NATIONAL EDUCATION COLLABORATION TRUST

HRDC: TASK TEAM 1

SOCIAL COMPACT APPROACH

BUILDING THE FOUNDATION FOR A TRANSFORMED ECONOMY AND SOCIETY

CONTENTS

COMPETENCIES FOR A CHANGING WORLD

5. COMPETENCIES FOR A CHANGING WORLD

PROFESSOR

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Her initial postdoctoral research included transformative learning, dialogic teaching and the design of learning environments in higher and adult education. In recent years, as part of her interest in higher education, her research has focused mainly on design of learning environments for teacher preparation. Currently her main research interests are the implications of the science of learning for teacher education, as well as education for a fast-changing world. She is the UJ lead investigator of a NECT project on teaching and learning in schools for a changing world (Sandbox project) and the implications for teacher education and development. She is the author and co-author of numerous books and articles on teaching and learning, teacher education and related themes and has supervised numerous postgraduate students to completion.

She views her involvement in establishing a school at UJ's Soweto campus as the most gratifying achievement of her career. The school was established to serve the education needs of young children, to serve as a learning site for the education of teachers and as an education laboratory.

INTRODUCTION

The theme of the envisaged 2020 HRDC summit is "Skills required for the 21st century". My brief for this paper is to focus on competencies for a changing world. Though the difference in nomenclature may seem inconsequential, it is important to be clear on how terms are used in the education sector and to what effect.

This paper is prepared during a time that the education sector must deal with the ramifications of the Covid-19 pandemic. It stands to reason that some envisaged plans and actions related to the aspects noted in the slides that will be referred to later in this document had to go on the backburner to prioritize the emergency needs related to schooling, teaching and learning during the pandemic. This paper must be read against this backdrop.

The paper commences with a section that talks to nomenclature. This is followed by a summary of international literature that addresses 21st century skills/competencies and skills/competency frameworks. The paper then discusses some of the Department of Basic Education initiatives (some planned and others already implemented) to fast-track skills/competency development. The final section of the paper provides recommendations.

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NOMENCLATURE

The terms 21st century skills/competences/competencies are sometimes used interchangeably in the literature. At the same time these terms have exact meanings in specific frameworks. Thus, the issue is not as much which terms are or should be used, but that there should be clarity on what the terms denote when they are used.

The report Education for life and work: developing transferable knowledge and skills in the 21st century (Pellegrino & Hilton, 2012) indicates that as a first step toward describing 21st century skills, three domains of competence were identified, namely, cognitive, intrapersonal, and interpersonal, while acknowledging that the three domains are intertwined in human development. The domains are distinguished for the purpose of understanding and organizing 21st century skills. Pellegrino and Hilton (2012, p. 23) define 21st century skills as "knowledge that can be transferred or applied in new situations. This transferable knowledge includes both content knowledge in a domain and procedural knowledge of how, why, and when to apply this knowledge to answer questions and solve problems. The latter dimensions of transferable knowledge (how, why, and when to apply content knowledge) are often called "skills." Pellegrino and Hilton refer to the blend of

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content knowledge and related skills as "21st century competencies." They note that their use of "competencies" reflects the terminology used by the OECD.

The OECD (2005, p. 4), defines a competency as: "more than just knowledge and skills. It involves the ability to meet complex demands, by drawing on and mobilising psychosocial resources (including skills and attitudes) in a particular context. For example, the ability to communicate effectively is a competency that may draw on an individual's knowledge of language, practical IT skills, and attitudes towards those with whom he or she is communicating".

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- The report "Key competences and new literacies: From slogans to school reality" (Dobryakova et al. 2018) is the result of a project supported by the World Bank and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

- The document makes the point that there are multiple conceptualisations of competence. All concur, however, that competence involves a capacity to act in a certain way, and this capacity is underpinned by associated knowledge, skills, and attitudes. Competence is defined in this report as "a set of an individual's integrated capabilities composed of clusters of knowledge, skills, attitudes, and values that are mobilized in a particular context to meet the requirements of a given task or problem" (p. 41).

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The report describes knowledge as consisting of established facts and figures, concepts, ideas and theories that support the understanding of a certain area or subject; skills are defined as the ability and capacity to carry out processes and use the existing knowledge to achieve results; attitudes involve the disposition and mind-sets to act or react to ideas, persons or situations. The key competences identified in this report are thinking and reasoning competence; interpersonal competence and intrapersonal competence. In addition to competences, key literacies are identified.

Literacy in its narrow sense refers to the acquisition and usage of the abilities of Reading, wRiting, and aRithmetic, the so-called 3Rs. In its broader sense, literacy denotes the capacity of individuals to analyze, reason and communicate effectively as they pose, solve and interpret problems in everyday life and in subject matter areas. Two main kinds of literacy are identified in the report, namely general tool-based and content-specific.

The Framework of future competences developed by UNESCO's International Bureau of Education also focuses on competences. Competence is defined "as the developmental capacity to interactively mobilize and ethically use information, data, knowledge, skills, values, attitudes, and technology to engage effectively and act across diverse 21st century contexts to attain individual, collective, and global good" (Marope, Griffin, & Gallagher, 2019, p 27).

The document developed by the Centre for Curriculum Redesign (CCR) Competencies and Subcompetencies: Proficiency levels (Bialik, Hall & Giebler, 2018) unpacks some elements of the Four dimensional education framework, developed by the CCR (Fadel, Bialik, Trilling, 2015). The Framework consists of knowledge, skills, character, and meta-learning. Knowledge refers to what we know and understand. The other dimensions are competencies – skills (how we use what we know), character (how we behave and engage in the world) and meta-learning (how we reflect and adapt). In other words – competencies involve a mix of social, emotional, and cognitive capabilities.

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The question arises – what is the focus – competencies, competences or skills? The assumption here is that the focus is competencies (which includes skills). If so – what competencies come into play when

BACKGROUND – DRAWING ON INTERNATIONAL LITERATURE

Overview

Klaus Schwab, founder and executive chairman of the World Economic Forum, coined the term fourth industrial revolution (4IR). He makes the case in his book, The fourth industrial revolution, that we are at the beginning of the "new technology revolution" that is fundamentally changing our lives (Schwab, 2016, p. 1). Whether or not one agrees with Schwab about the 4IR term, it is indisputable that the pervasiveness and exponential pace of technology developments will result in a future that is volatile, uncertain, complex, and ambiguous, often referred to by the acronym VUCA (Organisation for Economic Cooperation and Development, OECD, 2018).

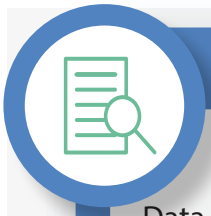
- This understanding has given rise to the widespread call that education should explicitly address the competencies that young people need to survive and prosper in the 21st century context. These competencies are often referred to in the education literature as 21st-century skills/competencies. Frameworks in which these competencies are presented abound (e.g., Trilling & Fadel, 2009).

Voogt and Roblin (2012) contend that 21st-century competencies are generally characterised as being relevant across many fields. Competencies include subject knowledge and skills such as the ability to cope with complex problems and unpredictable situations. Lutherbach and Brown (2011) argue that citizens who live in a rapidly changing world, need to be digitally literate, self-directed problem solvers, have social skills that include being able to work collaboratively, ethically, responsibly and with accountability. Key 21st-century competencies are commonly referred to as the 4C's namely critical thinking, creativity, collaboration, communication and some literature adds character education and citizenship, labelling it the 6C's (Fadel, Bialik, & Trilling, 2015; Fullan & Langworthy, 2014; Schleicher, 2012).

A somewhat obvious point is that many of the so-called 21st-century skills are not new or 21st-century at all. For example, the desire to cultivate the four Cs, which are widely touted as fundamental for learning and working in the 21st century, has been an education ideal for a long time. What is new is that due to the acceleration of change and complexity, success in learning, work and life will increasingly depend on having such skills. And as Harari (2018) rightly noted, schools have been rather slack in nurturing these skills.

Kirchner and Stovayov (2018, p. 3) made the point that, due to the information explosion, coupled with the lack of guarantee of the reliability of that information, the skills that are truly 21st-century are information literacy and information management. These authors therefore prefer the term "future-proof learning" when referring to the skills, knowledge and attitudes "necessary to continue to learn in a stable and enduring way in a rapidly changing world".

- Much is also written about the need to develop digital, information and data and literacy due to digitalisation in all areas of life. Also – through digitisation, information output is growing exponentially. The result is that all individuals need to be capable of processing multiple forms of information to complete tasks. Information literacy includes the ability to minimise or broaden relevant information on a topic; to understand the difference between trustworthy information or invalid information from the internet; and to synthesise information to create new knowledge (Koltay, 2011).



Data literacy refers to the ability to understand and use multiple data sources efficiently to inform decisions (Dunlap & Piro, 2016). With the explosion of data and the advent of "big data", data literacy becomes increasingly important.

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Digital literacy encompasses not only the ability to find and use digital content but also knowing how to create and share digital content (Dobryakova et al., 2018).

The notion of 21st century education or education for a VUCA world is often discussed in relation to the fourth industrial revolution (4IR). The case is made in the World Economic Forum (WEF) report "Schools of the Future. Defining New Models of Education for the Fourth Industrial Revolution" that many of today's school children will work in jobs that do not exist yet. It is thus not possible to prepare children for jobs of the future in a narrow sense. However, it is likely that these jobs will place an increased

premium on both digital and social-emotional skills (World Economic Forum, 2020). The World Economic Forum report (2020) puts forward eight critical characteristics in learning content and experi¬ences to define high-quality learning in the Fourth Industrial Revolution, which is referred to as "Education 4.0". These are global citizenship skills, innovation and creativity skills, technology skills, interpersonal skills, personalized and self-paced learning, accessible and inclusive learning, problem-based and collaborative learning, and lifelong and student-driven learning.

Claus Schwab contends that education for the fourth industrial revolution requires that "students must be adept not only at understanding technological change and using technology, but also in developing profoundly human skills such as leadership, social-emotional intelligence and critical thinking. If competition has defined the education of the past, collaboration, empathy and teamwork will define the education of the future. Moreover, we need to impart students with a new flexible and adaptable mind-set about learning, one that emphasizes the need for continued, lifelong learning. To embrace such a mind-set, students must learn to be curious about their changing environment and develop the resilience necessary to not just manage but to thrive on change. The future of education content is thus neither wholly digital nor wholly human but a hybrid of both." (Doucet, et al, 2018: xv)

In relation to the focus of this paper, the skills/competencies that are emphasised as crucial to survive and thrive in the fourth industrial age are similar to those put forward in skills/competency frameworks discussed in the next section.

Skills/competency/competence frameworks

A plethora of skills/competency/competence frameworks for 21st-century education have been developed. A summary of some of these can be found in Voogt and Roblin (2012). Here a few prominent ones are mentioned.

- These are global citizenship skills, innovation and creativity skills, technology skills, interpersonal skills, personalized and self-paced learning, accessible and inclusive learning, problem-based and collaborative learning, and lifelong and student-driven learning.

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- The OECD's "Future of education and skills, 2030" project uses the term learning compass "to show the types of competencies students need in order to navigate towards the future we want, individually and collectively" (OECD, 2019b, p. 15). It is intended to be an "evolving learning framework that sets out an aspirational vision for the future of education" (OECD, 2019a, p. 1). The framework is not a curriculum framework but provides a broad vision of the type of competencies that students will need to thrive in 2030 and beyond.

The Four dimensional education framework (Fadel, Bialik, & Thrilling, 2015) aims to synthesize "existing research and best practices" (p. 29) and serves as an organizing/guiding framework that can help to re-examine school curricula for 21st-century education.

- framework includes four dimensions, namely knowledge, skills, character and meta-learning. Knowledge is defined as “what we know and understand” and includes traditional (disciplinary) knowledge, modern (interdisciplinary) knowledge (e.g. entrepreneurship) and themes (e.g. global literacy, information literacy; environmental literacy). Skills refer to how we use knowledge, what we do with what we know. The 4Cs are foregrounded – critical thinking, creativity, communication and collaboration.

- The choice of the 4Cs was informed by feedback from education role players requesting more simplicity to make skills recommendations actionable. Character is about how we behave and engage in the world and include e.g. mindfulness, curiosity, and ethics. The meta-learning dimension is about how we reflect and adapt. The different dimensions are intertwined in the classroom. Thus, skills, are for example, learned through and with the learning of content (knowledge).

THE FRAMEWORK OF FUTURE COMPETENCES

developed by UNESCO’s International Bureau of Education (Marope, Griffin, & Gallagher, 2019). It is indicated in the IBE document that the Framework offers a global normative guide for competence-based curricula that can support the attainment of the Education 2030 Agenda. It can be deduced that the IBE wishes its framework to serve as a “neutral or generic supra level framework of future competences that countries can use as a reference point and that is easy to adapt to their contexts” (p. 8).

THE FRAMEWORK CONSIST OF CONSTITUENT ELEMENTS, MACRO COMPETENCES MICRO COMPETENCES.

The Framework consists of constituent elements, macro competences and micro competences. It also presents examples of the individual, collective, and public "good" that should accrue from having certain competences, or the impact of competences.

The constituent elements are information, data, technology, knowledge, skills, values and attitudes. These constituent elements interact and intertwine to produce seven macro (stable competences) namely lifelong learning; self-agency; interactively using diverse tools and resources; interacting with others; interacting with the world; multi-literateness; and trans-disciplinarity. These competences are considered relevant across contexts. They are the bigger picture and the overarching "why" of a curriculum.

- The seven macro competences are specified through micro (adaptable) competences. The framework presents an indicative, not exhaustive, list of micro competences that contribute to the macro level ones.

  For example, the indicative micro competences for the macro competence life-long learning are curiosity, creativity and critical thinking; and the indicative micro competences for self-agency are initiative/drive/motivation, endurance/grit/resilience and responsibility; and the indicative micro competences for multi-literateness are reading and writing, numeracy and digital.

WHAT IS CURRENTLY BEING DONE TO FAST-TRACK SKILLS DEVELOPMENT IN PROGRAMMATIC AREAS, AND WHAT ARE THE KEY CHALLENGES?

This section draws mainly on two sources: Summary of an interview conducted with Chief Director for Mathematics Science and Technology (MST) and Curriculum Enhancement Programmes, Mr Seliki Tlhabane, and the slides used at the TDCM/NEAC HEDCOM Sub-Committee for agenda item G.2 Skills and Competencies for the Changing World and their implications for Assessment and Examinations, including the IBE Framework (XXX date?).

Being slides, which are by necessity cryptic, it is possible that the summary presented via the slides does not reflect decisions taken or intent precisely. Furthermore, because it was not possible to get hold of corroborating documents or documents that elaborate on the slides, it is probable that some of the analysis that follows does not do justice to work that has been done in the meanwhile.

Slide 4 indicates that the Commission focused on "the Skills for the Changing World" and that questions it attempted to respond to are: "What are the core skills and competencies for the curriculum from birth to grade 12? How will the Three Stream Model give effect to this? How will entrepreneurship and the Fourth Industrial Revolution be integrated into the curriculum?

THE IBE FRAMEWORK AND ITS ROLE

Slide 7 on "Inputs from the last retreat and BMM" poses the question: "What are the core skills and competencies for the curriculum from birth to Grade 12?" It is indicated that the recommendation was made to "adopt an adaptable competence and skills framework that will be responsive to the future needs of the country" and that the IBE Framework was adopted. One of the slides (slide 25) that puts forward the "plans and concrete actions for the next 5 years" notes that the "IBE competence framework with additional skill" was adopted in February 2019.
Comment: It is indeed the case that the IBE Framework is broad and adaptable. However, it does not purport to be a skills or competency framework. Which "additional skill" (skills framework?) is referred to here

COMPETENCE BASED CURRICULUM

The slide titled "Competence based curriculum" (slide 25) indicates "Develop a competence-based curriculum integrating the skills and competencies across the subjects in line with the IBE Framework" (time frame: December 2020).

Comment: Which skills and competencies are referred to here, since the IBE Framework does not unpack skills and competencies? It focuses mainly on macro competences that could guide curriculum transformation. Has an "additional skill" (skills) framework been developed, and if so – does it draw from a pre-existing framework or does it integrate different skills frameworks?

What is implied by "develop a competence-based curriculum"?

- The current school curriculum is knowledge based and organized in subjects. The IBE document juxtaposes subject-based and competence-based curricula. It is stated on p. 25 of the IBE document that the transition from subject-based to competence-based curricula requires careful management, and it is stated on p. 28 that "in contrast to competence-based curricula, subject-based curricula are mostly grounded in an understanding of the subject matter content or the disciplines" and on p. 29 "Competence-based curricula are structured around competences and not around subjects, and progression relates to the competence rather than subject matter". So – what does "in line with the IBE Framework denotes in relation to a competence-based curriculum?
  Is the intent to infuse/integrate competencies (skills? competences?) into the existing curriculum? This seems to be implicit in the question "What are the core skills and competencies for the curriculum from birth to Grade 12?" If so – then the phrasing of "developing a competence-based curriculum" could be confusing and requires clarification. What phrasing would accurately capture the intent?

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The ministerial statement when the matric results were released in 2019 noted that the Brookings Institute found that the South African school curriculum has embedded in it the competencies required for a changing world. These include critical thinking and problem-solving, creativity and innovation, collaboration and teamwork, communication and information literacy, as well as social justice and human rights.

The ministerial statement also expressed the need for the Basic Education sector to refocus the curriculum towards a competence-based approach, integrating 21st century skills across the subjects.
A recent statement of the Minister of Basic Education (22 July 2020) indicated that the vision of "of the post-COVID-19 basic education is anchored on the immediate implementation of a curriculum with skills and competencies for a changing world." https://pmg.org.za/briefing/30767/.

Infusing/integrating competencies into the curriculum does not require overhauling an existing curriculum. Research in the learning sciences is unequivocal that teaching skills and competencies separately or as add-ons is often futile. Skills, competencies and knowledge are not separate, but intertwined (Willingham, 2008).

-). Thus, competencies should be infused into the teaching of content knowledge. However, as Charles Fadel (2019), from the CCR noted – a claim that competencies are prominent in a curriculum is valid only if there is evidence of deliberate, comprehensive, systematic and demonstrable infusion.

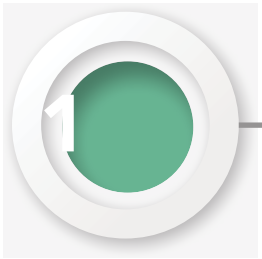
. The implication is that if curricula are overcrowded with content the deliberate, comprehensive, systematic and demonstrable infusion of the chosen competencies will fall on the wayside. Also, there needs to be clarity on which competencies should be prioritized and why and how.

Furthermore, as Andreas Schleicher (2019) warned, many countries are responding to the need to transform education for the need of the fast-changing technology-rich world by layering more content on top of the school curricula. As a result, covering content becomes the focus instead of cultivating depth of understanding. He makes the case for focusing on the essence of subjects, cultivating deep conceptual understanding. The cognitive psychologist David Perkins (2014) make a similar case indicating that school curricula should foreground "lifeworthy knowledge" i.e. knowledge that is likely to matter in the lives learners are likely to live.

These views are consistent with the notion of deliberately infusing competencies into the curriculum. The competencies are not add-ons, but are cultivated deliberately through pedagogies that support deeper learning.

The type of learning to acquire competencies is "deep(er) learning", also referred to as "meaningful learning" (Pellegrino, 2017). Pellegrino (2017, p. 229) makes the case that "deeper learning does not neglect learning of disciplinary content, but enables understanding of when, how and why to apply knowledge.

THE THREE-STREAM MODEL



Slide 4, which sets out the brief, poses seven questions. Here two are highlighted and briefly discussed

"How will the three-stream model give effect to this?" (this refers to "skills for a changing world", mentioned at the onset of the brief). (2) How will entrepreneurship and the Fourth Industrial Revolution be integrated into the curriculum?
It is indicated in slide 9 that a task team has been established to take the three stream model forward.

It is indicated in slide 9 that a task team has been established to take the three stream model forward.
Comment: The position paper commissioned by the Economic Task Team of the National Planning Commission, "Education and skills for the economy and links to labour markets in South Africa" (Van der Berg, Gustafson & Malindi, 2020) refers to the three stream model in relation to providing "more so-called twenty-first century skills to youths" (p. viii) and the Fourth Industrial Revolution. However, not much is known about the way forward with the three streams model.

ENTREPRENEURSHIP

The question "How will entrepreneurship and the Fourth Industrial Revolution be integrated into the curriculum?" is addressed in slides 13 and 14. Slide 13 addresses entrepreneurship and slide 14 highlights ICTs and digital skills.

Slide 13 refers to the IBE competence framework that was adopted and that "The Entrepreneurship Framework" was adopted in 2018. According to the DBE (2019) the E3 (Entrepreneurship, Employability and Education) initiative is the result of key country strategies, including the National Development Plan (NDP) which identifies education as being central to enhancing the entrepreneurial capacity of the nation. The NDP (2012:469) states that courses should be designed, introduced and taught to promote and instil a culture of entrepreneurship in society.

Dr Mamiki Maboya, Deputy Director-General for Curriculum Policy, Support and Monitoring said the following about the initiative (DBE., 2019):

"Our value proposition is that we provide the platform for all education initiatives working with DBE schools who are striving to bring 21st Century skills into the pedagogy. Included in this process is the need for all learners to develop curious, enquiring, empathetic minds

They will do this in every subject by being encouraged by the teacher to conceptualize a need, develop a solution and design a project that meets the needs of their environment and that fulfils a purpose within themselves. Teachers will create the opportunities for fun and fascination and provide the direction and guidelines for the 3 stages of conceptualization, process and project outcome. From a young age learners will grow their empathy, become caring, and develop a continuous problem-solving mindset that is driven by what they care about".

- The 2019 DBE statement indicated that the E3 initiative commenced during 2018 with 73 pilot schools using project-based learning methodologies to unlock an entrepreneurial mindset, provide iterative, reflective learning opportunities and develop 21st century learning skills and competences.
- The roll-out was planned to continue in 2019 and to include a further 180 schools over the next three years. The pilot could not continue as planned in 2020 due to the Covid-19 pandemic. The vision is to roll out "these learning methodologies" (DBE, 2019) to all schools, in all subjects and all grades.
- E3 has a mandate to reach 24000 schools by 2024. In 2018 E3 reached 78 schools, 332 in 2019. It was due to reach 600 in 2020 but due to the COVID-19 pandemic this has been rolled over to 2021 when the goal is to reach 3600.

The Covid-19 challenges gave rise to using a tech platform, called TeacherConnect through WhatsApp to engage with the programme's master trainers and teachers. E3 will revert to a combination of technology and face-to-face interaction once access is "normalized".
Comment: Here is a solid thoughtfully designed initiative that seems to be well-managed and which is progressing well.

FOURTH INDUSTRIAL REVOLUTION

Slide 14 addresses the question "How will entrepreneurship and the Fourth Industrial Revolution be integrated into the curriculum?" by indicating the prioritisation of ICTs and innovation, a programming language and introducing new subjects like Robotics and Coding, Entrepreneurship, Marine Sciences, Aviation, etc . The slide indicates that the DBE has developed a Framework for the development of the Curriculum for Digital Skills that included Coding and Robotics. A rather ambitious timeframe is indicated – the writing of the Coding and Robotics Curriculum for Grades R-9 commenced on 24th – 30th March 2019 and Curriculum for Grade R-3 was completed, and Grade 4-9 will be completed in June 2019.

- Comment: It is not clear whether the Framework for the development of the Curriculum for Digital Skills has been finalised and whether it is widely available. Also – the dates mentioned in the slides in relation to Robotics and Coding, had not been adhered to. As indicated, these dates were quite ambitious and the question arises about the urgency that is implicitly communicated in this slide. Proper curriculum development takes time.

Minister Motshekga indicated recently (22 July 2020) that "at the heart of the post Covid-19 basic education roadmap is the elimination of the digital divide by ensuring that all schools and education offices have access to the internet and free data." The urgency of this has indeed been foregrounded by the pandemic.

Recently (22 July 2020) the Minister of Basic Education said that the Coding and Robotics Curriculum for Grades R-9 has been developed. It was in the process of being repackaged to ensure proper sequencing and seamless progression from one phase to the next.

The plan was that the repackaging process would be completed by the end of July 2020; after which the curriculum would be presented to Umalusi for approval. The Minister indicated that training for teachers and subject advisors will be conducted online, because of the COVID- 19 pandemic. Coding and Robotics would be introduced in Grades R to 3 in 200 schools (2021), with a plan to implement fully by 2022. https://pmg.org.za/tabled-committee-report/4152/ 20 May 2020

Comment: How feasible is the full implementation in 2022, given the Covid-19 context which will most probably impact schooling for at least 2021 and with longer term ramifications?

TEACHER DEVELOPMENT

- The notion of teacher development is addressed in more than one slide, e.g. slide 15 and 25. In slide 15 it is stated "Pre-service curriculum as well as Professional Teacher Development should consider providing teacher development programmes that enable teachers to teach at a level of creative thinking, problem solving and other skills".

  Comment: How will this teacher development take place? What will it involve? A recommendation in slide 15 is to provide support to teachers (e.g. scripted lessons, materials support, etc.) for teachers to infuse the relevant breadth of skills in their teaching and assessment. Though scripted lessons are provided as an example, the question arises about expertise and capacity to develop lessons that infuse the relevant breadth of competencies.

And which grades are referred to here? The system has already had some success with scripted lessons. However, many are of the view that scripted lessons are useful as examples of good practice or are useful in the short term to support learning in schools. However, the jury is out on the effectiveness of scripted lessons for development of teacher competence in the long term.

The question also arises how susceptible in-service teachers will be for development activities during the pandemic and post-pandemic when energies will be occupied mainly by catching up due to the loss of teaching and learning time in schools. Functioning in survival mode is not conducive to learning and development.

RECOMMENDATIONS

1 Clarity on nomenclature and the need to have a working definition of competencies for the SA context

The 22 July statement of the Minister of Basic Education referred to earlier https://pmg.org.za/briefing/30767/ uses the nomenclature "skills and competencies for a changing world." Is this now the accepted nomenclature within the DBE? And if so, is there a widely shared understanding on how the terms skills and competencies are used? As was noted earlier – different meanings are attached to these terms in different frameworks and contexts.

- Furthermore – how does the notion of "skills and competencies for a changing world" account for the literacies that are deemed important for a changing world, e.g. digital literacy, information literacy and science literacy or is the assumption that the notion of skills and competencies for a changing world include these?

- The significance of some of these literacies has been underscored by the Covid-19 pandemic. A World Economic Forum Covid Action Platform posting (13 August 2020) claims that many of the problems resulting from the COVID-19 crisis are related to a lack of science literacy. We have come to realize how understanding science has "tangible, practical, and immediate applications" for our daily lives.

The case is made that science literacy must be included in the basic definition of literacy to enable the next generation to address global challenges, also to counteract the denial of scientific knowledge and to actively fight misinformation. https://www.weforum.org/agenda/2020/08/science-education-reset-stem-technology/

The Covid 19-crisis also underlined, e.g. the need for information literacy – to understand the difference between trustworthy information and invalid information on the internet and in social media.

Clarity on nomenclature and what specific terms denote and include is important because nomenclature inadvertently steers thinking, conversation, and practice. The need for consistency of language, concept, construct and content" is also highlighted in the IBE Framework of future competences (Marope, Griffin, & Gallagher, 2019, p. 25).

2 Connecting the foci of the fourth industrial revolution and competencies for a changing world

- The foci on the fourth industrial revolution and competencies for a changing world seem to be dealt with somewhat independently. When the notion of 4IR is highlighted in relation to the curriculum the emphasis is placed on ICTs and digital skills, a programming language and introduction of new subjects. The connection between 4IR and competencies required for a changing world is not made explicitly as it is the case in the international literature. This could result in silo thinking and practice, which should be avoided.

3 rity on the role of the IBE Framework of future competences

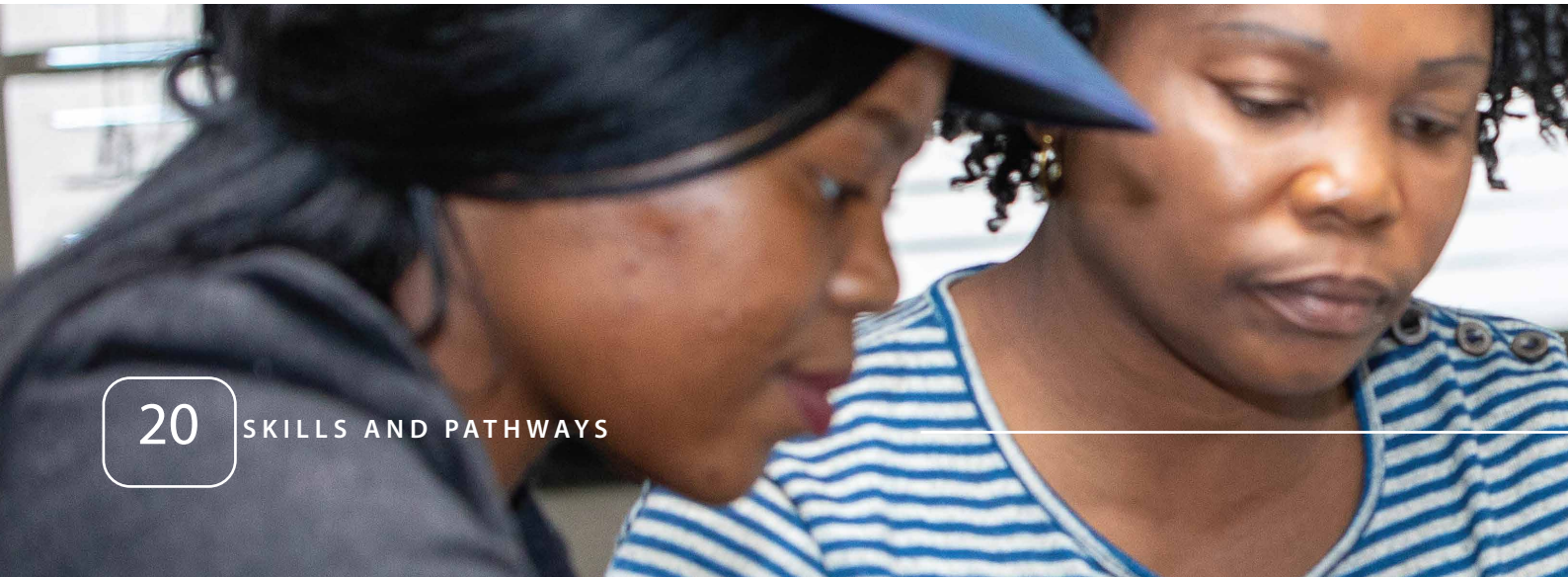
- The point was made earlier that according to Minister Motshekga the vision of basic education, post-Covid 19, "is anchored on the immediate implementation of a curriculum with skills and competencies for a changing world." That being the case, clarity is required on what exactly the role of the IBE Framework of future competences are in this respect.

  It does not seem that a fully-fledged competence-based curriculum as is described in the IBE Framework is envisaged – structuring the curriculum around competences and not around subjects. Furthermore, the IBE Framework does not purport to be a "skills and competency" framework. That being the case, what is then the role of the IBE Framework of future competences in relation to the post-Covid 19 curriculum vision?

4 Leapfrogging and continued emphasis on the foundational literacies

- The documents that this paper draws do not make a direct link between preparing young people for 4IR, skills and competencies for a changing world and the foundational literacies. This does not mean that this link is not made elsewhere, or that these are not foregrounded by the DBE. They have been and remain prominent in DBE plans.

For example, Minister Motshekga has recently again highlighted the importance of improving foundational skills of Numeracy and Literacy, especially reading, which should be underpinned by a reading revolution. https://pmg.org.za/tabled-committee-report/4152/ 20 May 2020. She also noted that every 10 year-old needs to be able to read with meaning – and she noted that early reading programmes are gathering momentum. https://pmg.org.za/tabled-committee-report/4152/



Nevertheless, it is important to highlight these foundational literacies as integral to a "focus on skills and competencies for a changing world" because of their fundamental nature. They form the foundation for success in education.

Some say that the focus should be on getting the basics right – Reading, wRiting, and aRithmetic, the so-called 3Rs, particularly in the early years of schooling. They contend that we do not have the luxury to divert attention to competencies for a changing world. South African children can't read and do basic maths!

A counterargument is first, that the foundational literacies are integral to competencies for a changing world because they are foundational. So, there is no need to juxtapose foundational literacies and competencies for a changing world. And secondly, foregrounding the foundational literacies does not need to preclude cultivating other competencies that children will need to negotiate the changing world. Indeed, children may acquire basic literacies more effectively in an education environment that nurtures for example, the 4Cs – critical thinking, communication, collaboration and creativity.

Here the notion of 'leapfrogging' is pertinent, which implies "any practices, both new and old, that can address skills inequality and skills uncertainty at the same time" (Winthrop, 2018, p. 5). Leapfrogging breaks from the well-established logic of prioritizing, first, access to school; second, academic quality; and third, real-world relevance" (p. 5). Competencies for a changing world could and should be intentionally developed in conjunction with the development of foundational literacies.

A recommendation from the position paper commissioned by the Economic Task Team of the National Planning Commission, "Education and skills for the economy and links to labour markets in South Africa" (Van der Berg, Gustafson & Malindi, 2020) is also relevant here. The case is made for stimulating the debate on how best to improve and monitor reading in the early grades. Important South African research, largely driven by government, has been conducted on how to teach reading better in primary schools. However according to Van der Berg, Gustafson & Malindi (2020) the uptake of this research is still insufficient, judging for instance from the annual plans of some provincial education departments.

5 Clarity on the way forward on teacher education and development for a changing world

- The "Minimum Requirements for Teacher Education Qualifications" (MRTEQ) highlights the changing world in relation to the fourth industrial revolution and 21st century skills/competencies and it is expected that teacher education institutions (TEIs) will prepare student teachers to teach in this world.

  To what extent this is happening at all TEIs is not clear. Nevertheless, it is assumed that this will gain momentum once the school curriculum exhibits this focus. It is therefore important that there should be ongoing conversation between the DBE and TEIs about the proposed changes in the school curriculum as was noted in the Minister's vision for a post-Covid curriculum.

The success of curriculum implementation depends on a capacitated teacher corps as well as support structures (e.g. Districts). The National Institute for Curriculum and Professional Development (NICPD) was established as a chief directorate in the Department of Basic Education in 2014. However, the NICPD has not been fully capacitated yet. The September 2020 discussion document "Institutionalising the NICPD" is promising. It indicates that the primary focus of the NICPD is professional development. It will however keep curriculum implementation and delivery in sharp focus to identify gaps, trends and new ways of teaching.

- It stands to reason that there should be close cooperation between the DBE division that deals with curriculum development and the NICPD and that teacher development – foci and delivery modes – should be planned in tandem with the curriculum change/development process and not as an afterthought.

  Drawing on international experiences a blended approach to teacher development in relation to the envisaged post-Covid curriculum may be the best way forward.

6 Greater clarity on the three-streams curriculum model

- According to Minister Motshekga, there was progress with the introduction of the three-stream curriculum model. https://pmg.org.za/tabled-committee-report/4152/ 20 May 2020

  However, no detail is provided. The position paper commissioned by the Economic Task Team of the National Planning Commission, "Education and skills for the economy and links to labour markets in South Africa" (Van der Berg, Gustafson & Malindi, 2020) notes that this initiative could easily represent the most ambitious post-1994 reform in the schooling sector. It is indicated that presentations on the proposed model have been made but there is thus far no formal and national policy in the public domain.

7 Greater clarity on new subjects such as Robotics, Coding Entrepreneurship, Marine Sciences, Aviation, etc.

- Clarity is required on the way forward with new subjects, such as Robotics, Coding Entrepreneurship, Marine Sciences, Aviation, etc.

  The Minister of Basic Education said (22 July 2020) that the Coding and Robotics Curriculum for Grades R-9 has been developed. It was in the process of being repackaged to ensure proper sequencing and progression from one phase to the next. The plan was that the repackaging process would be completed by the end of July 2020; after which the curriculum would be presented to Umalusi for approval. The Minister indicated that training for teachers and subject advisors will be conducted online, because of the COVID- 19 pandemic.

Coding and Robotics would be introduced in Grades R to 3 in 200 schools (2021), with a plan to implement fully by 2022. https://pmg.org.za/tabled-committee-report/4152/ 20 May 2020

Comment: How feasible is the full implementation in 2022, given the Covid-19 context which will most probably impact schooling for at least 2021 and with longer term ramifications. Though it is not indeed possible to train teachers and subject coordinators online, how susceptible will the majority of teachers be for training during a time of high stress and with a focus in schools on catching up lost teaching time?

Greater clarity on new subjects such as Robotics, Coding Entrepreneurship, Marine Sciences, Aviation, etc.

- The E3 initiative is currently a pilot (until 2021) and recommendations will be made to the DBE for further implementation based on a comprehensive monitoring and evaluation study.

  One of the reasons for success of E3 is likely because its roll-out is within the CAPS. This means that no extra load is put on teachers. The CAPS requires a project in the third term anyway. This probably contributed to getting buy-in from and traction with the teachers. Another reason is that the project-based learning (PBL) approach used by E3 has been proven successful in numerous countries and schools around the world. E3 drew on the international experience and literature in conceptualising the project.

  The approach of thorough planning and piloting done for this project is noteworthy and it may be wise to follow a similar approach for other innovations/renewals in the curriculum.

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Annexure 1: Summary/ graphical representations of some of the 21st century education frameworks

Source: Pellegrino, J.W. and M.L. Hilton (eds.) (2012), Education for Life and Work: Developing Transferable Knowledge and Skills in the Twenty-First Century, National Academies Press, Washington, DC.

1 Cognitive Skills

Processing and cognitive strategies

Critical thinking.
Problem solving.
Analysis.
Logical reasoning.
Interpretation.
Decision making.
Executive functioning.

Knowledge

Literacy and communication skills.
Active listening skills.
Knowledge of all disciplines.
Ability to use evidence and assess biases in information.
Digital Literacy.

Creativity

Creativity
Innovation

2 Interpersonal Skills

Collaborative group skills

Communication.
Collaboration.
Team Work.
Cooperation.
Coordination.
Empathy, perspective taking.
Trust.
Service Orientation.
Conflict Resolution.
Negotiation.

Leadership

Leadership
Responsibility
Assertive communication
Self-Presentation
Social influence

3 Intrapersonal Skills

Intellectual openness

Flexibility.
Adaptability.
Artistic and cultural appreciation.
Personal and social responsibility.
Intercultural competency.
Appreciation for diversity.
Capacity for lifelong learning.
Intellectual interest and curiosity.

Leadership

Initiative
Self-direction
Responsibility
Perseverance
Productivity
Persistence
Self-Regulation
Meta-cognitive skills, anticipate future, reflexive skills
Professionalism
Ethics
Integrity
Citizenship
Work Orientation

Creativity

Self-regulation (self-monitoring and self-assessment)
Physical and mental health

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