Fourth Industrial Revolution – Future-Fit Graduates

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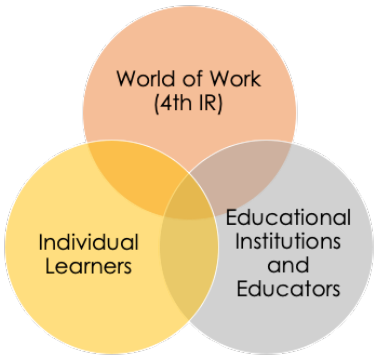
Introduction

In this short article, some perspectives will be shared specifically on the role of educational institutions and educators in preparing individual learners for the future word of work. What is suggested in the diagram is the point however that addressing the challenges of employment and employability is not an educational challenge only, but is one that can only be addressed through mindful collaboration with individual learners as well as institutions and enterprises representing the world of work.



With the movement towards digitalisation, machine learning and artificial intelligence gathering momentum in the past decade or so, the disruptive impact of these changes on both people and business are becoming more visible, and the exponential growth in the impact of technology compels us to contemplate new visions how our future lives and work will be organised. There is a shift not only in the kind of workforce talent that is required, but also in the kind of skills and competence that will be needed in the 21st century. It is suggested that by 2020 the Fourth industrial Revolution (4th IR) will bring us advanced robotics and autonomous transport, artificial intelligence and machine learning, advanced materials, biotechnology and genomics, but also a change in importance in up to one third of skills that are today deemed as important (World Economic Forum, 2016).

Educational Response

While these technologies promise progress and future growth, they also raise real challenges for educators who have to respond to a world where some professions are being eradicated, while others are emerging that require entirely new competences and capabilities. What makes it even more challenging is that the rate and pace of change, require new competencies and skill sets to be developed very rapidly, almost simultaneously, in response to changes as they emerge.

This rate of change also means that we can no longer approach disruptive change through comprehensive reskilling and large-scale education efforts as in the past, because the development of new skills and competence

takes too much time. This also means that educators can no longer simply focus on training highly relevant individuals based on knowledge production and research as in the past.

Dr Nancy Gleason, editor of *Higher Education in the Era of the Fourth Industrial Revolution*, suggests that significant talent gaps in the global work force is not a result of a skills gap, but of a learning cognition gap. She believes that instead of the skills gap, it is the cognition gap that should be addressed by educators. The question that arises then is not what the competences and skills are that will be required in the 4th IR world of work, but rather how we can bridge the learning cognition gap to prepare learners for this challenging new world of work.

This means that we need to think differently about the purpose of education. Gleason (2018) suggests that the pedagogies of information transfer are not in keeping with a shift in focus away from content- based learning with its focus on what to learn instead of on how to learn with an interest and motivation for learning. This is the shift required to close the cognition gap according to Gleason (2018). Instead of a concern with specific competencies -that are dynamic and fleeting in nature- the focus should rather fall on agile learning as the core capability for developing relevant abilities in response to the human challenges posed by the Fourth Industrial Revolution.

Learning agility may be described as "the willingness and ability to learn from experience, and subsequently apply that learning to perform successfully under new or first-time conditions" (Lombardo & Eichinger, 2000). Agile learners are those that are able to learn from experience, apply their knowledge and skills to new situations, are passionate about continuous learning – and therefore contribute significantly to performance. As suggested by Lombardo & Eichinger (2000) learning agility incorporates aspects such as mental agility, people agility, change agility and results agility. Learning agility also seems to be related to three personal characteristics, namely resilience to instability, increased self-awareness and the ability to respond to complexity. Viewed from this perspective, agile learning may be a critical capability for responding to the disruptive challenges of 4th IR.

Gleason (2018) suggest that "adaptive, flexible minds will be the most employable in the future, as they will have the cognitive agility to keep up with the fast-paced shifts in workplace projects." According to Bidshahri (2018) we now need to focus on future fluencies like curiosity, imagination, judgement. The notion of the educator as subject expert and fount of knowledge and information is fast disappearing as educators instead have to embrace new roles as cross-curricular specialists, guides, counsellors, mentors, and facilitators (Bidshahri, 2018).

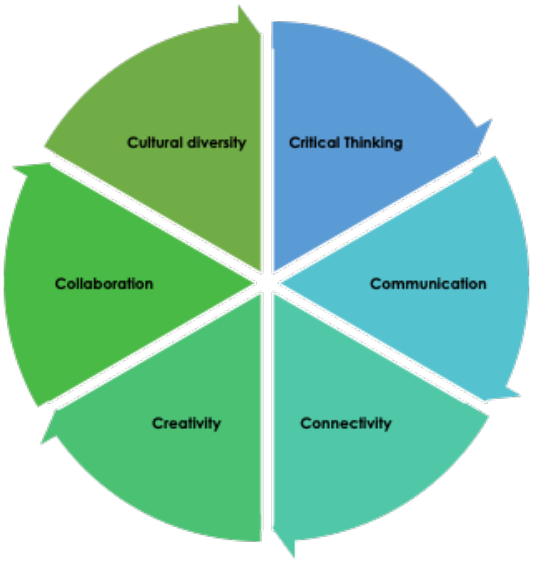
Educator Challenge

Clearly a shift towards agile learning requires reconsideration of how we as educators can achieve the requisite capacity to grapple with the challenges that are posed in 4th IR contexts, especially since access to learning opportunities do not appear to be the definitive requirement for developing agile learners. While competencies and skills can be developed through formal and informal education, training and development, capability is bounded by personal potential, although it can be enhanced through learning and experience. Gleason (2018) articulates this as an ability "to be cognitively agile and socially adept" in a world where "technological innovations replace human cognition in pattern-based tasks."

We therefore have to shift our focus away from trying to understand *what* competencies will be required in 4th IR contexts, toward an understanding of *how* we as educators can enhance the capability for agile learning in both youth and adult learners. For Gleason (2018) this means we should be focusing our efforts on shifting learners' mindsets to constant learning, comfort with change, and adaptability to new environments. This in turn requires that all disciplines encourage learners "to invent, create, discover and explore their role in contributing to a future-focused, transformative society where their research can lead to solutions to pressing societal needs" (Kupe, 2019).

These kinds of capabilities are closely aligned with the focus that Arts and Humanities has always claimed to develop in its formative disciplines that facilitate agile thinking and multi-perspective understanding of complex situations. It is also this focus that will assist in developing learner's flexibility and agility to adapt their behavior as situations change, and to build resilience for change in the face of the obsolescence and displacement that is envisioned in rapidly changing 4th IR contexts.

Findings suggests that providing learners with the opportunity to actively engage in and construct their own learning enhances concentration, motivation, and active learning (Kupe, 2019; Dzubak, 2015) What is required is learners that are capable of taking self-responsibility for their own learning and development, and that are actively engaged in their own learning. As educators we must move away from the content based factual approaches that have become the bedrock of our teaching and learning. We must move towards closing the learning cognition



gap through what Kupe (2019) refers to as mastering the six c's through thinking critically, communicating clearly, using connectivity, developing creativity, working collaboratively and embracing culture.

Final Thoughts

This is a particular challenge in the South African education context where increasing numbers of students are not sufficiently prepared for the rigors of higher education because of their inexperience with critical thinking and independent decision making (Dzubak, 2015). Quite often underprepared learners cannot contend with the demands of the workplace or community without first gaining significant additional work experience. The challenge to promote active learning is therefore so much greater, especially since active learning happens best in a one-on-one context or through self-learning (Spence, 2001). The challenge remains how we are going to actively engage these learners through the development of self-responsibility for their own learning if we are to prepare graduates that are future fit for the challenges of the 4th IR context.

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