). They further assert that the Further Education and Training (FET) phase in schools plays an important role in developing knowledgeable and skilled citizens, who are able to contribute effectively to the social and economic development of a country (Gamede and Uleanya 2017). It is therefore important to ensure that FET phase education relates to “real-world skills which are required by the public and private sectors” (Gamede and Uleanya 2017, 2). The authors’ intervention highlights the manner in which entrepreneurship is not seen as just important to drive business creation and success, but also as integral to developing learners who possess skills that are applicable in other contexts.

### 3. DEFINITION OF 21<sup>ST</sup> CENTURY SKILLS AND COMPETENCES: WHAT SHOULD WE LEARN?

Around the world, growing calls for new frameworks and approaches to teaching and learning are largely based on the assertion that education has failed to prepare learners for the demands of the 21st century (Kereluik et al. 2013, 128). According to Saavedra and Opfer (2012), the “outdated transmission model of education, through which teachers transmit factual knowledge to students via lectures and textbooks, remains the dominant approach to compulsory education in much of the world”. Through this model, students can learn information, but typically don’t have much practice applying the knowledge to new contexts, communicating it in complex ways, using it to solve problems, or using it as a platform to develop creativity (Saavedra and Opfer 2012, 9). The traditional model of education emphasizes routine, rule-based knowledge and is based on the assumption that memorizing information and regurgitating it represents knowledge acquisition, which can then be deposited, stored and used at a later date (Hooks 1994, 5; OECD 2012, 34).

Education literature has long recognized that this traditional model of education is ill-suited for our current context. Furthermore, as indicated in Chapter 2, 21st century learning and entrepreneurship education have become the leading imperatives in the discourse about education reform, and their implementation is intended to move us away from traditional approaches. However, despite this, national education systems have proven stubborn and slow to adapt to change. In the South African context, although a series of curriculum reforms have been implemented in an attempt to shift the education status quo and respond to the demands of the 21st century; there remains a huge gap between what is intended by education policy makers, scholars and practitioners; what is actually learned in South African classrooms and learner outcomes.

It is worth noting at this stage that this gap between what curriculum reformers intend and what actually happens in learning environments is not unique to South Africa. In fact, in order



to better understand some of the challenges that different countries face with integrating 21CC into national curricula, many scholars and policymakers make the distinction between the intended, implemented and attained curriculum (Voogt and Roblin 2012, 301). The argument made is that, although countries may recognize the need for 21st century education approaches and make the necessary shifts in policy and law, these may not necessarily translate into school and classroom contexts and lead to tangible outcomes. Voogt and Roblin (2012) say the following in relation to the gaps between the intended, implemented and attained curriculum:

The 21st century competencies needed in the knowledge society can be regarded as the overall rationale and goals for learning—i.e. the intended curriculum. However, there may be a gap between the needs of the knowledge society expressed by the advocates of 21st century competences and the ways in which these competences are addressed in national and school curricula— i.e. the implemented curriculum. Finally, appropriate assessment practices need to be in place to be able to determine whether expected learning outcomes are achieved—i.e. the attained curriculum.

The implication then is that it is important to clearly distinguish between these three aspects of education delivery, so that the education problem in the 21st century context, and the solution space, are more clearly defined. Put differently, the distinction between the intended, implemented and attained curriculum highlights the fact that when states think about integrating 21CC into their curricula, they ought to be thinking at three levels, namely: at the level of curriculum policy and statements; at the level of pedagogy and at the level of assessment. Bearing in mind the distinction between these three, this chapter discusses what 21CC are; what the dominant frameworks and approaches are (i.e. the overall rationale and goals for learning) and how this applies to the South African context. Curriculum implementation/pedagogy and assessment are discussed in Chapters 4 and 5.

### **3.1. The Learning Agenda for the 21<sup>st</sup> Century**

It is clear in the literature that the 21<sup>st</sup> century learner requires more than rote learning and memorization of routine knowledge in order to be able to grapple with the ambiguities and

contradictions of a world that is constantly and rapidly changing. The OECD summarizes the predominant views about the characteristics of learning in the 21<sup>st</sup> century by saying that, it is about “curiosity and self-direction, managing non-linear information structures, building one’s own mental representation of and synthesis of information, (finding) one’s own way through hypertext on the internet...and developing healthy skepticism, an inquiring mindset and interpreting and resolving conflicting pieces of information” (OECD 2012, 34). In today’s world, individuals create value by synthesizing disparate bits of information and making connections between ideas that previously seemed unrelated. The world is also no longer divided into specialists and generalists, but requires being familiar with and receptive to knowledge in different fields (OECD 2012, 34). The knowledge worker is therefore versatile and able to apply depth of skill to a progressively widening scope of situations and experiences, whilst gaining new competencies, building new relationships and assuming new roles (OECD 2012, 34).

The nature of what is required of the 21st century learner and knowledge worker today, combined with a lack of confidence that current education systems are not preparing learners to meet present and future realities, has led to countries now being more explicit about “new learning domains” and including them as specific goals of the education experience (Care et al. 2018, 8). These new learning domains have been referred to as “21st century competencies/skills/values/attitudes/ethics”; “soft skills”; “life skills”; “social-emotional skills”; “intra-personal and inter-personal skills”; “global competences” etc. depending on the context and jurisdiction. In addition, several international organizations and individual scholars have developed various frameworks, which provide different descriptions and accompanying specifications of what these new learning domains entail (Voogt and Roblin 2012, 301).

The term “21st century skills” is the most popular and has typically been open to some interpretation, again in different contexts and jurisdictions. However, it is generally considered to denote a combination of skills that are important in a modern society and workforce (Care et al. 2018, 8). The terms “transferable” or “transversal” competencies has also been used and

encompass some of the same skills that can be applied across multiple situations, in contrast to technical vocational skills, which are specific to particular occupations (Care et al. 2018, 8). In some regions and frameworks, the term also refers to a combination of interpersonal and intrapersonal skills, which may include emotional characteristics, attitudes, and values. In this paper, we are concerned with the “learnable and teachable competencies” that have been identified by countries; international organizations and education scholars and practitioners around the world, as central to the aspirations of building relevant and responsive schooling systems.

Although there is a diverse range of competencies that have been identified in the literature, 21st century competencies generally include skills such as critical thinking, collaboration, communication, problem solving, and digital literacy. For convenience, throughout this paper, we refer to these transferable or generalizable skills as 21CC. There are many reports and research papers that discuss the difficulties in terminology, labeling, and frameworks and structures of 21CC. Although this paper will touch on some of these difficulties, its aim is not to make a choice about what specific knowledge, skills, attitudes, values, and character should be sought. It similarly does not engage in the evaluation of the adequacy of particular frameworks and structures.<sup>3</sup> This paper is focused on identifying the competencies that are most frequently cited in the literature as important to modern society and labour, and then uses these to determine the implications for curriculum, pedagogy and assessment in the South African context.

### **3.2. Dominant 21CC. Frameworks and Approaches**

This subsection synthesizes the literature on 21st century and entrepreneurship education, in an effort to map the different frameworks and approaches to 21CC, tracing the commonalities between dominant approaches in order to understand the claims that are made about what

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<sup>3</sup> For review of frameworks, see Dede (2010) and current work being undertaken at Harvard [<https://easel.gse.harvard.edu/taxonomy-project>].

competences are integral to 21st century learning. Since a lot of work has already been done to summarize and understand different frameworks and approaches, our discussion relies mainly on secondary sources.

### 3.2.1. Country Approaches

A large-scale study, which maps countries' expressions of aspirations to equip students with 21CC was conducted by the Optimizing Assessment for All (OAA) initiative between the years 2016 and 2018. The study found that there has been a significant shift in countries' explicit identification of 21CC as part of their national education agendas and priorities (Care, Griffin, and Wilson 2018). However, the degree to which these expressions have translated into implementation varies across countries. In the study, the extent to which countries have moved toward implementation of 21CC curricula was explored through several indicators, namely:

- Whether a country identified specific 21CC in their education mission, vision statements, or associated policy documents, such as national education plans (which indicates a country's social and economic goals or values);
- Whether a country identified specific 21CC within the curriculum (which indicates what competences governments value); and
- Whether a country described how 21CC develop and progress over time from basic to more complex forms and through the different education levels (which suggests an intention to develop and teach these skills) (Care et al. 2018, 8).

Figure I shows that of the 152 countries for which data was collected:

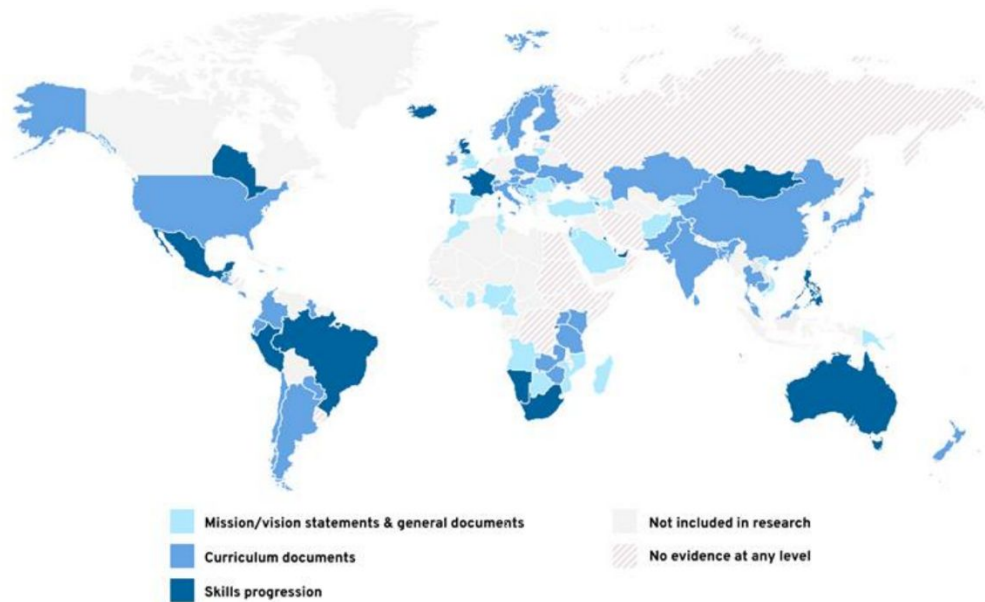
53 (35 percent) countries—including Spain, Morocco, Madagascar, and Dominican Republic—identified specific skills in their mission or vision statements and/or general policy documents but not in their curricula (although in some countries, curricula were unavailable online). Fifty-eight (38 percent) countries—including Chile, Norway, India, New Zealand, and Zambia—have specific skills embedded within their curricular documents, but do not show evidence of progressions of skills. Only 17 (11 percent)

countries—including Australia, Mexico, Singapore, Iceland, and United Arab Emirates—provide descriptions of how skills develop and progress over time, and across different educational levels. In 25 (16 percent) countries—including Iran, Russia, Democratic Republic of Congo, and Egypt—there was no evidence of the presence of any of the three indicators described above (Care et al. 2018, 8).

The four most frequently identified competencies within national policy documents across the 152 countries were **communication, creativity, critical thinking, and problem solving**. Other skills identified include **information technology, social, and entrepreneurship skills** (Care et al. 2018, 9). The data indicates that countries are explicitly identifying a wide range of 21CC as integral to their curricula, moving beyond the primacy of academic knowledge (Care et al. 2018, 9).

It is worth noting that the above study only focused on publicly available information, which is a limitation because countries may have national policy documents that identify 21CC, but do not make these available online to the public (e.g., national curriculum may not be online), and/or the information available online may not be up to date (Care et al. 2018, 9). Nevertheless, what the study shows is that countries around the world are moving toward an explicit focus on equipping learners with a broad range of competences for the 21<sup>st</sup> century.

FIGURE 1: EXPLICIT IDENTIFICATION OF SKILLS IN NATIONAL DOCUMENTS ACROSS 152 COUNTRIES



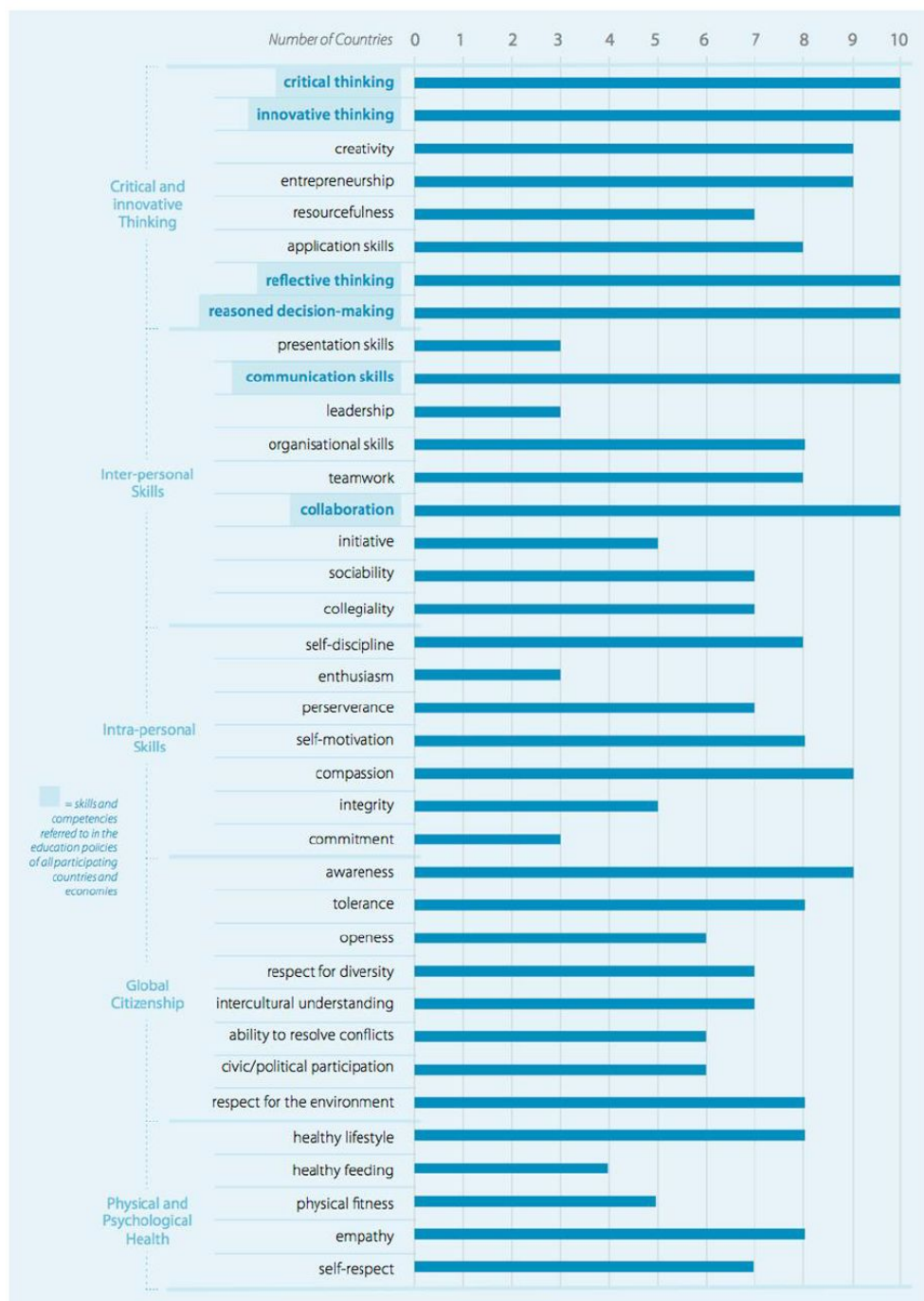
Source: (Care et al. 2018, 9)

To further portray this shift in country policy and awareness around 21CC, Care et al. (2018) discuss another set of studies conducted by the Asia-Pacific Education Research Network (ERI-Net) and UNESCO, which focused on shifts towards competency-based approaches at a regional level. In the three studies, the ERI-Net set out to explore the uptake of “transversal competencies” by national education systems in the Asia-Pacific region (Care et al. 2018, 10). The ERI-Net drew on a group of 10 – 11 country cases, varying the group of countries slightly across the three studies. Participating countries included Australia, China (Shanghai; Beijing), Hong Kong SAR, India, Japan, Republic of Korea, Malaysia, Mongolia, Thailand, Viet Nam, and the Philippines. The three ERI-NET studies were then followed by two additional UNESCO studies implemented through the Network on Education Quality Monitoring in the Asia-Pacific (NEQMAP) (Care et al. 2018, 10). These explored the assessment of transversal competencies and drew on the three previously ERI-Net studies, as well as Cambodia, Nepal, and Pakistan.

Figure 2 below captures the transversal competencies (or 21CC) that participating countries indicated they value. Notably, none of the countries in these studies mentioned acquisition of knowledge and “cognitive skills” as the primary goals of education. The most cited 21CC were

**critical, innovative, and reflective thinking; reasoned decision-making; communication; and collaboration** (Figure 2). However, there were additional competencies that were unique to specific countries and which tended to be more strongly associated with attitudes, values, and ethics (Care et al. 2018, 10).

FIGURE 2: NUMBER OF COUNTRIES AND ECONOMIES BY SKILLS AND COMPETENCIES



Source: (Care et al. 2018, 11).



Based on the most commonly cited competences, the ERI-Net then developed a framework to group and define the competencies that were most valued by countries participating in the study (Table 1).

TABLE 1: ERI-NETWORK DEFINITION OF TRANSVERSAL COMPETENCIES (21CC)

Learning Domains	Examples of key skills, competences, values and attitudes
<b>Critical and innovative thinking</b>	Creativity, entrepreneurship, resourcefulness, application skills, reflective thinking, reasoned decision-making
<b>Interpersonal skills</b>	Communication skills, organizational skills, teamwork, collaboration, sociability, collegiality, empathy, compassion
<b>Intrapersonal skills</b>	Self-discipline, ability to learn independently, flexibility and adaptability, self-awareness, perseverance, self-motivation, compassion, integrity, self-respect
<b>Global citizenship</b>	Awareness, tolerance, openness, responsibility, respect for diversity, ethical understanding, intercultural understanding, democratic participation, conflict resolution, respect for the environment, national identity, sense of belonging
<b>Media and information literacy</b>	Ability to obtain and analyse information through ICTs, ability to critically evaluate information and media content, ethical use of ICTs
<b>Others (e.g., physical health, religions)</b>	Appreciation of healthy lifestyle, respect for religious values

Source: (Care et al. 2018, 12)

The above global and regional studies show that, although different countries may value and emphasize different 21CC, and may classify and categorize them in different ways, there are competences that are commonly recognized as integral to a 21<sup>st</sup> century curriculum across different countries.

### 3.2.2. International Organizations and Scholar Approaches

As countries have shifted towards a common understanding that national education systems need to become “21<sup>st</sup> century ready”, so have different international organizations, multilateral agencies, global education communities and individual scholars—who have joined the clarion call for the integration of competency-based approaches in national education curricula. Similar to country and regional approaches, there has also been some diversity in expression and emphasis among them about what constitutes 21CC and what a 21st century education looks like in practice. However, there now appears to be some convergence between these different actors about what these competences are, as well as the enabling pedagogical approaches that are likely to foster them (Voogt and Roblin 2012, 301; Tan et al. 2017, 425).

Table 2 below captures some of the dominant international frameworks that have been developed by education and economic organizations, and the manner in which they have grouped and prioritized different 21CC. These organizations include the Partnership for 21<sup>st</sup> Century Skills (P21); the National Academy of Sciences’ Education for Life and Work; the Assessment and Teaching of 21<sup>st</sup> Century Skills (ACT21S); the OECD and the World Economic Forum (WEF).

Similar to the national and regional frameworks discussed above, **critical thinking, problem solving, creativity, collaboration** and **communication** feature prominently in the international frameworks depicted in the table. Socio-emotional and lifelong learning aptitudes, such as **positive self-concept, adaptivity** and **resilience** are also expressed in different ways by the different organizations.

The fact that there are commonalities between national, regional and international frameworks with respect to what competencies should be developed through education shows that there is a convergence towards integrating 21CC. However, the manner in which these frameworks emphasize, prioritize, categorize and classify competences differently means that there is not yet a common language to define them. Important concepts, such as knowledge, competencies, skills and abilities are also contested. What denotes knowledge? How is this different from a competence, a skill or an ability? These are questions that do not have clear-cut answers in the

literature, which has an impact on how 2ICC are understood, supported and sustained within national education systems.

Partnership for 21 <sup>st</sup> Century Skills	National Academy of Sciences' Education for Life and Work: Developing Transferable 21 <sup>st</sup> Century Knowledge and Skills	Assessment and Teaching of 21 <sup>st</sup> Century Skills (ACT21S)	OECD Definition and Selection of Competencies (DESeCo)	
<b>Learning and Innovation Skills</b> <ul style="list-style-type: none"> <li>• Creativity and Innovation</li> <li>• Critical thinking and Problem Solving</li> </ul>	<b>Cognitive Competences</b> <ul style="list-style-type: none"> <li>• Cognitive Processes and Strategies</li> <li>• Knowledge</li> <li>• Creativity</li> </ul>	<b>Ways of Thinking</b> <ul style="list-style-type: none"> <li>• Creativity and Innovation</li> <li>• Critical Thinking, Problem-Solving and Decision-Making</li> <li>• Learning to Learn, Meta-Cognition</li> </ul>	<b>Using Tools Interactively</b> <ul style="list-style-type: none"> <li>• Use language, symbols and texts interactively</li> <li>• Use knowledge and information interactively</li> </ul>	<b>Foundational Skills</b> <ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>
<b>Information, Media and Technology Skills</b> <ul style="list-style-type: none"> <li>• Information Literacy</li> <li>• Media Literacy</li> <li>• ICT Literacy</li> </ul>	<b>Inter-personal competencies</b> <ul style="list-style-type: none"> <li>• Teamwork</li> <li>• Leadership</li> </ul>	<b>Tools for Working</b> <ul style="list-style-type: none"> <li>• Information Literacy</li> <li>• ICT Literacy</li> </ul>	<b>Interacting in Heterogeneous Groups</b> <ul style="list-style-type: none"> <li>• Relate well with others</li> <li>• Cooperate, work in teams</li> <li>• Manage and resolve conflicts</li> </ul>	<b>Competencies</b> <ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>
<b>Learning and Innovation Skills</b> <ul style="list-style-type: none"> <li>• Communication</li> <li>• Collaboration</li> </ul>	<b>Intra-personal competencies</b> <ul style="list-style-type: none"> <li>• Intellectual Openness</li> <li>• Work Ethic, Conscientiousness</li> <li>• Positive Core Self-Evaluation</li> </ul>	<b>Ways of Working</b> <ul style="list-style-type: none"> <li>• Communication</li> <li>• Collaboration, Teamwork</li> </ul>	<b>Acting Autonomously</b> <ul style="list-style-type: none"> <li>• Act within big picture</li> <li>• Form and conduct life plans and personal projects</li> <li>• Defend and assert rights interests, limits and needs</li> </ul>	<b>Characteristics</b> <ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>
<b>Life and Career Skills</b> <ul style="list-style-type: none"> <li>• Flexibility, Adaptability</li> <li>• Initiative, Self-Direction</li> <li>• Social, Cross-Cultural Skills</li> <li>• Productivity, Accountability</li> <li>• Leadership, Responsibility</li> </ul>		<b>Living in the World</b> <ul style="list-style-type: none"> <li>• Citizenship (local and global)</li> <li>• Life and Career Skills</li> <li>• Personal and Social Responsibility (including social awareness and competence)</li> </ul>		

TABLE 2: OVERVIEW OF INTERNATIONAL 21CC EDUCATION FRAMEWORKS

Sources: (Tan et al. 2017; Soffel 2016)

In an effort to grapple with this challenge, different scholars have engaged in studies to examine prominent 21CC frameworks and approaches and, based on these, developed their own frameworks to address some of the problems with definition, categorization and classification of these competencies. There are many studies that do this work, but we focus on the work of Voogt and Roblin (Voogt and Roblin 2012) and Kereluik et al. (Kereluik et al. 2013) as points of entry.

Voogt and Roblin’s study examines the frameworks of 8 organizations in an effort to gain better insight into the similarities and differences between international 21CC frameworks (“horizontal consistency”) and the coherence between intentions, implementation and assessment of outcomes (“vertical consistency”). The 8 frameworks include those developed by the P21, ATCS and OECD (which are captured in Table 2 above) and 5 others. Similar to the studies discussed previously, the authors found that there were strong agreements on the need for competencies in the areas of **communication, collaboration, ICT-related competencies** and/or **cultural awareness** (Table 3). **Creativity, critical thinking, problem-solving** and the **capacity to develop relevant and high-quality products** were also found to be highly regarded 21CC by most of the frameworks. The main differences found in the frameworks were in relation to competencies that are related to core subjects and especially whether or not to consider them, or the core curriculum, when defining 21CC.

TABLE 3: SUMMARY OF 21CC FOUND IN GLOBAL FRAMEWORKS

Mentioned in <i>all</i> frameworks	Mentioned in <i>most</i> frameworks	Mentioned in a <i>few</i> frameworks	Mentioned in <i>only one</i> framework
<ul style="list-style-type: none"> <li>• Collaboration</li> </ul>	<ul style="list-style-type: none"> <li>• Creativity</li> </ul>	<ul style="list-style-type: none"> <li>• Learning to learn</li> </ul>	<ul style="list-style-type: none"> <li>• Risk-taking,</li> </ul>
<ul style="list-style-type: none"> <li>• Communication</li> </ul>	<ul style="list-style-type: none"> <li>• Critical thinking</li> </ul>	<ul style="list-style-type: none"> <li>• Self-direction</li> </ul>	<ul style="list-style-type: none"> <li>• Manage and solve conflicts</li> </ul>
<ul style="list-style-type: none"> <li>• ICT literacy</li> </ul>	<ul style="list-style-type: none"> <li>• Problem-solving</li> </ul>	<ul style="list-style-type: none"> <li>• Planning</li> </ul>	<ul style="list-style-type: none"> <li>• Sense of initiative and entrepreneurship</li> </ul>

- Social and/or cultural skills, citizenship
- Develop quality products/productivity
- Flexibility and adaptability
- Interdisciplinary themes
- Mathematics, communication in mother tongue, science
- Core subjects: economics, geography, government and civics
- History

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Source: (Voogt and Roblin 2012, 309)

Voogt and Roblin (2012) also dedicate considerable discussion to ICT, which lies at the core of all 21CC frameworks. They point out that:

the development of ICT is not only regarded as an argument for the need of new competences by all frameworks, but it is also associated to a whole new set of competences about how to effectively use, manage, evaluate, and produce information across different types of media. While some frameworks emphasize ICT-related competences as separate learning domains, others call attention to more integrative approaches where the development of ICT skills is embedded within other 21st century competences, such as critical thinking, problem-solving, communication, and collaboration ((Voogt and Roblin 2012, 309).

The authors then provide useful definitions for what is meant by ICT-related competencies, according to the different frameworks. They highlight that, when defining ICT-related competences, most frameworks refer to three types of literacies: information literacy, technological literacy and ICT literacy. These are summarized in Table 4 below.

TABLE 4: DEFINITIONS OF ICT-RELATED COMPETENCIES

ICT-Related Competence	Description
<b>Information literacy</b>	The capacity to access information efficiently and effectively; to evaluate information critically and competently and to use information accurately and creatively ( <i>American Association of School Librarians and Association for Educational Communications and Technology 1998</i> ).

<b>Technological Literacy</b>	The capacity to use, understand, and evaluate technology, as well as to understand the technological principles and strategies needed to develop solutions and achieve goals ( <i>U.S. Department of Education 2010</i> ).
<b>ICT Literacy</b>	ICT literacy in its traditional form refers to the technical skills related to the use of technology ( <i>Anderson 2001</i> ). However, this term can also be conceptualized in a much broader way as the use of digital technology, communication tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society ( <i>Committee on Technological Literacy 2002</i> ).

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Source: (Voogt and Roblin 2012, 309)

The main difference between ICT literacy and technological literacy lies in the different emphasis they place on the competences needed to function in a knowledge society (Voogt and Roblin 2012, 308). Technological literacy emphasizes the inter-play between technology and society and the importance of understanding the technological principles needed to solve complex problems and face the challenges of a knowledge society. Conversely, ICT literacy focuses mainly on how to make effective and efficient use of digital technologies.

Kereluik et al. (2013) go a step further in their analysis of global 21CC frameworks by not merely describing what is common and uncommon amongst them and attempting to provide some definitions, but they also use what has emerged from the literature to develop a new 21CC model, which seeks to codify what is meant by these competences in an integrated and comprehensive way. Kereluik et al. follow a rigorous methodology, which involves coding the different elements of 15 different global prominent frameworks and analyzing relevant documents to recognize patterns and themes in the data. Their model is intended to synthesize and capture the essence of all the frameworks they considered in a manner that is able to guide the implementation of 21CC curricula.

The authors identify three broad categories of competences, with three subcategories within each of them (Table 5). The three broad categories are **Foundational Knowledge**, which

speaks to what learners need to know; **Meta Knowledge**, which is the knowledge that learners should rely on to act, and **Humanistic Knowledge**, which encapsulates the values learners should bring to their actions. The three categories within each of these are summarized and defined in the Table 5 below.

It is noteworthy that Kereluik et al. (2013) include core content knowledge as part of their model, particularly as the national and regional frameworks, as well as Voogt's and Roblin's (2012) analysis (see Table 3 above), seem to imply that core subjects are often neglected in 21CC frameworks, as these frameworks focus on new ways of knowing and learning and pay little attention to traditional learning domains. Kereluik et al. however contend that traditional academic domains are the building blocks upon which 21CC competencies are developed (Kereluik et al. 2013, 130). According to the authors, excellence in these domains requires disciplined ways of thinking characterized by highly complex and deeply ingrained mental processes e.g. applying mathematical principles to solve everyday problems or applying scientific ways of thinking to understand the natural world.



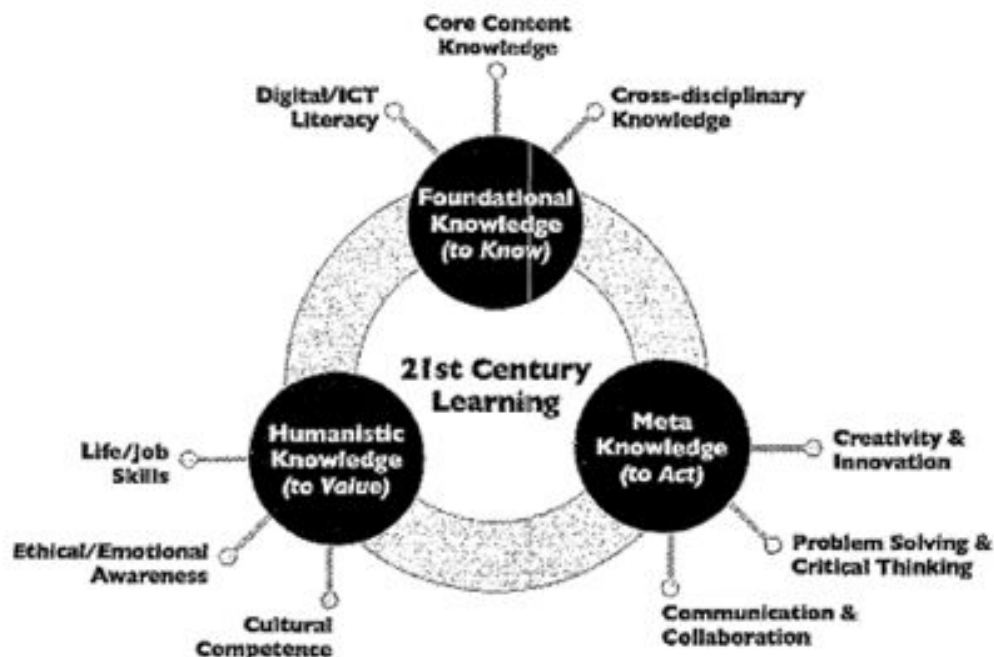
TABLE 5: SUMMARY OF KERELUIK ET AL. MODEL OF 21CC

<b>Foundational Knowledge (to Know)</b> <i>This category responds to the question: what do learners need to know?</i>	<b>Meta Knowledge (to Act)</b> <i>This category is about the knowledge process of working with foundational knowledge</i>	<b>Humanistic Knowledge (to Be)</b> <i>This form of knowledge offers a perspective on self and its location in a broader social context.</i>
<b>1. Core Content Knowledge</b>  Refers to traditional academic domains e.g. English and Mathematics. Excellence in these is the foundation upon which 21CC are developed.	<b>1. Problem Solving and Critical Thinking</b>  Critical thinking involves the ability to interpret information and make informed decisions based on such information. Problem solving is the use of critical thinking skills toward the effective resolution of a specific problem or toward a specific end goal.	<b>1. Life Skills, Job Skills and Learning Skills</b>  Life skills, job skills, and learning skills are essential for the development of personal and professional competence. These skills enable learners to create lifelong learners who can thrive in a rapidly changing world beyond the confines of the classroom.
<b>2. Digital Information Literacy</b>  Can be defined as the ability to effectively and thoughtfully evaluate, navigate, and construct information using a range of digital technologies to function fluently in a digital world. An important part of this is the ability to effectively seek out, organize, and process information from a variety of media.	<b>2. Communication and Collaboration</b>  Communication involves the ability to clearly articulate oneself through all communication media (oral, written, nonverbal and digital), as well as the skills necessary to be an active and respectful listener to diverse audiences. Collaboration includes similar dimensions as communication, but also includes important individual contributions, such as flexibility, willingness to participate and recognition of group and individual efforts and success.	<b>3. Cultural Competence</b>  Cultural competence also includes the ability to understand, appreciate, and interact with people from cultures or backgrounds that differ from one's own. It includes personal, interpersonal, and organizational competence evidenced through effective communication, collaboration, and the ability to understand and respect the ideas and emotions of all.
<b>3. Cross-Disciplinary Knowledge</b>  Knowledge that integrates and synthesizes information from across fields or domains, such as the application of knowledge to new contexts in the pursuit of specific end goals.	<b>3. Creativity and Innovation</b>  Creativity and innovation involve applying a wide range of knowledge and skills to the generation of novel and worthwhile products (tangible or intangible), as well as the ability to evaluate, elaborate, and refine ideas and products.	<b>3. Ethical Awareness</b>  Ethical awareness includes the ability to understand and apply ethical principles necessary for success in a globalized world. It includes the ability to imagine and understand others' position and feel with them (empathy), as well as the ability to make ethical decisions.

According to the authors, traditional learning domains, therefore, remain important to 21<sup>st</sup> century learning; however, modes of enquiry ought to shift to accommodate new ways of thinking and acting (Kereluik et al. 2013, 133).

It is also worth expanding on the authors' conception of life skills, job skills and leadership as a component of Humanistic Knowledge. Here, the authors refer to the ability to regulate one's efforts to meet particular ends. In our globalized, digital and interconnected world, self-regulation necessitates the organization of the demands of different aspects of our lives, including the personal and professional, in ways that lead to individual success and also promote the common good. Self-regulation is identified as critical for learners, as the 21<sup>st</sup> century requires them to be able to organize relevant and particular information and then respond appropriately to solve problems. Job and life skills interact with cultural competence and ethical awareness as requirements for social and economic success in the 21<sup>st</sup> century. Our interconnected world requires us to communicate with diverse groups of people across the world and it has become increasingly important to be driven by a value system which respects difference and maintains a core of empathy and understanding.

FIGURE 3: A VISUAL DEPICTION OF THE THREE-CATEGORY 21CC MODEL



Source: (Kereluik et al. 2013, 130)

The visual depiction of the three-category model developed by Kereluik et al. in Figure 3 above shows that the dimensions of the model do not function as discrete categories—there are overlaps and demarcations are not clear-cut, as different dimensions are always supporting and informing each other. The model’s contribution to the discussion is that it provides a “big picture view” of what we mean by 21CC and the authors’ analysis provides a clearer vision of a field that has been dominated by multiple, and at times seemingly conflicting, perspectives.

### 3.3. Entrepreneurship and 21CC

Alongside the growing body of literature about 21<sup>st</sup> century teaching and learning, another body of literature, which investigates the role of entrepreneurship in the 21<sup>st</sup> century economy has also been pre-occupied with what competencies are required for successful entrepreneurial activity. As already indicated in Chapter 2, entrepreneurship is recognized as a key driver for economic development, in both developed and developing contexts. According to Seth (2019), entrepreneurship is important as it has the ability to improve standards of living and create

wealth, not only for the entrepreneurs, but also for related businesses. Entrepreneurs also help drive change with innovation, where new and improved products enable new markets to be developed (Seth 2019). Entrepreneurial activity can also help boost national income and tax revenue as a result of higher earnings. Entrepreneurs have also been thought of as national assets to be cultivated and motivated as creators of social change, through their investment in the development of communities. In the South African context, job creation is one of the major areas that entrepreneurship has been intended to have the most impact, given the country's very high rates of unemployment (Allan Gray Orbis Foundation 2019).

It is for these above reasons that researchers have been pre-occupied with the question of how to use education to develop entrepreneurial competencies, in order to drive positive social and economic outcomes, which has resulted in a rich and diverse body of literature on entrepreneurship education. While much of the 2ICC literature is focused on basic education, a considerable body of literature on entrepreneurship education is higher-education focused.

Research investigating entrepreneurial competencies has shown that there is a meaningful overlap between 2ICC and entrepreneurial competencies (Boyles 2012, 42). Similar to the research on 2ICC, scholars in the field of entrepreneurship education have produced a number of theoretically and empirically supported concepts, including: human capital (Gimeno, Folta, Cooper, & Woo 1997; Shane 2000), social capital and social skills (Aldrich & Zimmer 1986; Baron & Markman 2000; Burt 1992), self-efficacy (Boyd & Vozikis 1994; Chen et al. 1998; Markman et al. 2002; Scherer et al. 1989), and creativity (Gilad, 1984; Timmons 1978; Ward 2004; Whiting, 1988), which have been proven to have a demonstrated relationship to entrepreneurial activity. Generally speaking, stronger competencies in these areas increase the likelihood of engaging in entrepreneurial activity and/or entrepreneurial success (Boyles 2012, 44).

Based on her study of the relevant literature, Boyles (2012) groups entrepreneurial competencies into three major categories, namely: **cognitive**; **social** and **action-oriented**. Through an in-depth analysis of these three categories, she reveals a pattern, which

demonstrates significant and relevant connections to 21CC. A summary of these three categories, along with their connections to 21CC categories, are contained in Table 6 below.

The main take-away from Boyles' analysis is that, similar to 21CC, the cognitive, social and action-oriented competencies associated with entrepreneurship are teachable and learnable. Boyles' critique of the use of the number of graduates that start or intend to start businesses as a metric for success for entrepreneurship education programmes is also important. According to the author, research on venture establishment in the US consistently shows that businesses are started by individuals over the age of 35, while younger entrepreneurs (aged 18 – 24) make up about 3% of all entrepreneurs in the US (Boyles 2012, 49). Boyles therefore argues that the importance of prior industry experience to the success of entrepreneurial activity offers a viable explanation for this empirical reality, which means that entrepreneurship education programmes are better served by pursuing metrics that aim to develop successful knowledge workers at the first instance (Boyles 2012, 49). And, as the research suggests, the best way to develop workers who will thrive in the new knowledge economy is through the development of 21CC. In Boyles' conception, by arming learners with 21CC, we give them a much better chance to secure employment; garner specific and important industry knowledge and, ultimately, as a result of the congruencies between 21CC and entrepreneurial competencies, to become successful entrepreneurs. Although one may not entirely agree with Boyles reasoning here, her analysis highlights the linkages, and the need for alignment, between the goals and outcomes of 21<sup>st</sup> century and entrepreneurship education.

	Cognition	Social	Action-Oriented
<b>Description</b>	Relates to an entrepreneur's distinct ways of thinking, which increase their likelihood of identifying opportunities and developing new ventures to exploit those opportunities.	Relates to an entrepreneur's ability to generate important connections and networks, which impact the likelihood of success in entrepreneurial activity. These relationships form the basis of an entrepreneur's <i>social capital</i> .	Relates to an entrepreneur's ability to act in order to manage and monitor the business in order to maximize the likelihood of success.
<b>Key Characteristics</b>	<ul style="list-style-type: none"> <li>• Ability to process information integrative ways and reason logically and creatively to solve problems</li> <li>• Active search and entrepreneurial alertness: i.e. actively searching for new opportunities and being able to identify and appreciate them when they appear</li> <li>• Opportunity recognition and development</li> </ul>	<ul style="list-style-type: none"> <li>• Social skills, including the ability to accurately assess others, adapt to changing and different social situations, initially and consistently portray a good impression of self to others, and to successfully persuade others,</li> </ul>	<ul style="list-style-type: none"> <li>• Ability to act in order to manage and monitor the business in order to maximize the likelihood of success.</li> </ul>
<b>Connections to 21CC categories</b>	Information, media and technology literacy; critical thinking, problem-solving, and creativity (inventive thinking).	Communication and collaboration	Productivity and innovation

TABLE 6: ENTREPRENEURIAL COMPETENCIES AND THEIR LINKS TO 21CC CATEGORIES

Source: Adapted from (Boyles 2012)

### 3.4. Critiques of Competency Approaches

The convergence of countries, international organizations and global scholar or education communities on 21CC as integral to modern society and labour should not mask some of the critiques/controversies of 21CC frameworks and approaches. Several authors have made it a point to highlight that these competences on their own are not new (Voogt and Roblin 2012; Kereluik et al. 2013; van de Oudeweetering and Voogt 2017). For instance, competences such as problem-solving and critical thinking have been associated with academic achievement and as characteristic of a desirable education as early as the 1900s (Voogt and Roblin 2012, 316). However, it is the significance of learning them in an integrated way, their importance for all age levels and the implications of technological advancements to enable them, which makes their implementation in educational practice a complex curriculum innovation (Voogt and Roblin 2012, 316; van de Oudeweetering and Voogt 2017, 118).

There are other voices who have challenged the universality of 21CC. Some claim that, although the concept of competency is extremely valuable for guiding how teaching and learning should unfold in the classroom; it usually represents the voices of businesses and firms. According to this view, in many ways, the rhetoric of 21<sup>st</sup> CC is seen as yet another facet of an economist or instrumental approach to education, according to which the main goal is to prepare workers for knowledge-intensive economies or even in some cases for particular firms, as opposed to emphasizing the harmonious development of all human abilities. Voogt and Roblin (Voogt and Roblin 2012) are quite critical of the fact that the dominant global frameworks for 21CC do not contain meaningful contributions from the education sector, let alone schools and teachers.

Furthermore, some people argue that, as they are commonly defined, 21CC are not within reach of all young people, firstly because not all today's students are going to become knowledge-intensive workers, even in developed countries. Secondly, the rhetoric forgets the

needs of the vast majority of the world's population in developing countries. They argue therefore that the discourse on 21CC is hardly relevant in all contexts and there is a risk of enlarging socio-economic disparities when promoting such competencies among the world's elite.

A different perspective asserts that 21CC frameworks overemphasize skills at the expense of “core knowledge” or traditional subjects. Proponents of this particular argument say that although learning skills is very important, they cannot be learnt independently or outside of particular knowledge domains e.g. traditional academic subjects (Kereluik et al. 2013). They also claim that students will not be able to apply these skills if they lack the appropriate factual knowledge on a particular domain (Ananiadou and Claro 2009, 6).

### 3.5. Implications for Measurement

The South African context echoes the global state of play in that different actors continue to lament the fact that the education system is failing to prepare learners for the 21<sup>st</sup> century. Similar to the discourse on the current nature of education globally, 21<sup>st</sup> century teaching and learning and entrepreneurship education continue to be evoked as solutions to some of the challenges facing the education system in South Africa, as discussed in Chapter 2. Current efforts to align CAPS with 21<sup>st</sup> century education have highlighted the distinction between South Africa's intended, implemented and attained curriculum. It is commonly understood that the basic education curriculum *intends* to develop 21CC, or at least contains language that aligns with 21CC. An excerpt of the National Curriculum Statement (NCS) Grade R-12 is contained in Figure 4 below. The reader will note that one of the principles on which the NCS is based is that of **active and critical learning**, which means encouraging an active and critical approach to learning, rather than rote and uncritical learning of given truths. The learners that the NCS intends to develop also possess the hallmarks of 21CC competencies, including: **problem-solving using critical and creative thinking; working effectively and collaboratively in teams; self-organization and self-management**; the ability to collect,



analyze, organize and critically evaluate information **(information literacy)**; **effective communication**; an ability to **care for the environment and for others**, using science and technology, and the ability to **appreciate the world as a set of related or inter-connected systems**.

However, as indicated in the literature, an expression of the intent to develop 21CC does not necessarily translate into actual implementation. In his study investigating the teaching strategies for the implementation of South Africa's science curriculum, Msimanga (2013) observes that teaching and learning in South African classrooms "is largely teacher-centred, characterized by learner passivity and rote learning; teachers' questioning aims at data recall...with cursory reference to applications of science knowledge in societal and development issues".

FIGURE 4: EXCERPT FROM THE CURRICULUM AND ASSESSMENT POLICY STATEMENT

- (c) The National Curriculum Statement Grades R-12 is based on the following principles:
- Social transformation: ensuring that the educational imbalances of the past are redressed, and that equal educational opportunities are provided for all sections of the population;
  - Active and critical learning: encouraging an active and critical approach to learning, rather than rote and uncritical learning of given truths;
  - High knowledge and high skills: the minimum standards of knowledge and skills to be achieved at each grade are specified and set high, achievable standards in all subjects;
  - Progression: content and context of each grade shows progression from simple to complex;

- (d) The National Curriculum Statement Grades R-12 aims to produce learners that are able to:
- identify and solve problems and make decisions using critical and creative thinking;
  - work effectively as individuals and with others as members of a team;
  - organise and manage themselves and their activities responsibly and effectively;
  - collect, analyse, organise and critically evaluate information;
  - communicate effectively using visual, symbolic and/or language skills in various modes;
  - use science and technology effectively and critically showing responsibility towards the environment and the health of others; and
  - demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation.

Source: (Department of Basic Education 2011)

In a 2016 DBE Roundtable on Assessment, our Minister of Basic Education, Angie Motshekga, also cautioned against the inappropriate assessment practices that are rife in South Africa's basic education system. She advised that the education system should not be driven by assessments and examinations and that a more holistic assessment approach should be adopted. She further indicated that she viewed CAPS to be a foundational base for schools that should not simply be implemented slavishly without educator mediation.

The role of the teacher in delivering a 21<sup>st</sup> century education in the classroom then becomes significantly important and one of the central questions for measurement is around the mechanisms that teachers use and deploy in the classroom to deliver the *intended* curriculum in order to ensure that 21CC are developed, as well as the factors that hinder effective implementation of a 21CC-based curriculum.

The discussion in this chapter also shows that, as the future remains volatile and unpredictable, attempts to articulate the kinds of skills, competencies, and dispositions learners will need in the future are inevitably speculative (and context dependent). 21CC discourse remains at a nascent stage in most countries, despite attempts to concretize frameworks and describe

various innovative practices and policies. For purposes of measurement, there is a choice to be made about what 21CC are considered important for the South African context and which competences the E<sup>3</sup> programme will privilege to achieve its aims. In other words, for purposes of the baseline study, there is a choice to be made regarding the prioritization and definition of specific 21CC for measurement and room to be created for this prioritization and definition to be refined based on the context of South African classrooms.

Critiques of the 21CC discourse also show us that, as our understanding continues to develop, there is also a need to trouble the dominant discourses of 21CC. As previously indicated, frameworks, particularly those propagated worldwide by organizations such as the OECD, WEF, P21 etc. may perpetuate the language of competition and economic rationality, pushing for the alignment of curriculum around skills considered necessary for employment in the global marketplace (Tan et al. 2017, 433). Consequently, policymakers and educators may inadvertently be pressured to privilege the question of how to implement 21CC most effectively over more philosophical questions about why 21CC are valuable for a thriving life and citizenry. In this sense, the next stage of development of 21CC may need to lend greater attention to exploring the ethics and values informing 21CC schooling as well as articulate a clearer philosophy of education grounded on the vision of South Africa's constitutional democracy—a vision which identifies education as a key lever for achieving socio-economic justice.

More specifically, the challenge is how South Africa can develop its own brand of 21CC values and philosophy, not merely adapting frameworks and discourses propagated by scholars and organizations from the Global North, but one that is derived from the voices of its own scholars and educators and that takes into account its situatedness in a multicultural, African context. Tools for measurement therefore need to make an attempt to center educator voices, and other voices within the education system, to ensure continued development of approaches that fit our context.



## **4. METHODOLOGIES FOR 21<sup>ST</sup> CENTURY LEARNING: HOW SHOULD WE LEARN?**

The previous chapter highlights the fact that, a mere articulation of what 21CC competencies should be developed is not sufficient. Without teachers implementing effectively in the classroom, expressions of an intent to develop 21CC contained in curricula statements, education visions, missions etc. and efforts towards curriculum reform are all dead in the water. Teacher agency remains critical to the 21st century education project, as it enhances commitment to curricula reform goals and ensures the quality of education practice. The following section outlines some of the key features of the instructional methods or progressive methodologies that teachers are required to be conversant with in order to impart 2CC, based on the literature.

### **4.1. Constructivism and Progressive Education**

Constructivism is an epistemology, or a theory, used to explain how people know what they know. It places problem solving at the heart of learning, thinking, and development (State University n.d.). As people solve problems and discover the consequences of their actions—through reflecting on past and immediate experiences—they construct their own understanding. Learning is therefore an active process, which requires a change in the learner. This is achieved through the activities the learner engages in, including the consequences of those activities, as well as through reflection. According to constructivist theory, people only deeply understand what they have constructed.

Within the constructivist school of thought, John Dewey is widely recognized as having laid the philosophical foundations for what later became popularly known as the progressive movement in education, as early as the 1900s (New World Encyclopedia 2019). Dewey, and other thinkers

like him, including Jean Jacque Rousseau and Karl Marx agree that knowledge is not static, but that all reality or truth changes. Reality therefore varies from one perceiver to another and knowledge is dynamic. As such, by Dewey's conception, learners should be allowed to learn freely, beginning with their lived reality before proceeding to interact with content based on their experience. The emphasis of progressive approaches is therefore on **“learning by doing”**.

In the progressive classroom, learners actively participate in their own learning through encountering real life situations, in which they get first-hand information. This enhances learners' interaction, utilizing their curiosity to promote engagement. The teacher acts as mentor and creates an atmosphere for active participation by making provisions of real-life situations and providing the equipment, apparatus and resources for learners to learn on their own. The most important principle for progressives is that “a learner has to find knowledge using their own ways, under the teacher's guidance and knowledge”. The teacher is therefore not authoritarian in the classroom, using coercive methods and domination to rule the classroom environment. Instead, the teacher facilitates learning, guiding learners to discover new truths. Discovery/inquiry or problem-solving methods are said to be the brainchild of Dewey, who advocates that proper cognition comes through fusion of theory and practice known as “proxis”.

Progressive approaches to teaching and learning therefore differ from traditional approaches in that they are learner-centered, with the teacher contributing to learning more as a facilitator than an authoritative figure. Some of the differences between traditional and progressive approaches are summarized in Table 7 below.

TABLE 7: DIFFERENCES BETWEEN TRADITIONAL AND PROGRESSIVE APPROACHES

<b>Traditional</b>	<b>Progressive</b>
Teacher-centered	Learner-centered

Bigger class size	Smaller class size/groups
Isolated curriculum (subjects are taught separately)	Integrated curriculum (inter-disciplinary approaches to subjects)
Product-oriented	Process-oriented
Learning by repetition	Learning through various activities
Concepts are presented as facts to memorize	Concepts are presented as questions to be investigated
Basic learning	In-depth learning
Quantitative evaluation (numerical testing)	Authentic Assessment

Progressive education has evolved over the years and its principles and practices have continued to have an influence throughout the past century. This is evidenced in the language of progressive approaches continuing to be embedded in contemporary approaches. In 1996, Hirsch describes some of the contemporary teaching and learning terminology, stating:

The goal of present-day educational reformers is to produce students with “*higher-order skills*” who are able to think independently about the unfamiliar problems they will encounter in the information age, who have become “*problem solvers*” and have “*learned how to learn*,” and who are on their way to becoming “*critical thinkers*” and “*lifelong learners*” (The Institute of Progressive Education and Learning n.d.)

The method advocated by Hirsch for achieving these “higher-order skills” is called “discovery learning” (learning by doing), by which students solve problems and make decisions on their own through “inquiry” and “independent analysis” of “real-world” projects (The Institute of Progressive Education and Learning n.d.). The key tenets of progressive education therefore

bear a strong resemblance with 21<sup>st</sup> century education, whose learning methodologies can be traced back to their roots in the progressive movement

## 4.2. Progressive Learning Methodologies

There are various teaching and methodologies that have been developed to foster progressive learning environments. Similar to conceptions of 21CC, the language and expression of these methodologies differs across jurisdictions and frameworks. However, there are some core tenets which are common. According to Barnes (n.d.), the following are critical to the learner-centered classroom:

1. **Project-based learning:** Creating ongoing project plays an essential role in promoting mastery. The key to ongoing projects is to provide plenty of project choices that enable students to demonstrate what they are learning. Many objectives or standards can be met in one well-crafted project that allows learners to decide what the final product looks like. The ongoing project stimulates the workshop environment that is the foundation upon which the learner-centered classroom is built.
2. **Technology Integration:** In today's digital world, it doesn't matter if your classroom is filled with computers; students have them in the palms of their hands. Mobile learning is no longer the wave of the future; it's the present. Learners will be more engaged in any activity or project if they can choose from the hundreds of amazing, free web tools that provide excellent platforms for presenting, curating, and sharing information. When learners have an array of exciting web tools at their disposal, they become eager to participate in almost any class activity.
3. **Replacing homework with engaging in-class activities.** The research on the effectiveness of homework ends up on both the pro and con sides. Most studies that support assigning homework suggest that it increases grades in class or on tests. Whether this is true or not is irrelevant. Measuring achievement with grades and test scores is a false barometer of



learning because all the control in these areas is in the hands of the teacher, and there is no place for control in a learner-centered classroom. With engaging, ongoing projects that are driven by interactive web tools, learners produce more in class, making homework obsolete. Best of all, when not faced with “do-this-and-do-it-my-way” assignments, learners become eager to complete the projects that they have created and choose to do schoolwork outside of class. This autonomy breeds learning for the sake of learning—one of the best parts of the learner-centered classroom.

**4. Eliminating rules and consequences:** The workshop environment of a bustling learner-centered classroom encourages a pursuit of learning that allows little time for disruption. Set the tone from the first day of the school year by eliminating all discussion of rules and consequences. Explain that your learning environment is built on mutual respect and a quest for knowledge, so there won't be time for any behavior issues. Keep activities engaging, and behavior will never be an issue.

**5. Involving students in evaluation:** Numbers, percentages, and letters on activities, projects, and report cards say little about learning. A learner-centered environment thrives through the use of narrative feedback that follows a specific formula and encourages learners to resubmit assignments that do not demonstrate mastery. This approach relies on reciprocal feedback between the learner and the teacher. Involving learners in conversations about their learning not only builds trust, but also helps them become critics of their own work, which is a remarkable part of the amazing learner-centered classroom.

The above strategies do not represent an exhaustive. Other terms that encompass and describe progressive learning methodologies include inquiry, experimentation, field work, projects, discussion, demonstration, group work, role play, research, simulation, drama and debate.

### 4.3. Implications for Measurement

For the purposes of measurement, we attempt to match PLMs to the particular 21CC or skills they are intended to develop. We found some frameworks in the literature that attempt to draw these connections between teaching and learning methodologies and the development of particular competencies/skills. Figure 5 below is one such example from WEF, which shows that there are significant overlaps and a single strategy may develop multiple competencies/skills. Strategies such as play-based learning, developing a growth mindset, fostering reflective reasoning and analysis and hands-on approaches, amongst others, are seen as cross-cutting and developing “all skills”; whilst other strategies are seen as more suited to developing particular competencies and character qualities.

FIGURE 5: 21CC AND THE LEARNING APPROACHES THAT FOSTER THEM



## 5. IMPLICATIONS FOR TEACHERS AND TEACHER EDUCATORS

Having considered the philosophical underpinnings of the progressive movement in education and the core tenets of progressive learning methodologies (PLMs), this section discusses the implications that PLMs have for teachers and how they should be trained in order to best implement these methodologies.

### 5.1. Integrated, interdisciplinary, and inquiry-based learning

#### 5.1. Integrated learning

Obanya (2010) uses Nigeria's National Teacher Education Policy (NTEP, 2009) to interpret the meaning of integration in the educational context. One of eight key principles of the NTEP is that teachers should have an appropriate mastery of subject content and subject-specific methods of teaching. Without mastery of either of these two aspects of teaching, the result is what Webber and Miller (2016) refer to as the “transfer problem”. This is where the transfer of knowledge between teacher and learner is hindered because the teacher either lacks subject knowledge, pedagogical knowledge, or both. Currently, it is teaching methodology which is the weakest link in most education systems (Webber & Miller, 2016).

In the discussion of their findings, Vavrus, Thomas, and Bartlett (2011) suggest that there is often a disconnect between content and pedagogy in African education systems. These systems fail to produce teachers who possess pedagogical content knowledge (PCK). This is crucial in being able to adapt conceptual and theoretical knowledge about subject matter into a language – using appropriate examples and metaphors – which will facilitate examples and applications for learning for particular learners.

Obanya (2010) explores five levels of teaching – which are illustrated in the figure below. A dictatorial convention of teaching is the first level of teaching. On the other end of the

spectrum at level five, teachers use creative methodologies to teach. Obanya (2010) defines the five levels of teaching in the following manner:

### **1. Dictatorial**

Teachers are seen as all-knowing and are filling students' 'empty' heads with knowledge

### **2. Didactic**

Teacher has learnt formal pedagogy and blindly follows them

### **3. Demonstrative**

Teacher only allows student input in the 'say/do after me' approach

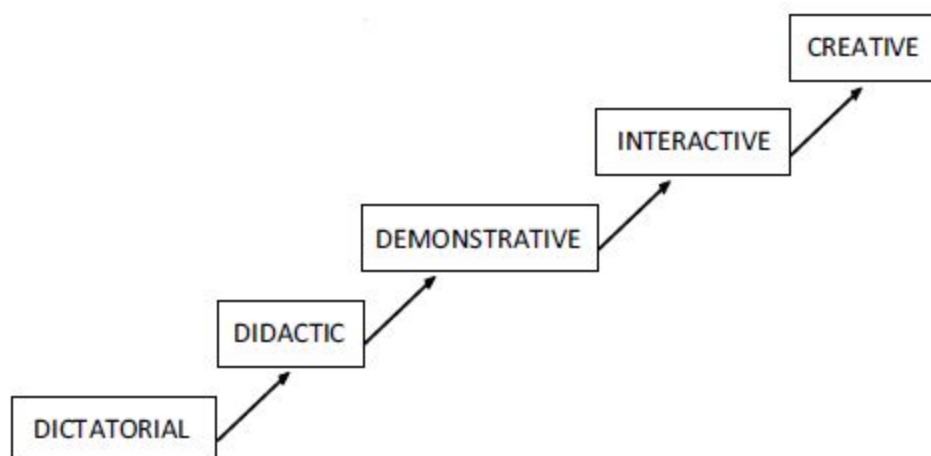
### **4. Interactive**

Teacher encourages student participation, although it is still bound to 'in-the-box thinking'

### **5. Creative**

Teacher creates lessons to respond to specific teaching/learning contexts and challenges

FIGURE 6: FIVE LEVELS OF TEACHING



Source: (Obanya, 2010)

Teachers who possess PCK – who cannot be found in abundance in African education systems (Vavrus et al, 2011) – are able to teach at the fifth (creative) level of teaching. Stuart (2002)

summarises what integration by teachers should look like by describing it as teachers being able to develop their own appropriate pedagogical styles “in a way more akin to artistry.”

### 5.2.2. Interdisciplinary learning

In studying early iterations of the Teaching in Action programme in Tanzania, The Ministry of Education and Vocational Training (Tanzania) (2014) have found that training in-service teachers through workshops does not significantly impact teachers’ teaching methodology. The problem with workshops is that there usually is not enough time to explore all the vital issues. The Ministry of Education and Vocational Training (Tanzania), (2014) have found that they need to coordinate multi-layered activities for the training of in-service teachers. This requires joint action from universities, NGOs and other organisations that are interested in education.

The OECD (2012) hold similar sentiments with The Ministry of Education and Vocational Training (Tanzania), (2014) – education of both teachers and students needs to promote connections across various activities and subjects. These activities should take place both in and outside the formal education setting. The following list of activities is made up of the most prominent activities listed in literature, that will encourage interdisciplinary learning for teachers: Case studies, classroom observations, coaching, communities of practice, mentoring, reflective supervision, workshops and seminars, and university and other tertiary institute programmes (Cherrington, 2017; Gomendio, 2017; The Ministry of Education and Vocational Training (Tanzania), 2014; Obanya, 2010; Schleicher, 2015; Webber & Miller, 2016)

### 5.2.3. Inquiry-based learning

The teaching profession needs to be rebranded as it is currently incorrectly perceived in Africa (Obanya, 2010). Cherrington (2017) and the OECD (2012) believe that teachers need to

critically examine their roles in the classroom. Teachers need to be able to see themselves as learners too. Vavrus et al. (2011) take this notion further and state that teachers need to acknowledge and believe that knowledge is co-created between learner and teacher. Teaching in this manner challenges the authority given to teachers – they should no longer be seen as the knowledge bearers in the classroom. This would see teachers moving up from the dictatorial level of teacher and closer towards the creative level as depicted by Obanya (2010).

Once teachers have been able to successfully reimagine their roles in the classroom, they should rather see themselves as facilitators of learning. Learners should be given more autonomy and responsibility for their learning. The premise is that this will increase learners' intrinsic motivation to self-develop.

Inquiry-based teaching and learning utilises design- and problem-based scenarios for effective learning. This form of learning is more powerful when done with a small group of learners. Teachers guide their learners in understanding the problem, after which, students need to apply their knowledge to design a solution. These designs are to be evaluated by the learners themselves. Reflection on failures and successes will lead to learners revising their solutions accordingly. The learner is continuously assessed by the teacher throughout this process (OECD, 2012).

Vavrus et al. (2011) advise that teachers need to be taught in a way which they can grasp the terms and concepts of PLMs. Through the process of self-discovery and inquiry-based activities, teachers will continuously improve their knowledge. The learning journey is one that is continuous. Bell (2010) states that teachers need to be able to solve real learning problems daily. For this to happen, teachers need to become researchers (Bell, 2010; OECD, 2012; Webber & Miller, 2016; Gomendio, 2017; Obanya, 2010).

Teachers are to become researchers in two ways. Firstly, teachers need to incessantly improve their professional knowledge and skills. Knowledge is always being generated and teachers need

to stay up to date with what is out there. Obanya (2010) suggests that teachers attain higher degrees and frequently participate in short courses and workshops to improve their professional knowledge. Moreover, teachers should aim to possess global awareness which will assist in contextualising their lessons.

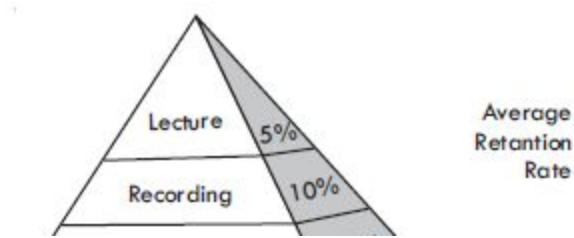
The second research element is underpinned by self-evaluation. Teachers need to be asking questions of their classroom delivery and environment for each of their classes and students. Vavrus et al. (2011) describe this as a process of conducting qualitative, classroom-based research. Noting what has and has not worked will allow for the revising of their teaching methods. Webber and Miller (2016) recommend that these practical teaching and learning journeys happen with supervision of a mentor.

#### 5.2.4. General learning

One of the conclusions reached by Vavrus et al. (2011) is that reforms on teacher pedagogy should be focused at the pre-service teaching stage. This is due to the high resilience of teacher-centred teaching approaches – especially with older teachers. Without high quality and consistent training, teachers generally revert to teaching the way in which they were taught. Obanya (2010) discovered the same phenomenon unfolding in Nigeria – teachers find it hard to switch to teach in the way they have been taught to teach rather than how they have been taught.

Obanya (2010) provides more insight into how individuals learn by looking at retention rates based on different learning methodologies. The image below illustrates that people learn best when they teach others. The average retention rate of learning by teaching is 90%. Learning by doing is the second most effective method of learning with a retention rate of 75%.

FIGURE 7: RATES OF LEARNING RETENTION





Source: (Obanya, 2010, 22)

## **5.2. Self-efficacy, Hope, and Individualized Learning**

Apart from the content and pedagogy needed to teach, there is a 'human' element to teaching that teachers need to be cognisant of. The human element is vital to how the teacher manages the classroom environment. This goes hand-in-hand with PCK in fostering the ideal learning environment.

### **5.2.1. Self-efficacy**

Self-efficacy is a significant determinant of human behaviour. Schleicher (2015) explores self-efficacy within the classroom in OECD countries. Schleicher (2015) finds that there are links between poor learner self-efficacy and higher learner misbehaviour, lower enthusiasm to learn, and lower levels of academic achievement.

A teacher's belief in their ability to teach, engage learners, and manage the classroom has an impact on the teacher's practices, enthusiasm, commitment, and behaviour in the classroom. This in turn has an influence on how learners perform. Furthermore, poor self-efficacy in teachers is linked to higher levels of work-related stress and lower levels of job satisfaction (Schleicher, 2015).

### **5.2.2. Hope and well-being**

Cherrington (2017) conducted a transformative, visual participatory study on rural South African children on hope and well-being. Based on findings of this study, Cherrington (2017) argues that teachers need to be trained on the importance of well-being. Gomendio (2017) found there to be similar associations in OECD countries – teacher effectiveness in OECD classrooms is susceptible to fluctuations in teacher well-being. Teachers are therefore required to possess high levels of social and emotion well-being. This is in order for the teachers to have the ability to deal with children with differentiated socioemotional characteristics. All of this,

Cherrington (2017) explains, is to allow for teachers to foster an environment of well-being in the classroom.

Leavers of the South African education system ought to be equipped to bring about social change. Hope is a key ingredient to social change – hence teachers are compelled to root their teaching in hopefulness (Cherrington 2017). Hope is complex in that it is contextual. Biological and social circumstances are determinants of hope. Cherrington (2017) uses the philosophy of ubuntu – a deeply rooted African value system which promotes purpose and meaning in life – as an example of an African contextual lever of hope.

### 5.2.3. Individualized Learning

The environment within the class will be subject to the diverse personalities present in the classroom – including that of the teacher. Creating and maintaining classroom well-being will require teachers with sufficient skills to facilitate individualised learning (Gomendio 2017). A report released by the OECD (2012) describes the learning environment in a classroom as being acutely sensitive to individual differences. Bell (2010) agrees with Gomendio (2017) and the OECD (2012), and underlines the importance of teachers taking extensive care for each learner in their class. This therefore necessitates teachers to be proficient problem solvers.

When exploring individualised learning, Gomendio (2017) focusses on teachers providing additional support to learners who might be struggling, relative to the rest of the class. Schleicher (2015) instead, contends that learners who are advanced also present a challenge to sustaining individualised learning. The findings from OECD (2012) countries show that if more than 10% of learners are low performing or have behavioural issues, then teacher self-efficacy and job performance are adversely affected. The same holds true if more than 10% of learners are gifted. This is indicative to the fact that it is harder to teach children with a wide array of academic ability.

### **5.3. Implications for Measurement**

The transformation process of education systems to be progressive is one that requires a lot of smaller mechanisms to be conducted thoroughly. And of course, there will be various obstacles that either stall, completely prevent, or diminish progress towards achieving the envisaged goals. This section is going to outline some of the more prominent obstacles that have come out of the literature.

TABLE 8: THE CASE OF TANZANIA

Tanzania has been putting in efforts to improve the quality of their education since before they gained independence in 1961. Tanzania has been moving away from teacher-centred methods since at least 1982 (Vavrus et al. 2011). The Ministry of Education and Culture noted a consistent decrease in their quality of education over the years. They attributed this decline to a higher demand in education which decreased the teacher to pupil ratio. To combat the decline in the quality of education and to better align their education system to learner-centred pedagogy (LCP), the Ministry created subject guidelines to use for LCP in 2005.

The Teaching in Action programme was launched in tandem to the 2005 release of subject guidelines. This is a professional development programme targeted at in-service teachers at secondary level and lecturers at a university college of education. At the secondary teacher level, the intervention has two core components; namely, a week-long intensive and extensive professional development programme at an education college and the creation of professional learning communities (Vavrus et al. 2011).

The week-long professional development aspect of the programme is split up into two segments. Participants are taught the theoretical elements of LCP in the mornings, which includes providing examples of how LCP should be implemented in the classroom. The afternoons would then dovetail into the application of the LCP theories learnt. During these sessions, emphasis is placed on making sure that the application of LCP is subject specific.

As part of the creation of professional learning communities, teachers are granted the opportunity to experience these learning communities through feedback sessions provided by faculty, tutors, and fellow teachers during the week-long programme. The premise for this is that teachers are expected to continue these peer-to-peer sessions after the intervention. This will become a platform for teachers to share teaching and learning resources.

- I. Progressive teaching methodologies are more time intensive relative to dictatorial and didactic approaches. Webber and Miller (2016) find that the time it takes teachers to plan, implement, and assess both learners and themselves can be overwhelming for teachers – who then revert to their old styles of teaching. Gomendio (2017) expands further on the time issue and states that continuous professional development – which is crucial to successfully transition – adds to the workload of a teacher. This also

increases the likelihood of reverting to old ways. Teachers therefore need to be trained in how to efficiently manage their time. Time is also a factor for principals – who are seen as custodians of PLMs (Gomendio, 2017). The monitoring and sustaining of PLMs requires principals to create time in their already demanding schedules.

2. Teachers in South African can feel unprepared to handle overcrowded classrooms that are under resourced (Cherrington, 2017). This is noteworthy seeing that progressive learning methodologies are most effective in small groups where teachers can give each learner increased time and attention. The lack of resources in classrooms is another factor to note due to technology playing a substantial role in the delivery of PLMs (The Ministry of Education and Vocational Training (Tanzania), 2014; Asia and Pacific Regional Bureau for Education, 2003; Vavrus et al. 2011). In cases where technology would be available, teachers would then need to be trained on how to best leverage these technologies to implement PLMs.
3. The biggest obstacle faced by The Ministry of Education and Vocational Training (Tanzania), 2014) in transitioning to PLMs was the lack of continuous professional development opportunities for teachers (Schleicher, 2015). Changing teacher mindsets takes a lot time and practice. Without consistent exposure, teachers shirk on using PLMs. Inequitable and uncoordinated access to professional development for teachers undermines progress on a macro scale (Vavrus et al. 2011).
4. The unification of policies and programmes is an imperative step towards reforming education. Teachers are more likely to revert to teaching how they were taught if surrounding policy is not aligned with the reform. Vavrus et al. (2011) found that a significant stumbling block in Ghana's reform was that assessments and examinations were not aligned to PLMs. Teachers were therefore pressured into teaching using old

methods because that is how their learners would be tested – and that is ultimately how a teacher’s performance is gauged.

5. The last substantial obstacle in reforming education is evident when evaluating success or failure of the programme. The difficulty lies in the gap between what teachers profess to know and what they actually know. Upon conducting classroom observations, The Ministry of Education and Vocational Training (Tanzania), (2014) discovered that teachers do not fully understand PLMs. Additionally, PLMs are mostly implemented in informal settings for themes that are not deemed a priority (The Ministry of Education and Vocational Training (Tanzania), 2014; OECD, 2012; Vavrus et al., 2011).

## 6. CONCLUSION

This literature review explores two major discourses on education reform, namely 21<sup>st</sup> century teaching and learning and entrepreneurship education. Twenty-first century and entrepreneurship education have both been central to the discussion and debate around how best to prepare learners for a rapidly changing world and to ensure their success, both in the global and local contexts. This paper outlines some of the major tenets of these two bodies of literature and identifies some of the most commonly cited competencies for the modern world. Based on the analysis of various frameworks—international, regional and scholar approaches—it is clear that there is no single, prescriptive standard for what 21CC should be prioritized, nor is there one way that these should be defined or implemented across different contexts. There is therefore sufficient room for the E<sup>3</sup> programme to develop its own framework of competencies, which includes the common hallmarks of what is found in the most prominent expressions of 21CC, is in line with international best practice and also integrates contextual or localized approaches. The existing frameworks should act as guidelines—with the programme considering a number of different models and making adaptations to fit into the South African context.

South Africa's education context is complex and has a long historical legacy of inequality. The solutions to the problems in education will naturally be multi-pronged and focused on different aspects of the system. However, the case for focusing on what happens in the classroom—how teachers teach and how learners learn and what they should learn—is a compelling one. And 21<sup>st</sup> century and entrepreneurship education offer some direction around how both teacher and learner deficiencies might be addressed.

The literature is very clear on the fact that the significance of teachers and the role they ought to play to develop future-proof learners cannot be downplayed. Teachers, along with their training and support, needs to be top priority, as the realization of a 21CC depends on their

ability to implement the curriculum as intended. The E<sup>3</sup> programme's theory of change is therefore validated in the literature; however, particular attention needs to be paid to the literature which showcases tried and tested models for teacher development to sustain lasting change.



## 7. REFERENCES

- Allan Gray Orbis Foundation. 2019. "The State of Entrepreneurship in South Africa." *Allan Gray Orbis Foundation* (blog). March 8, 2019.  
<https://www.allangrayorbis.org/entrepreneurship-blog/the-state-of-entrepreneurship-in-south-africa/>.
- Ananiadou, Katerina, and Magdalena Claro. 2009. "21st Century Skills and Competences for New Millennium Learners in OECD Countries." *OECD Education Working Papers* 20 (41). <https://doi.org/10.1787/218525261154>.
- Asmal, Kader, and James Wilmot. 2001. "Education and Democracy in South Africa Today." *Daedulus, Why South Africa Matters*, 130 (1): 185–204.
- Badat, Saleem. 2009. "The Challenges of Education and Development in Twenty-First." presented at the 15th Annual Conference of the Headmasters of the Traditional State Boy's Schools of South Africa, Queens College, Queenstown, August 26.
- Barnes, Mark. n.d. "Five Steps to Create a Progressive, Student-Centered Classroom." ASCD Inservice. Accessed September 17, 2019.  
<http://inservice.ascd.org/five-steps-to-create-a-progressive-student-centered-classroom/>.
- Berg, Servaas van der. 2007. "Apartheid's Enduring Legacy: Inequalities in Education." *Journal of African Economies* 16 (5): 849–80. <https://doi.org/10.1093/jae/ejm017>.
- Boyles, Trish. 2012. "21st Century Knowledge, Skills and Abilities and Entrepreneurial Competencies: A Model for Undergraduate Entrepreneurship Education." *Journal of Entrepreneurship* 15: 42–56.
- Broekhuizen, Hendrik van, and Servaas van der Berg. 2013. "How High Is Graduate Unemployment in South Africa? A Much-Needed Update." *Econ 3x3*. May 12, 2013.  
<http://www.econ3x3.org/article/how-high-graduate-unemployment-south-africa-much-needed-update>.
- Business Tech. 2019. "How Much You Need to Earn Each Month to Be in the Richest 1% in South Africa." August 22, 2019.  
<https://businesstech.co.za/news/wealth/336309/how-much-you-need-to-earn-each-month-to-be-in-the-richest-1-in-south-africa/>.
- Care, Esther, Patrick Griffin, and Mark Wilson, eds. 2018. *Assessment and Teaching of 21st Century Skills: Research and Applications*. Educational Assessment in an Information Age. Springer International Publishing.  
<https://www.springer.com/gp/book/9783319653662>.
- Care, Esther, Helyn Kim, Alvin Vista, and Kate Anderson. 2018. "Education System Alignment for 21st Century Skills: Focus on Assessment." *Optimizing Assessment for All (OAA)*. Washington, DC: Brookings Institution.
- CHE. 2016. "South African Higher Education Reviewed: Two Decades of Democracy." Council on Higher Education.  
[https://www.che.ac.za/sites/default/files/publications/CHE\\_South%20African%20higher%20education%20reviewed%20-%20electronic.pdf](https://www.che.ac.za/sites/default/files/publications/CHE_South%20African%20higher%20education%20reviewed%20-%20electronic.pdf).
- Elmore, Richard F. 2008. "Improving the Instructional Core," 16.

- Elst, Lynn van der. 2016. "Innovation in Education: A Technical Report." MIET Africa. [https://www.miet africa.com/wp-content/uploads/2016/09/Innovation\\_in\\_Education\\_Technical\\_Report\\_March\\_2016.pdf](https://www.miet africa.com/wp-content/uploads/2016/09/Innovation_in_Education_Technical_Report_March_2016.pdf).
- Gamede, Bongani Thulani, and Chinaza Uleanya. 2017. "The Role OF Entrepreneurship Education in Secondary Schools at Further Education and Training Phase." *Academy of Entrepreneurship Journal* 23 (2): 12.
- Hooks, Bell. 1994. *Teaching to Transgress: Education as the Practice of Freedom*. New York: Routledge.
- Kennedy, Robert. 2019. "Progressive Education: How Children Learn." ThoughtCo. May 30, 2019. <https://www.thoughtco.com/progressive-education-how-children-learn-today-2774713>.
- Kereluik, Kristen, Punya Mishra, Chris Fahnoe, and Laura Terry. 2013. "What Knowledge Is of Most Worth: Teacher Knowledge for 21<sup>st</sup> Century Learning." *Journal of Digital Learning in Teacher Education* 29 (4): 127–40. <https://doi.org/10.1080/21532974.2013.10784716>.
- Marope, Mmantsetsa, Patrick Griffin, and Carmel Gallagher. 2017. "Future Competences and the Future of Curriculum: A Global Reference for Curricula Transformation." In . International Bureau of Education (IBE).
- Moodley, Sudeshen. 2016. "Creating Entrepreneurs in South Africa through Education." Masters of Business Administration, Pretoria: University of Pretoria.
- Mouton, Nelda, G.P. Louw, and G. Strydom. 2012. "Critical Challenges Of The South African School System." *International Business & Economics Research Journal (IBER)* 12 (1): 31–44. <https://doi.org/10.19030/iber.v12i1.7510>.
- Msimanga, Audrey Sibanda. 2013. "Talking Science in South African High Schools: Case Studies of Grade 10-12 Classes in Soweto." Doctor of Philosophy, Johannesburg: University of the Witwatersrand.
- New World Encyclopedia. 2019. "Progressive Education." New World Encyclopedia. June 16, 2019. [https://www.newworldencyclopedia.org/entry/Progressive\\_education](https://www.newworldencyclopedia.org/entry/Progressive_education).
- OECD. 2012. *Preparing Teachers and Developing School Leaders for the 21st Century: Lessons from around the World*. Edited by Andreas Schleicher. International Summit on the Teaching Profession. OECD. <https://doi.org/10.1787/9789264174559-en>.
- Oudeweetering, Karmijn van de, and Joke Voogt. 2017. "Teachers' Conceptualization and Enactment of Twenty-First Century Competences: Exploring Dimensions for New Curricula." *The Curriculum Journal* 29 (1): 166–133. <https://doi.org/10.1080/09585176.2017.1369136>.
- Pienaar, Jaco, and Debri van Wyk. 2006. "Teacher Burnout: Construct Equivalence and the Role of Union Membership." *South African Journal of Education* 26 (4): 541–51.
- Saavedra, Anna Rosefsky, and V. Darleen Opfer. 2012. "Learning 21st-Century Skills Requires 21st-Century Teaching." *Phi Delta Kappan* 94 (2): 8–13. <https://doi.org/10.1177/003172171209400203>.
- Seth, Shobhit. 2019. "Why Is Entrepreneurship Important to the Economy?" Investopedia. July 22, 2019.

- <https://www.investopedia.com/articles/personal-finance/101414/why-entrepreneurs-are-important-economy.asp>.
- Soffel, Jenny. 2016. "What Are the 21st-Century Skills Every Student Needs?" World Economic Forum. March 10, 2016.  
<https://www.weforum.org/agenda/2016/03/21st-century-skills-future-jobs-students/>.
- Spaull, Nicholas. 2013. "Poverty & Privilege: Primary School Inequality in South Africa." *International Journal of Educational Development* 33 (5): 436–47.  
<https://doi.org/10.1016/j.ijedudev.2012.09.009>.
- . 2019. "Priorities for Education Reform (Background Note for Minister of Finance)." *Nic Spaull* (blog). January 19, 2019.  
<https://nicspaull.com/2019/01/19/priorities-for-education-reform-background-note-for-minister-of-finance-19-01-2019/>.
- State University. n.d. "Learning Theory: Constructivist Approach." Accessed September 25, 2019.  
<https://education.stateuniversity.com/pages/2174/Learning-Theory-CONSTRUCTIVIST-APPROACH.html>.
- Stats SA. 2019a. "Youth Graduate Unemployment Rate Increases in Q1: 2019." May 15, 2019.  
<http://www.statssa.gov.za/?p=12121>.
- . 2019b. "Quarterly Labour Force Survey (QLFS) – Q2:2019." July 30, 2019.  
<http://www.statssa.gov.za/?p=12370>.
- Tan, Jennifer Pei-Ling, Suzanne S. Choo, Trivina Kang, and Gregory Arief D. Liem. 2017. "Educating for Twenty-First Century Competencies and Future-Ready Learners: Research Perspectives from Singapore." *Asia Pacific Journal of Education* 37 (4): 425–36.  
<https://doi.org/10.1080/02188791.2017.1405475>.
- The Daily Vox. 2019. "Educational Inequality: The Dark Side Of SA's Education System." *The Daily Vox* (blog). March 19, 2019.  
<https://www.thedailyvox.co.za/educational-inequality-the-dark-side-of-sas-education-system-2/>.
- The Institute of Progressive Education and Learning. n.d. "Pedagogical Methodology Models." The Institute of Progressive Education and Learning. Accessed September 17, 2019.  
<http://institute-of-progressive-education-and-learning.org/innovation-education/pedagogical-methodology-models/>.
- Voogt, Joke, and Natalie Pareja Roblin. 2012. "A Comparative Analysis of International Frameworks for 21st Century Competences: Implications for National Curriculum Policies." *Journal of Curriculum Studies* 44 (3): 299–321.  
<https://doi.org/10.1080/00220272.2012.668938>.
- Wagner, Tony. 2008. *The Global Achievement Gap: Why Even Our Best Schools Don't Teach the New Survival Skills Our Children Need - and What We Can Do about It*. New York: Basic Books.
- Worthington-Smith, Margie. 2008. "Concept Note for the E3 Pedagogical Underpinnings of the SA School Curriculum."

