APPENDIX

Being a student in the 21st century - an autoethnographic narrative

N.L. Broodryk

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDIX A: PRACTICE THEORY OF AND FOR FACILITATING LEARNING

The following figures represent my practice theory of and for facilitating learning.

Please note that for the first two figures (Figure 1 and Figure 2) the detail is not important, but these figures represent rather the holistic view of the hard labour that went into constructing the practice theory. The figures (Figure 3-Figure 13) following the holistic pictures, though, show the detail of the practice theory.

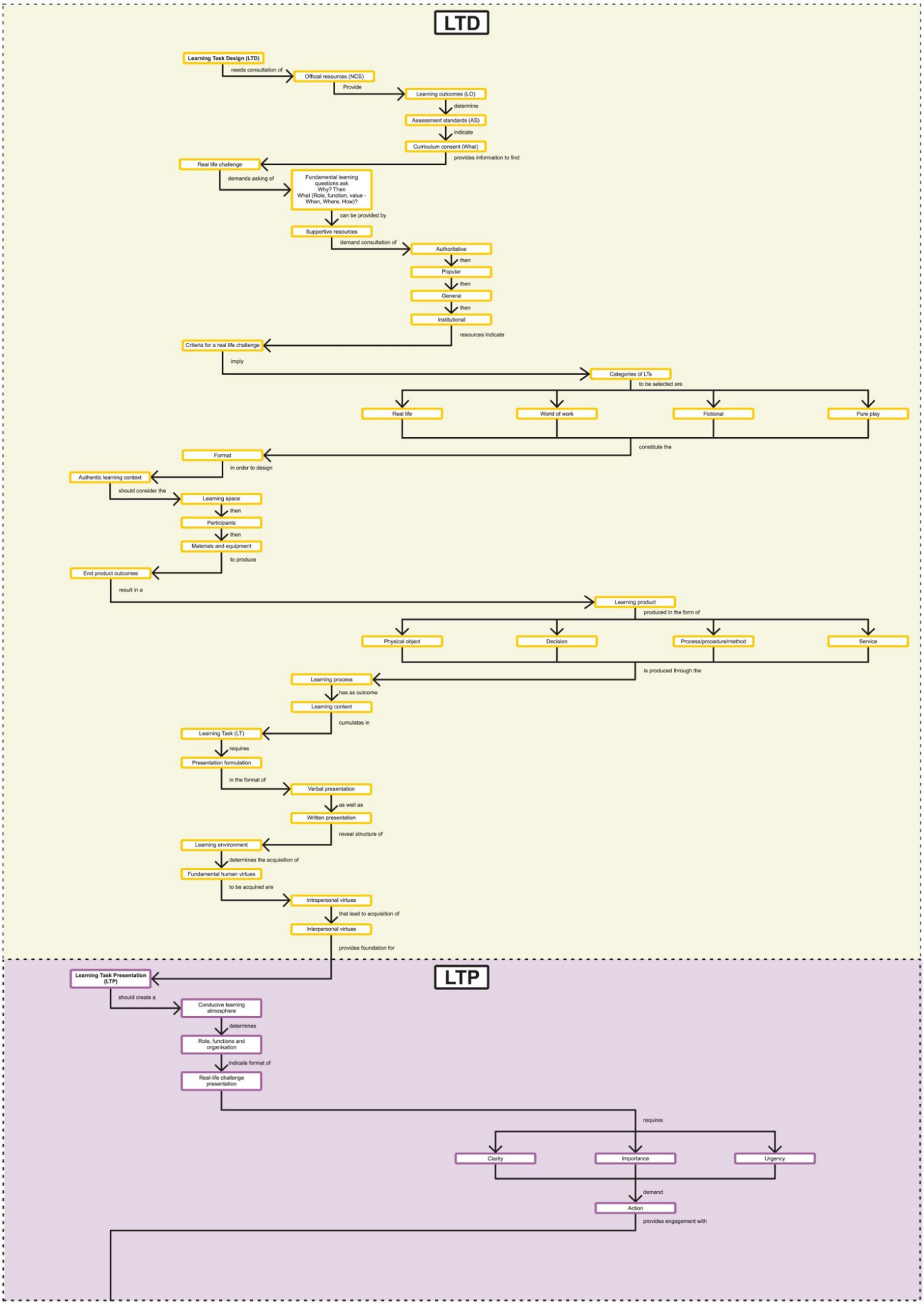

Figure 1: Practice theory of and for facilitating learning: Page 1

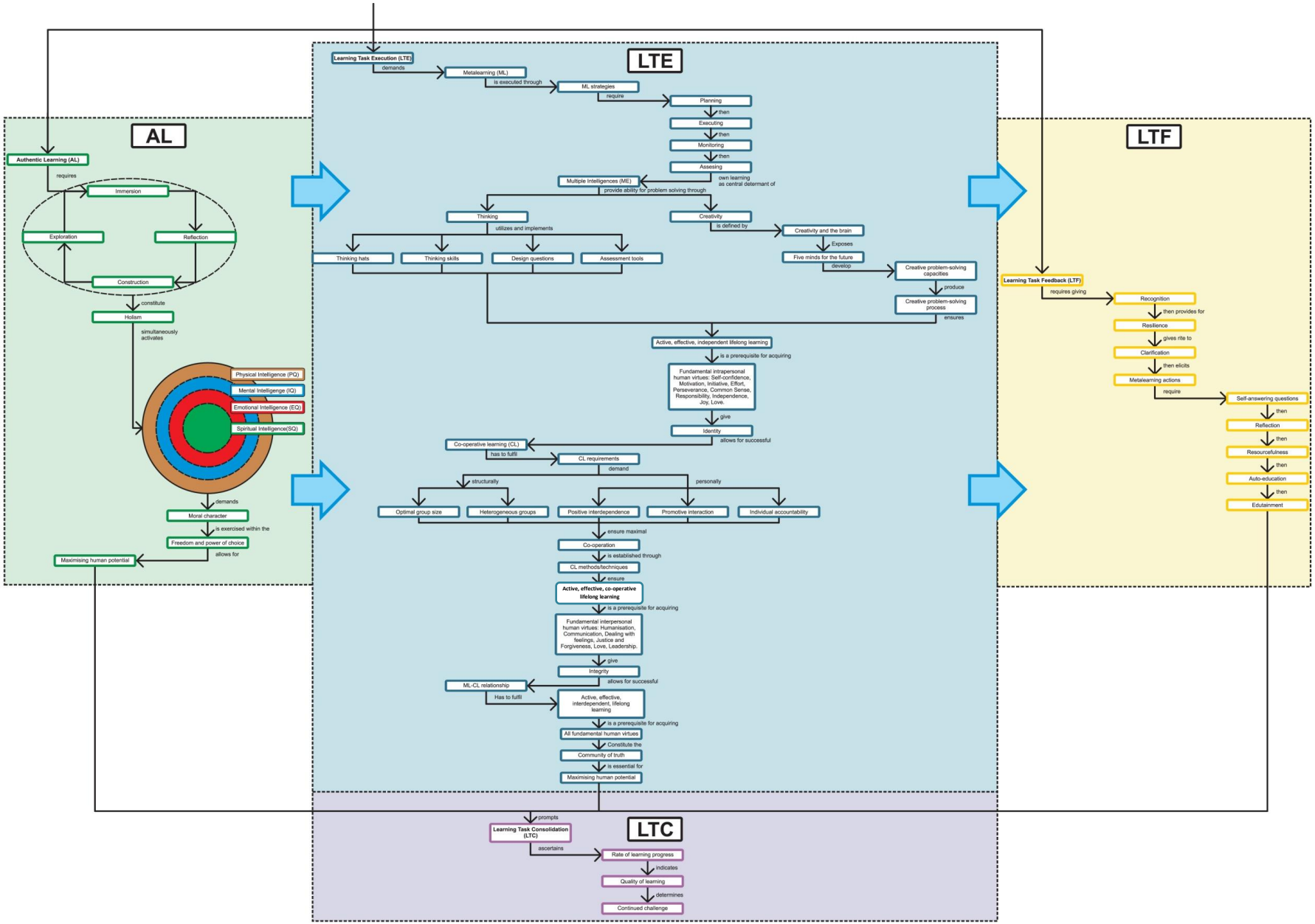

Figure 2: Practice theory of and for facilitating learning: Page 2

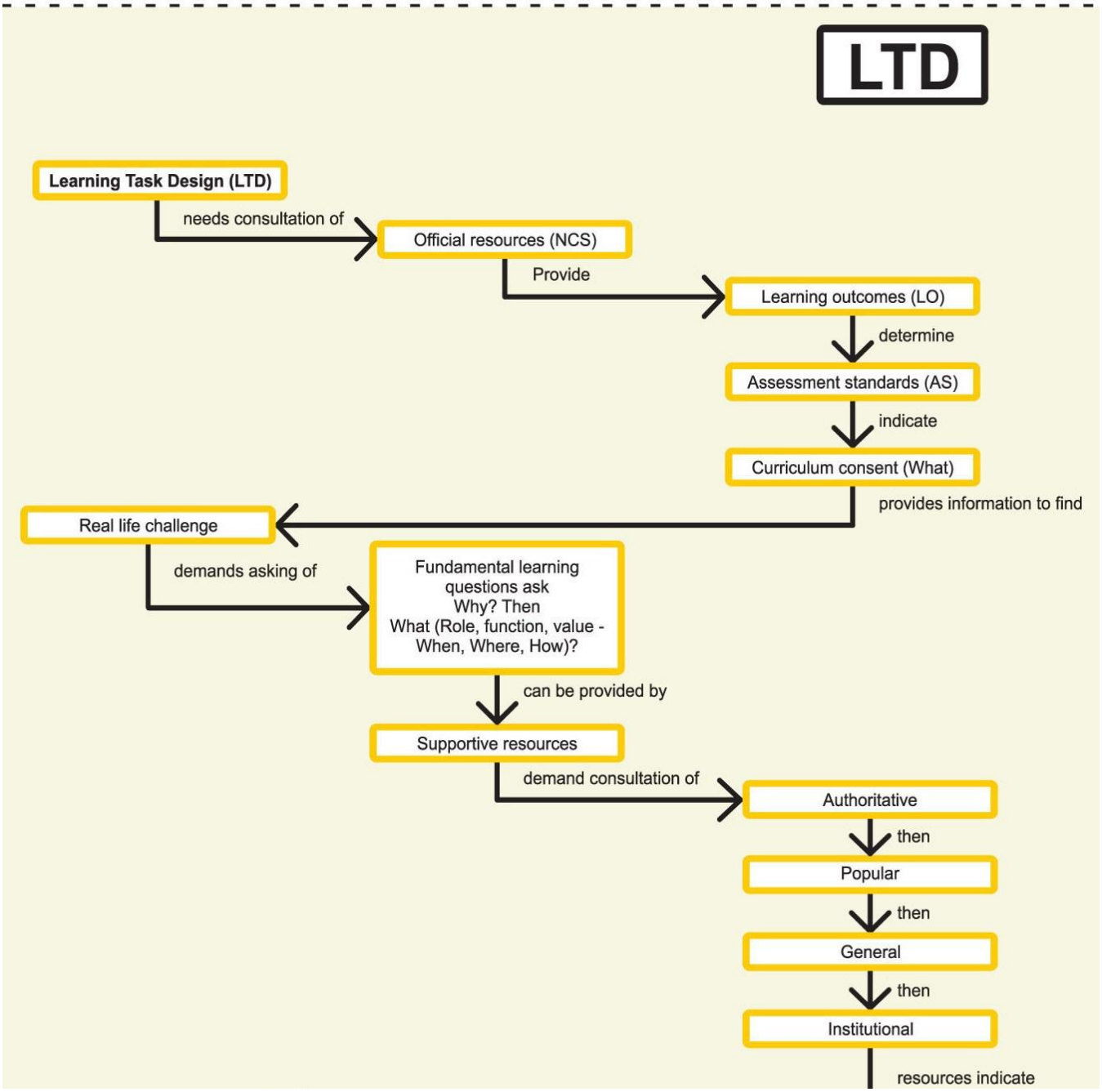

Figure 3: Practice theory of and for facilitating learning: LTD Part 1

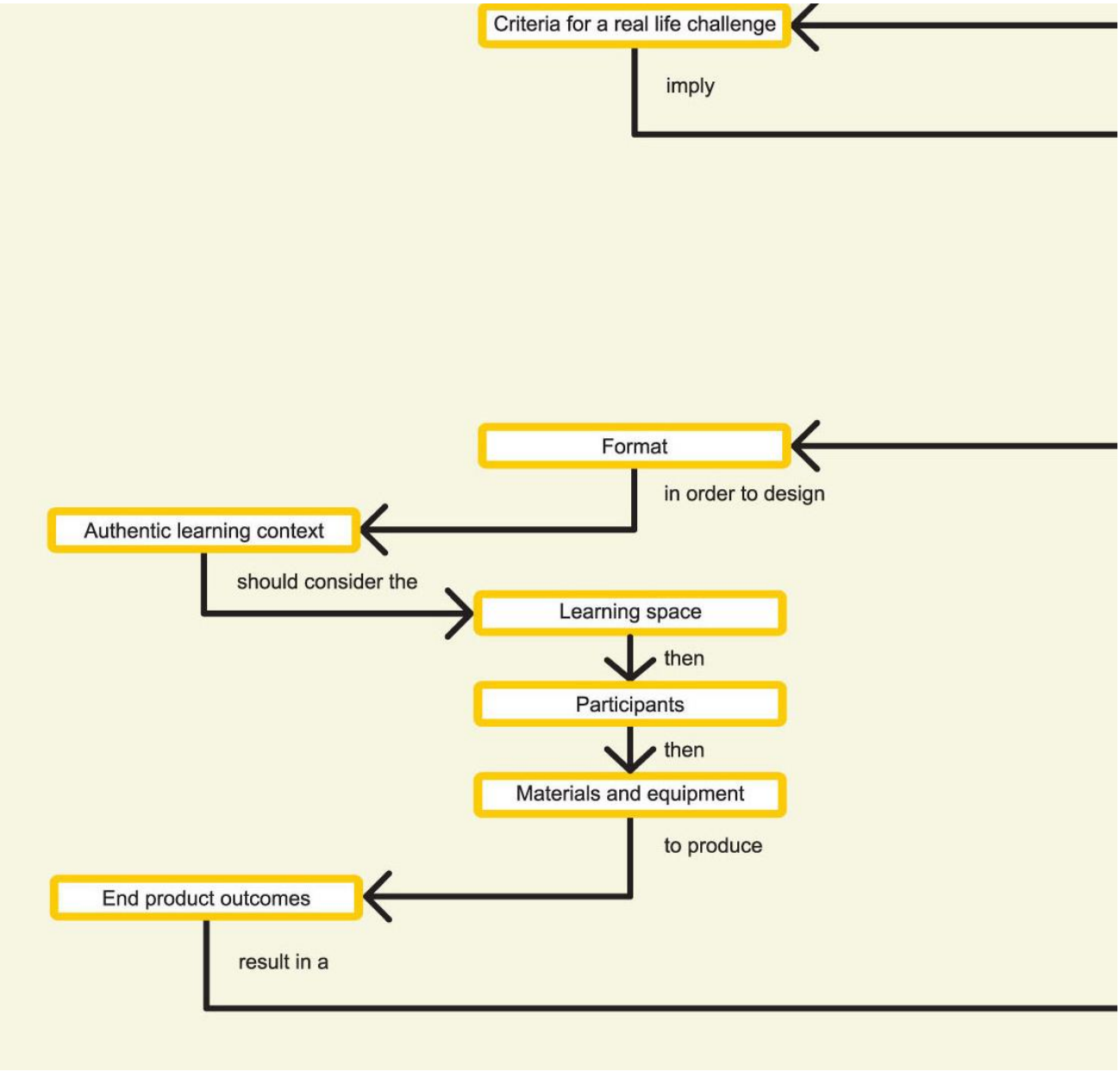

Figure 4: Practice theory of and for facilitating learning: LTD Part 2

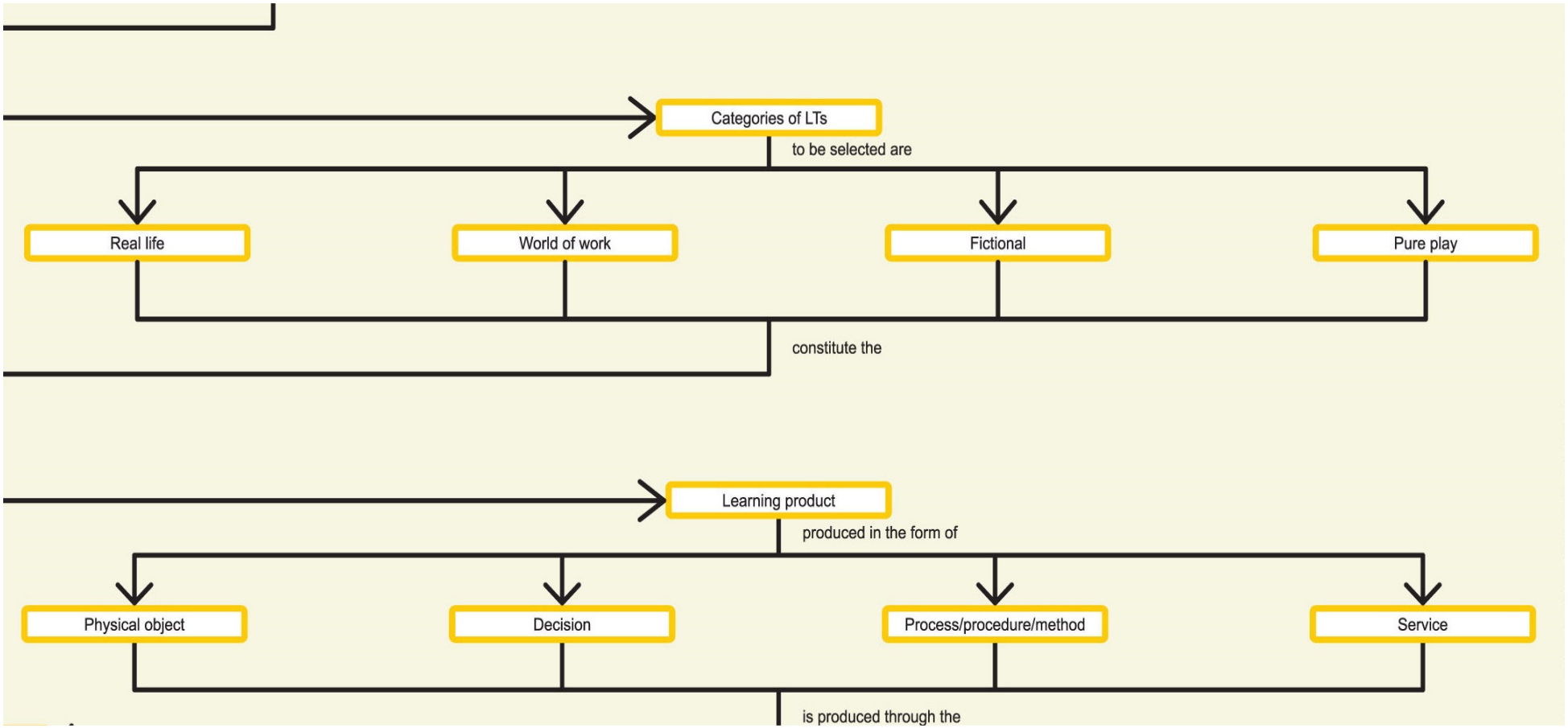

Figure 5: Practice theory of and for facilitating learning: LTD Part 3

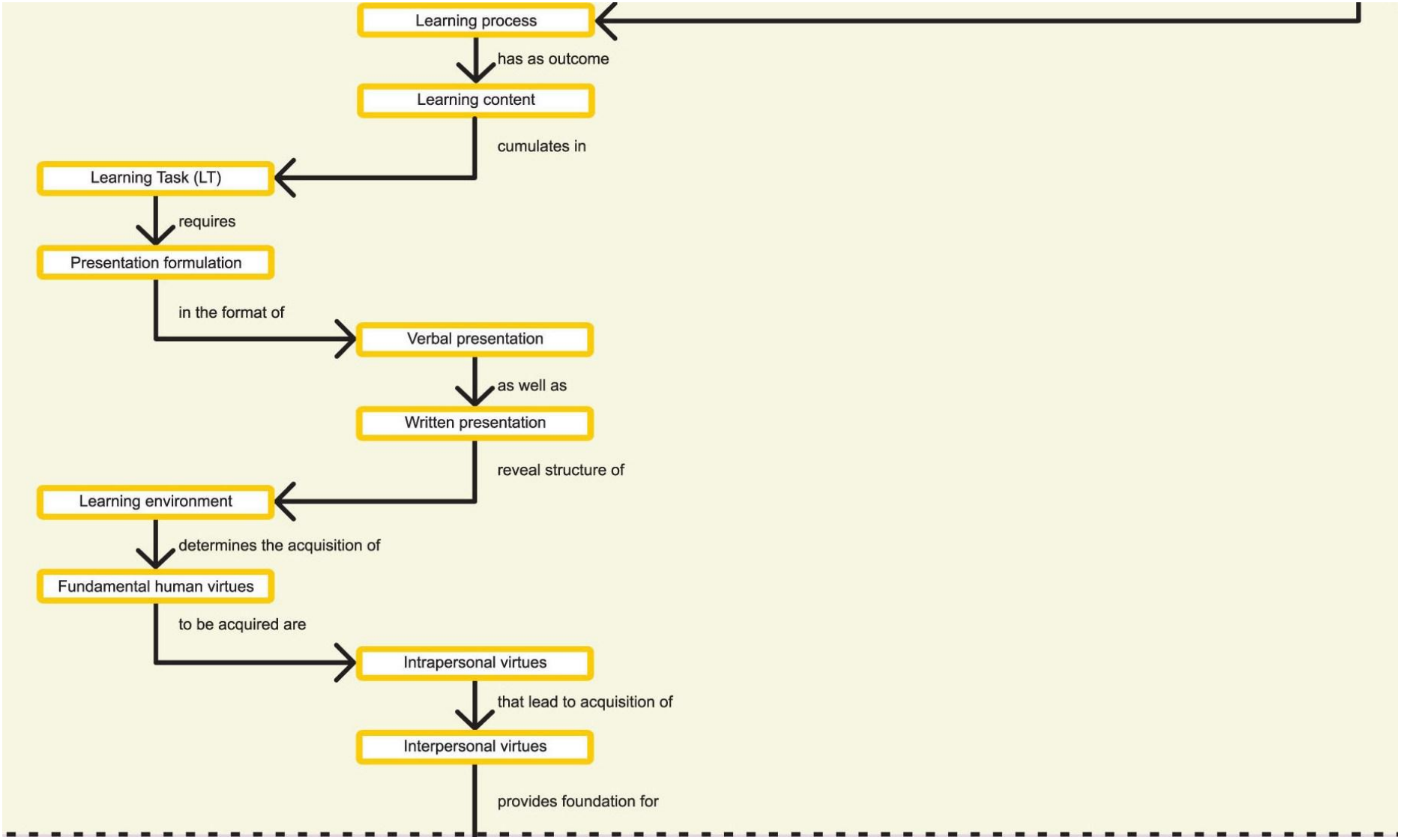

Figure 6: Practice theory of and for facilitating learning: LTD Part 4

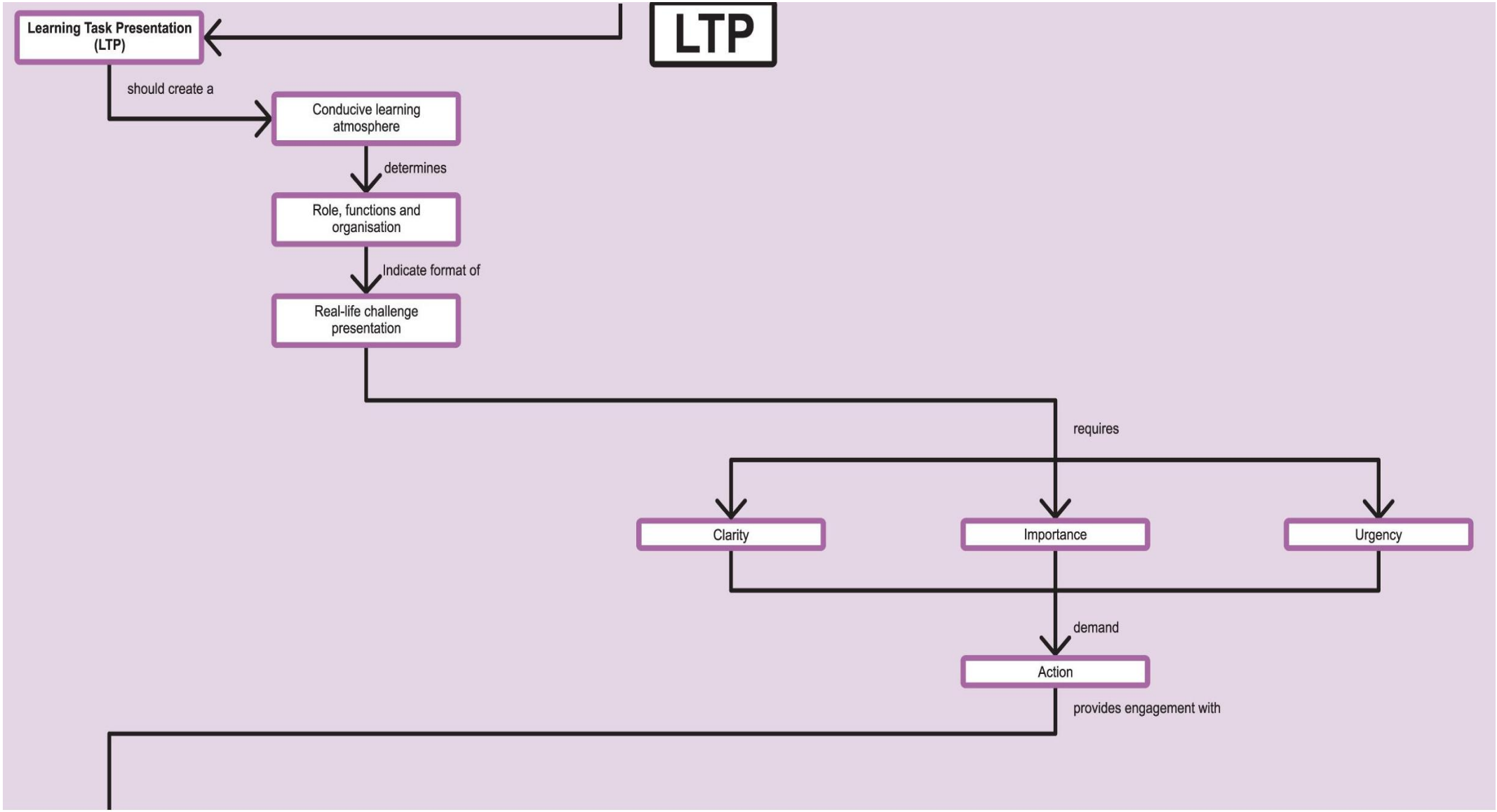

Figure 7: Practice theory of and for facilitating learning: LTP

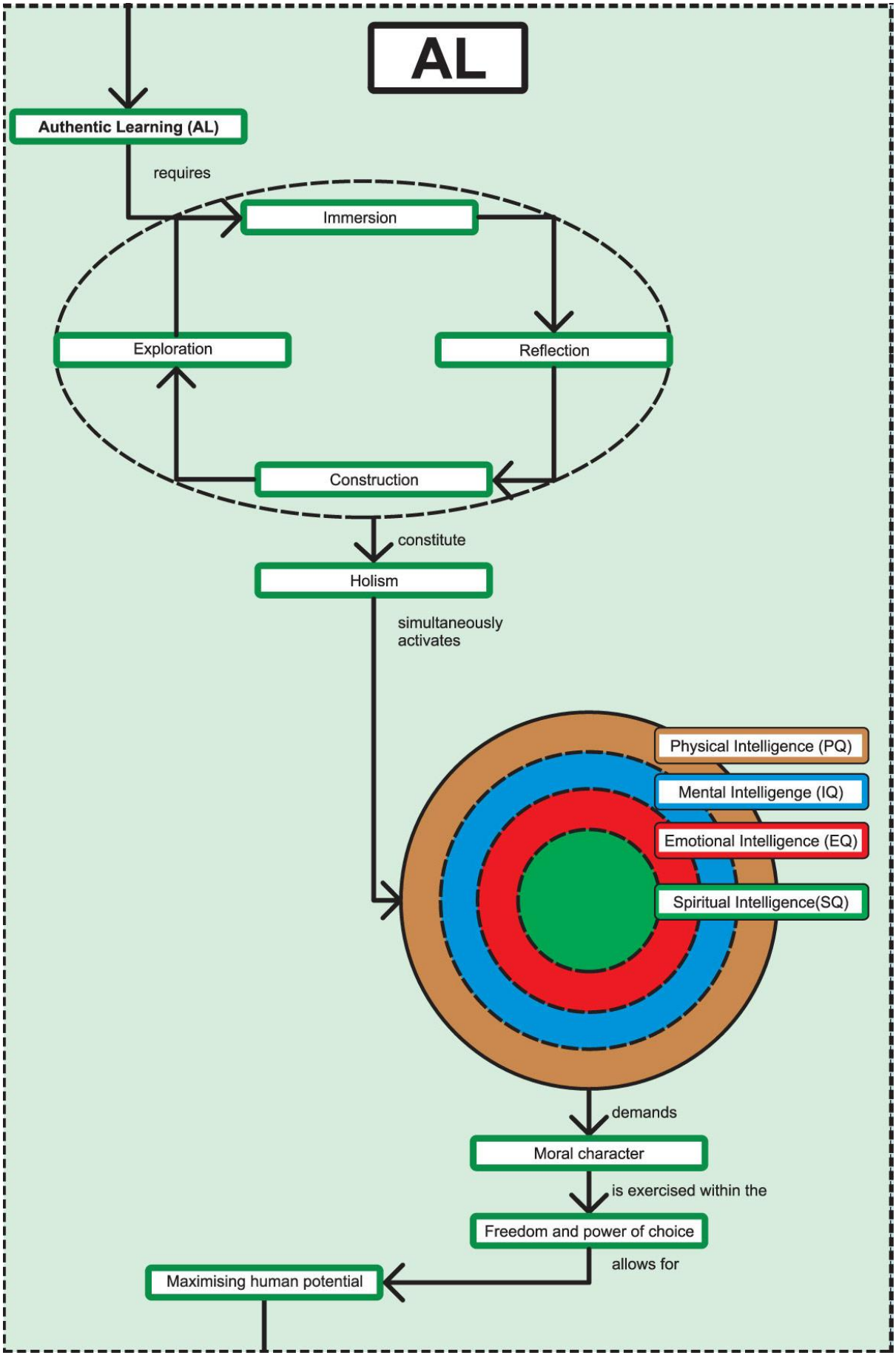

Figure 8: Practice theory of and for facilitating learning: AL

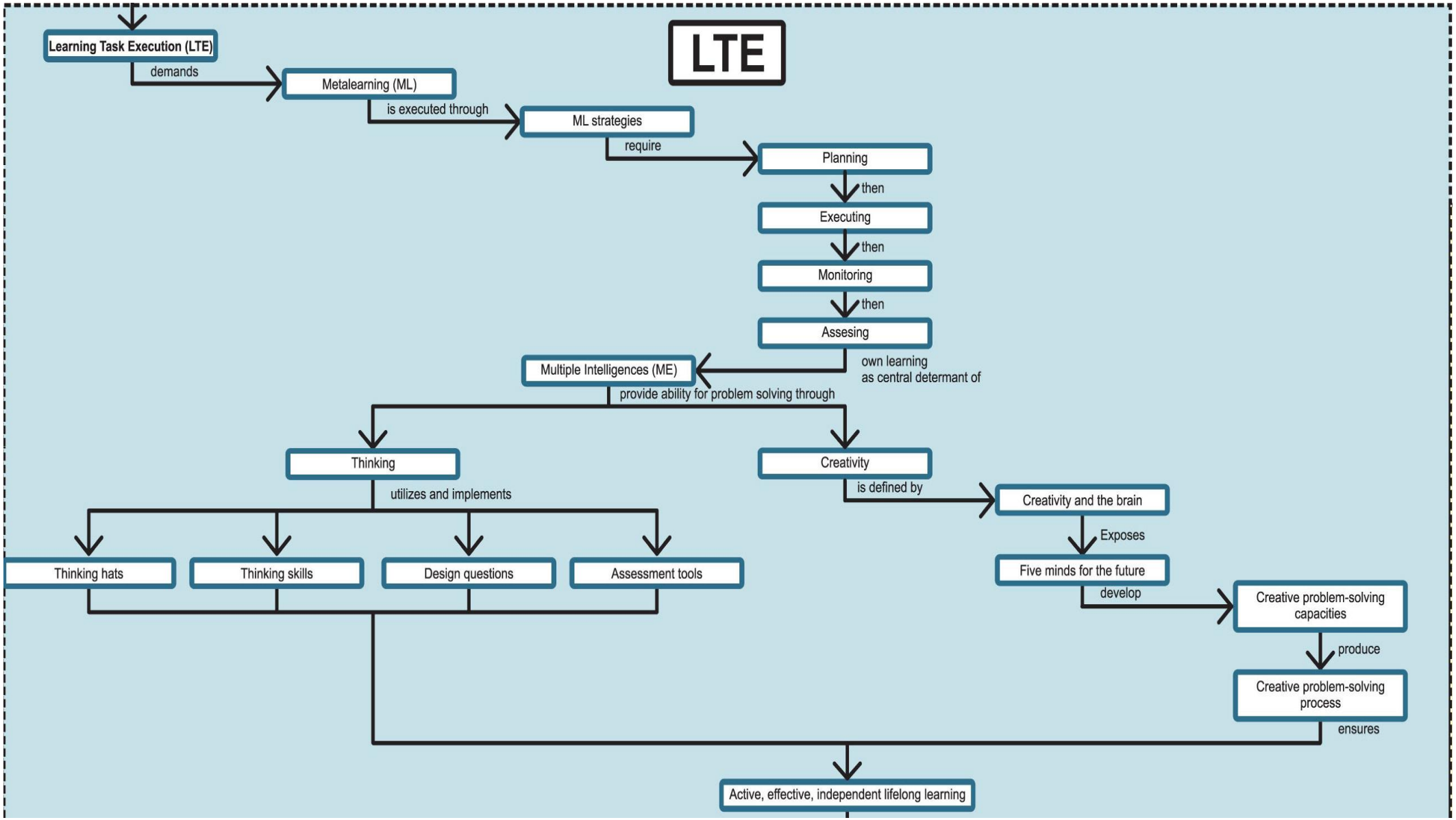

Figure 9: Practice theory of and for facilitating learning: LTE Part 1

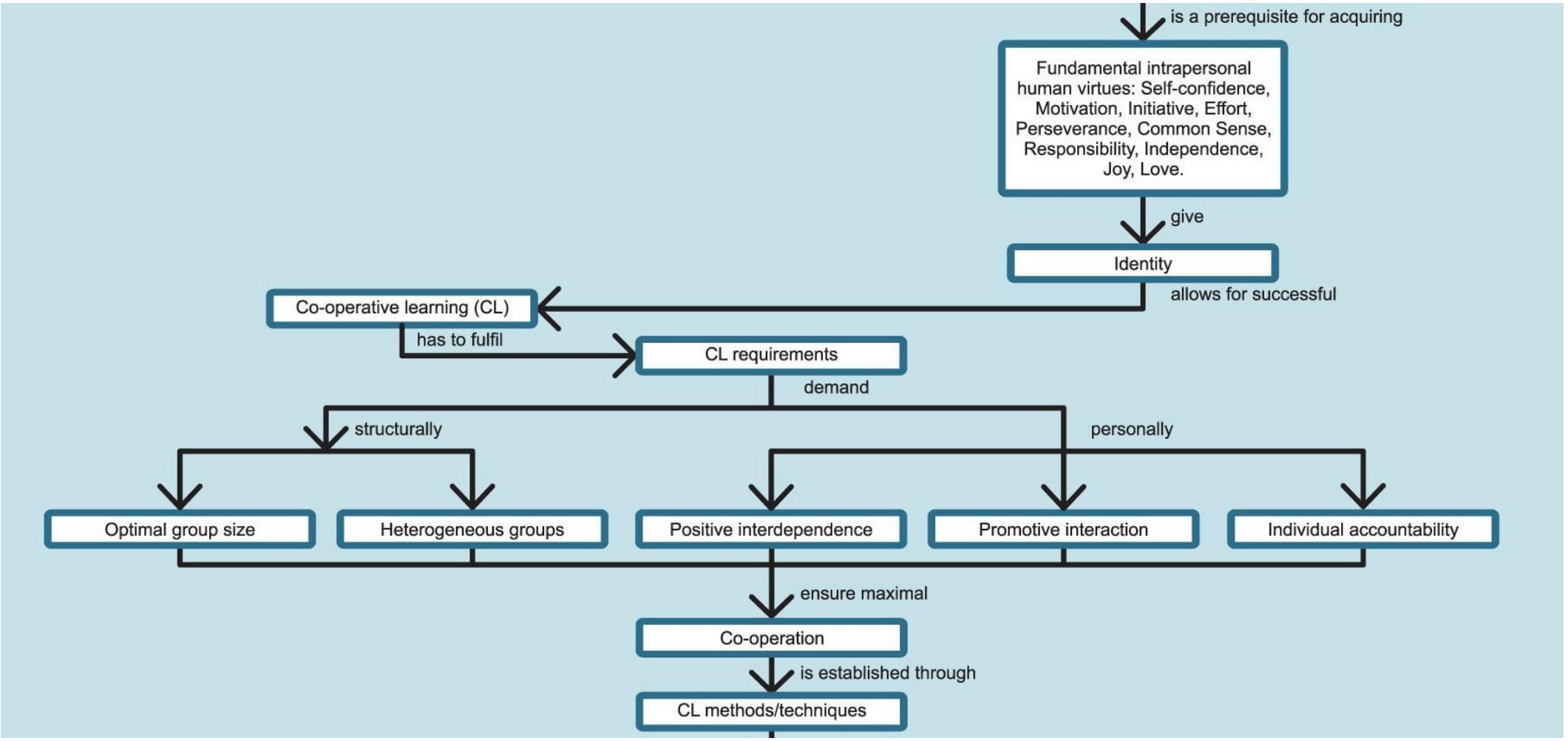

Figure 10: Practice theory of and for facilitating learning: LTE Part 2

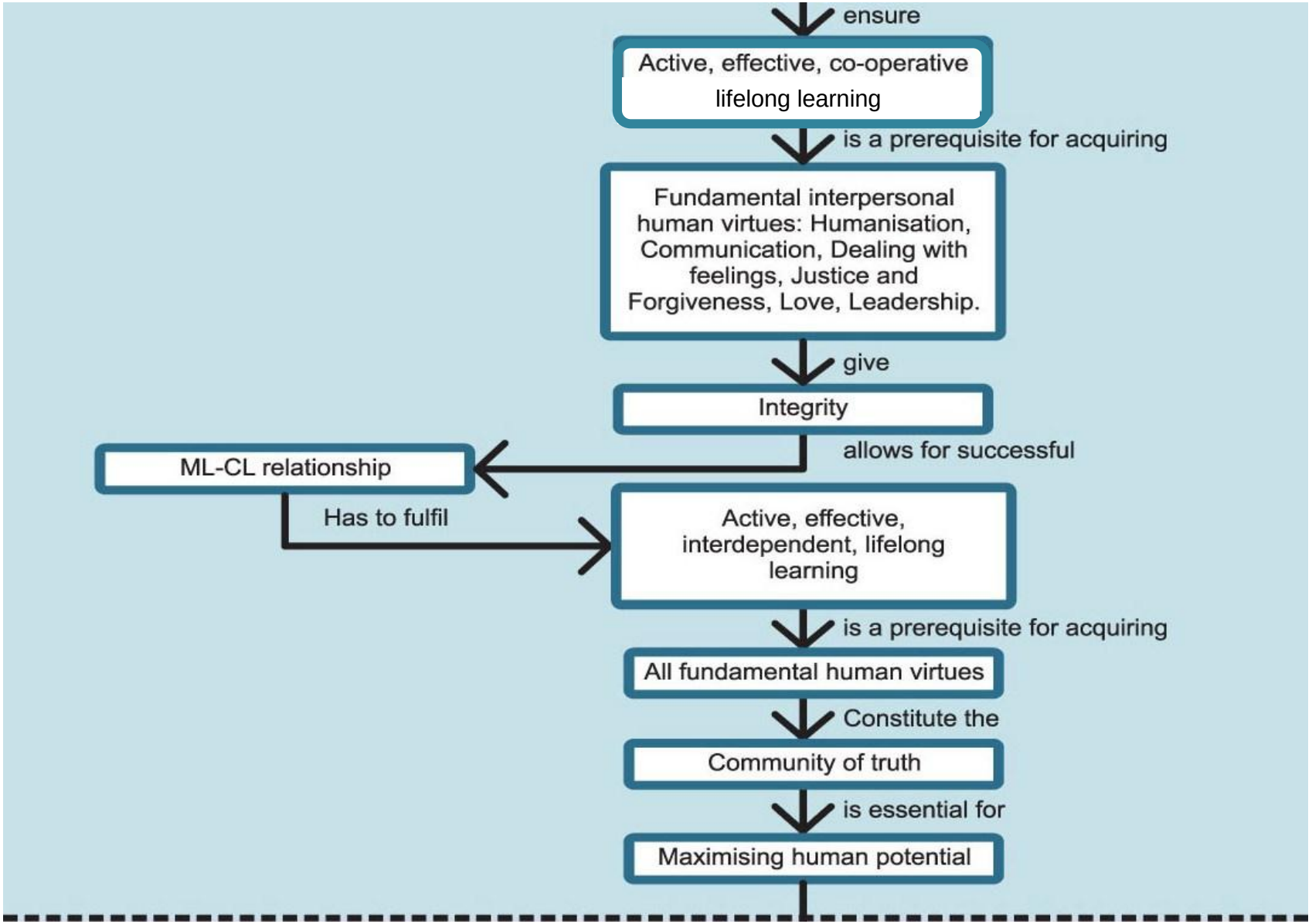

Figure 11: Practice theory of and for facilitating learning: LTE Part 3

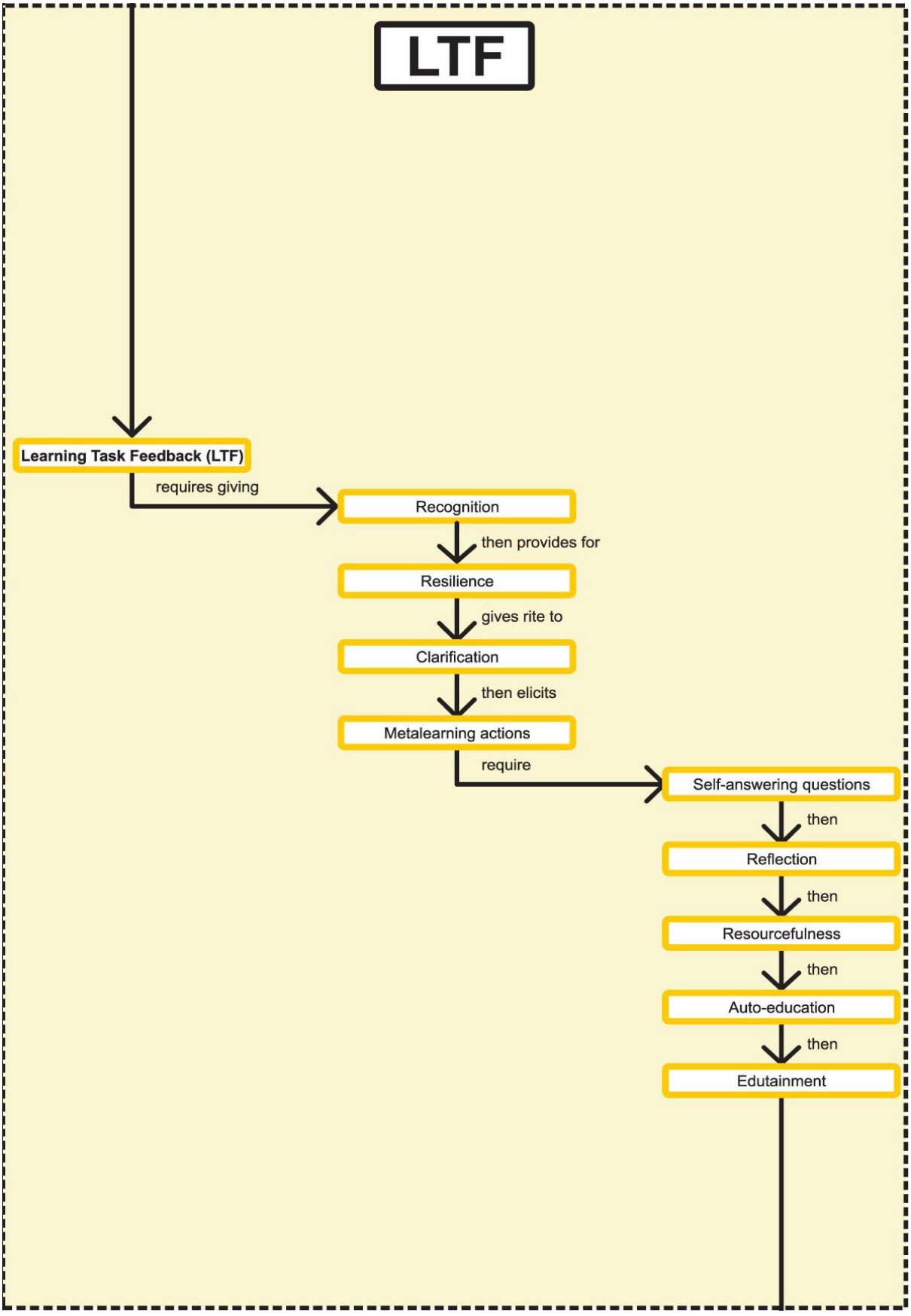

Figure 12: Practice theory of and for facilitating learning: LTF

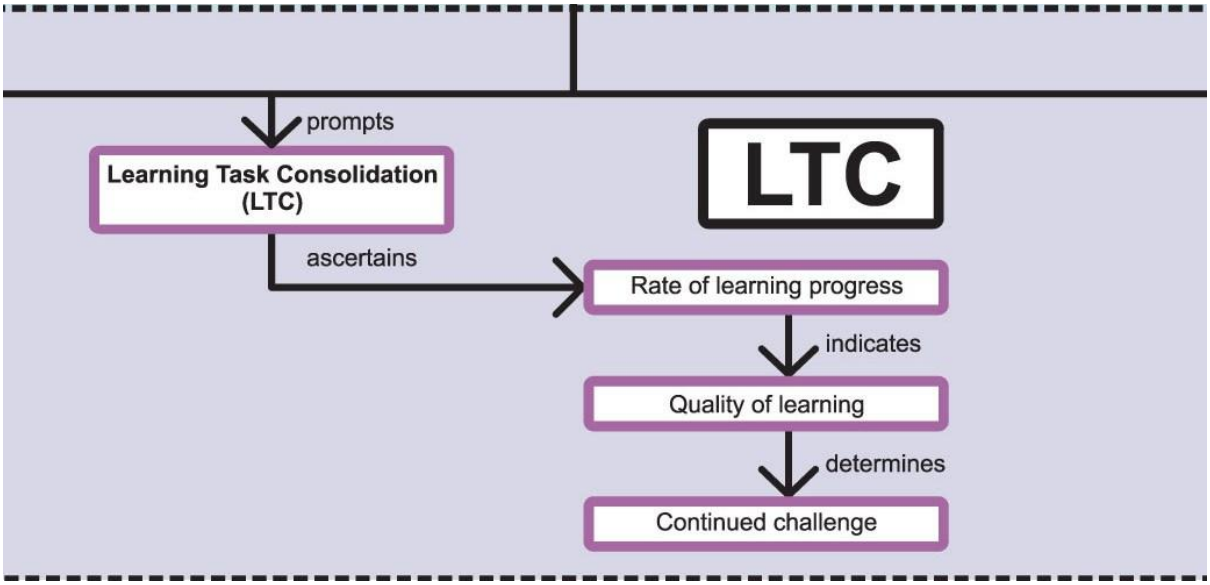

Figure 13: Practice theory of and for facilitating learning: LTC

APPENDIX B: THE RESEARCH FOR MY EDUCATIONAL FRAMEWORK OF MY AUTOETHNOGRAPHIC NARRATIVE

In the thesis I provided you with a brief history of my country's educational context (Chapter 2), and now I continue by elaborating on the holistic and global education picture which provides the foundation for my educational framework of my autoethnographical narrative.

1. What is current education achieving?

Besides my Baccalaureate and Honours years at university, a considerable part of my student life was devoted to the pursuit of a Master's degree in the Natural Sciences. This was followed by a relatively short but significant period as an employer and educator in that field. However, during the latter part of my student life, I was introduced to educational science, from its theoretical foundations and practices up to its highest academic level. I was fortunate to have been exposed to education in the Natural Sciences and in Education Science up to postgraduate level. I was even more fortunate to have had the opportunity to be involved in education in both fields during the past few years. Because of my exposure to both these disciplines, I have become acutely aware that the primary focus of education is the acquisition of knowledge constructed by experts and contained in prescribed hard copy and/or electronic formats. This acquired knowledge must be reproduced as accurately as possible. In subjects that include a practical component or problem-solving, the way in which the knowledge is acquired and even the rational, linear, cause-and-effect mental operations that are required for its acquisition, must be accurately applied to achieve the purposes for which it was intended.

Student conversations include questions and statements such as "Did you learn this?" or "I did not have time to learn that" or in the case of subjects with a practical component, "I do not remember all the theorems/rules/formulae", "I have difficulty with those problems" or "I did not practise enough". This shows that learning is regarded as nothing more than the mere memorisation of knowledge and that being a student is perceived as perpetuating already existing knowledge and skills with the expectation that it will sufficiently equip one for life. This perception may have been acceptable in the past, but it will no longer suffice. "[W]e are witnesses to one of the most significant shifts in human history" (Covey, 2006:12). "[T]he seismic scope of this change forces us to completely [sic] rethink everything we've ever understood about learning, education, schooling, business, economics and government" (Dreyden & Vos, 1999:21). However, no matter how noble current education policy is in its attempts to reflect accommodation of this shift, the reality of currently dominating education practices prompted Howard Gardner (2008a:17) to claim: "I believe that current formal education still

prepares students primarily for the world of the past, rather than for possible worlds of the future". Unfortunately, current education seems simply to perpetuate the past.

2. What is the truth about knowledge in education?

In all education, students are undoubtedly expected to gain certain knowledge and practical skills. However, knowledge and skills "cannot begin to offer us a sufficient set of ideas for … education for the twenty-first century" (Barnett, 2007:7). To deal with this statement, we need to understand and obviously agree that the acquired knowledge, which includes skills "is not to be superficial, but is supposed to have qualities of personal insight and understanding" (Barnett, 2007:164). This means that knowledge is inextricably associated with qualities. How does this come about? One of the most frequently quoted definitions of knowledge provides an answer: "Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information" (Davenport & Prusak, 2000:5). The qualities of personal insight and understanding are, therefore, possible only if knowledge is personally constructed. To talk about the 'acquisition' of knowledge in education is, therefore, inaccurate. Knowledge is *constructed* by a *person* who, during and as a consequence of the construction of that knowledge, *acquires* the qualities of insight and understanding that constitute and substantiate the constructed knowledge.

Therefore, knowledge and its inseparable qualities of at least insight and understanding belong only to the constructor thereof. This is why Piaget (1952:77) warns us about our current education practices: "Each time one prematurely teaches a child something he could have discovered for himself, that child is kept from inventing [constructing] it and consequently from understanding it". In this regard, the perception of knowledge and its relationship with education is ultimately clarified by the following profound statement of Von Glasersfeld (2008:48): "Knowledge is not a transferable commodity and communication not a conveyance". The next question is: If it is not knowledge that is transferred in education as is claimed, what is it?

3. What is the actual objective in current education practices?

The content contained in printed material and electronic formats, which is usually referred to as knowledge is at most, a *representation* of the knowledge constructed by individuals usually considered to be experts. Such a representation of unsubstantiated knowledge is known as *information* (Davenport & Prusak, 2000:5).

Information – which constitutes the past – is, therefore, not sufficient to make sense of the incredible, holistic, interconnected universe in which we are all journeying towards an unknown future. In addition, information does not offer us the possibility or the opportunity to make a unique, invaluable contribution if our human qualities are not ignited and utilised to make the journey as extraordinary as it is supposed to be. Unfortunately, instead of investing time and effort to pursue the qualities such as insight and understanding that are activated only through the *construction* of knowledge, an easier, controllable, standardised and quantitatively measurable, quick-fix alternative is preferred. The already insufficient memorised information (theoretical – presumed to be 'knowledge' and/or practical – presumed to be 'skills') is supplemented by transferring and accumulating through memorisation more and more existing pieces of information that can be accurately reproduced by a student. The accuracy of such reproductions can be easily measured.

This information-based education has penetrated even the highest levels of education. Summerlee and Murray (2008:1) expressed their concern about this type of education by asking the following shocking but fundamental question: "Should universities even continue to exist?" The authors discovered that education at universities is characterised by the following:

> We reduce knowledge to bite-size pieces of information that can be clearly defined and standardized. We can then define the minimum amount of information that has to be learned (memorized) and then we create standards that can be used to claim mastery of a particular subject. We blindly trust that developing these individual building blocks of information, and stacking them on top of one another, will somehow create an overall level of understanding and knowledge … [T]here is a tendency to cling to a vestige of hope that perhaps learning can occur through structured classes, through the hierarchical presentation of information and through the rote learning of content. (Summerlee & Murray, 2008:1)

It is important to view the concern of Summerlee and Murray (2008:1) about the survival of universities in the context of the fragmentation of education into isolated bits of inert information.

4. What are the consequences of an information-based education?

"[W]hen educational scientists divided knowledge into bite-sized chocolate morsels [information], meaning was destroyed" (Slattery, 2006:xii), and our sense of being was placed in jeopardy. This situation was first described by David Bohm (1980), one of the most significant quantum physicists and contributors to the philosophy of mind and neuropsychology of the 20th century, more than three

decades ago. The full impact of the shocking similarity with our experiences today can be illustrated only by a quotation from his work.

> It is especially important to consider this question today, for fragmentation is now very widespread, not only throughout society, but also in each individual; and this is leading to a kind of general confusion of the mind, which creates an endless series of problems and interferes with our clarity of perception so seriously as to prevent us from being able to solve most of them … Indeed, the attempt to live according to the notion that the fragments are really separate is, in essence, what has led to the growing series of extremely urgent crises that is confronting us today. Thus, as is now well known, this way of life has brought about pollution, destruction of the balance of nature, over-population, worldwide economic and political disorder, and the creation of an environment that is neither physically nor mentally healthy for most of the people who have to live in it. Individually there has developed a widespread feeling of helplessness and despair, in the face of what seems to be an overwhelmingly mass of disparate social forces, going beyond the control and even comprehension of the human beings who are caught up in it. (Bohm, 1980:1-2)

It is shocking that with all the information at our disposal, we are still incapable of solving the problems that existed 30 years ago.

5. How can current education solve our persisting problems?

The arrival of the internet, an infinite source of information, led to an information explosion that caused an information overload. The result was that people soon felt that they were ignorant since they were unable to know and understand all the information in existence. Furthermore, the diffusion of relationships between pieces of information that appear to exist separately contributes to inconceivable complexity. This is aggravated by the questionable validity, reliability and value of each piece of information resulting from its often unknown origin because anyone can be a source of information without being a source of knowledge. But even if the sources of information are above reproach, the proliferation of a multiplicity of equally valid contestations of the interpretations of information has rendered the world unknowable and supercomplex (Barnett, 2007:36-37). Weinberger's (2012:x) statement in this regard is crucial: "For every fact on the internet, there is an equal and opposite fact", and the title of his book, *Too Big to Know: Rethinking Knowledge Now that the Facts aren't the Facts, Experts are Everywhere, and the Smartest Person in the Room is the Room,* emphasises the dilemma . Technology and the World Wide Web will be with us forever. We may detest them for creating an unknowable supercomplex world, but it is a fact that we cannot live

without them. We should rather embrace and exploit them for all the good reasons, while remaining aware of their limitations, of which one is deception. The internet has created a new kind of knowledge. As we know by now, this so-called 'networked knowledge', which is nothing more than a conglomerate of information, "feels unbounded, overwhelming, unsettled, messy, linked and governed by our interests" (Weinberger, 2012:x).

The advent of social media with the uploading and unsolicited access to all kinds of personal needs, interests and opinions, adds to an ever-increasing confusion about the value of networked information: "[It] is less certain but more human. Less settled but more transparent. Less reliable but more inclusive. Less consistent but far richer" (Weinberger, 2012:x, xiii). Weinberger (2012:182) admits that ultimately, "[w]hat we have in common is a shared world about which we disagree". E-learning, the trendy new 'education' of our time, exhibits only two differences from traditional education: access to an abundance of information that can be electronically manipulated; and the *virtual* reality that can be generated in real time by real people in real places at real events. The virtuality of such a real event in real time and at a real place is defined by the fact that it can be made to disappear instantly (from the screen, from our sight and from our minds) by pushing a button. In the same manner, the electronic information depicting a real-life problem and the electronic access, accumulation and manipulation of more information through which a problem can be solved creates the impression that life's problems can be solved by pushing a button. In fact, because of these constant online connections promoted by education as solving problems, the brains of Millennials (and Generation Z, the Post-Millennials), the young adults and children of the 21st century, also referred to as 'digital natives', are changing. An expert technologist informs us that

> Millennials in 2020 do not retain information; they spend most of their energy sharing short social messages, being entertained, and being distracted away from deep engagement with people and knowledge. They lack deep-thinking capabilities; they lack face-to-face social skills; they depend in unhealthy ways on the internet and mobile device function. (Greenfield, 2014:28)

Carr (2008, 2010) warns that this information overload affects *all* of us because it can change our thinking and remembering (i.e. it can change our brains). Currently, e-learning is viewed as the solution to many of the problems experienced in education. E-learning places a virtual reality in the hands of the students in the form of electronic tablets, the latest trend encouraged by most institutions. The instructional design for e-learning is very particular and precise in stating the objective (usually in the form of a problem to be solved), the outcomes that need to be achieved and the electronic learning materials that need to be consulted (all virtual) in order to achieve the objective. The student, sitting in a classroom or any other place, isolated from the actual reality of the problem that is under consideration, (re-)constructs a virtual reality of that problem on the screen of the tablet. Through

to-and-fro electronic accessing and manipulating of the additional prescribed electronic learning material (which may even include extensive high-level critical thinking), the virtual reality produces a neat virtual result on the screen without any further action by the student.

The severance between actual and virtual reality leaves the impression that there is no need to engage with the actual problem in real life in order to solve it. Even if high-level critical thinking is involved in producing the virtual result, the production of the actual solution in real life may not be possible. This is evident in Bohm's (1980:2) description of unresolved problems (presented in Section 4), and despite the availability of infinite information – from trivial to expert – and sophisticated technology, the problems persist. Neither technology nor information, even when combined, can solve these problems, because both are ultimately dependent upon the actions of humans who are ultimately the cause of the problems. Why then is the incredible human mind incapable of solving these problems? "However powerful the body–mind tandem seems to be as coordinator of our sense perceptions, it can only see a part of the holistic picture of reality; therefore the *mind-body*-centred models which profoundly underpin today's system of education are *partial*" (Dimitrov & Wilson, 2002b: "Holistic Experience versus Partial Reasoning") and, therefore, are unable to see the whole picture. To flourish in a supercomplex world, we need to be able to see the whole picture.

5.1 Technology today and in the near future

I believe this whole picture takes into account the exponential advances in self-sustainable, intelligent, independent humanoid machines called artificial intelligence, "a fast moving technology that enables machines to perform tasks that could previously be done only by humans" (Economist Group, 2016:3), which is powered by so-called "deep learning", that is, training a system with "a labelled set of examples" (Economist Group, 2016:5). We cannot ignore this reality of technology. Hence, where students learn what computers can already do … what will it really mean to be a student in the 21st century? In fact, humanoid machines are capable of being human in ways never thought possible (Colvin, 2015:37):

> As the Pepper robot from SoftBank scurries about your home or office, it reads your emotions by your words, tone of voice, facial expressions, and body language. It responds in all those ways: its hands and posture in particular are remarkably expressive. If you thought emotions were beyond the competencies of robots, you were right for a long time. But no more.

Kurzweil (2000:8), Google's director of engineering and co-founder of Singularity University agrees:

> Even if we limit our discussion to computers that are not directly derived from a particular human brain, they will increasingly appear to have their own personalities, evidencing reactions that we can only label as emotions and articulating their own goals and purposes.

Kurzweil (2000:8) adds another dimension: "They will appear to have their own free will. They will claim to have spiritual experiences. And people – those still using carbon-based neurons or otherwise – will believe them". Humanoid machines are one thing, but Kurzweil goes a step further and refers to humans and technology in the near future becoming one with ease. This is the so-called transhumanism movement, the result of a new human species. Throughout his book, *The Singularity is Near*, Kurzweil (2005) refers to "nanobots" merged into us within the next two decades to allow us to live forever.

Vance (2010) wrote an article for the *New York Times* titled 'Merely Human? That's so Yesterday' and he tapped into Kurzweil's futuristic beliefs: that the human species will "extend its physical and mental reach beyond current limitations". (Kurzweil, 2005:25). Seven years later, Max (2017:48) wrote an article for *National Geographic* titled 'Beyond Human' in which he also refers to the statement of Kurzweil (2005:25). Kurzweil believes that being a human implies 'extending' a human by adding technology. He is right in the sense that technology was initially developed as a tool to be used by human beings to improve lives, meaning to use human potential to develop technology to serve us. However, now to add technology to us humans in a way that we are controlled by the technology has changed the picture completely.

In contrast to Kurzweil's beliefs, Colvin (2015:43) argues that we need "to become more essentially human, to be the creatures we once were and were always meant to be". He believes this is how humans will add value (Colvin, 2015:38) to the age in which we live. In fact, if humans interfere with the evolutionary process in such a way as to allow for a new species to exist, we cannot call this species 'human' anymore. Consequently, it is absolutely critical to define what 'being human' really means and for this, we need to determine what human potential is since this is profound in the context of education.

6. What is missing in current education?

The constant, unpredictable, escalating changes in reality that we are experiencing are not only new but are radically and qualitatively different. Many of the changes are exciting and absorbing and reveal the world in ways that were never possible before, in every dimension through instantaneous,

real-time, brutal disclosure. This invasion has given us access as never before. Grulke (2000:3) explains:

> This is the revolution of you, me, and the person next door. The revolution of the empowered individual. Never before in the history of the world, have ordinary people held as much power, as much freedom, as much opportunity to accomplish extraordinary things. Never before have ordinary people been as capable of changing the world, of seizing the future and making it happen.

Having students join this revolutionary shift of possible empowerment with its unlimited interconnectivity and immediate access to overwhelmingly abundant, stimulating and real-time knowledge through increasing self-sustainable technology is an imperative for education. However, its irresolute downside places knowledge as the focus of education in serious jeopardy. It is described as the multiplicity of incompatible differences of interpretations of the world, rendering knowledge perpetually contestable and the world ultimately a supercomplex unknowability (Barnett, 2004, 2007, 2013; Weinberger, 2012) where knowledge is enclosed and manipulated within the confines of a technological device so smart that its seduction addicts us to the illusion that this virtual reality solves all our real-life problems (Huddleston, 2013, 2016).

Even though this shift has effectively placed unbridled freedom and power in the hands of each individual, these consequences expose the inevitable mutual ethical imperative of each individual who utilises it. The primary concern of education, therefore, is not knowledge, instantly accessible in abundance anywhere, but human agency and its quest.

With regard to this unbridled freedom and power of choice that each individual has been given, Drucker (2000:8) explains the absolute prerequisite for utilising it as follows: "For the first time, they [every single one of us] will have to manage themselves". But *this* self-management transcends everything we have ever understood self-management to be; it is much wider, deeper and higher because its individual intensity has to result in "personal development of the highest order" (Alexander & Potter, 2005:66). This starts with small children cleaning their rooms and packing away their toys at the end of the day. However, self-regulated learning (or any of its derivatives) does not suffice. Self-regulated learning is designed for academic performance and academic success, which is clearly important for a student's future employment. Academic performance and success have become increasingly secondary to the key attributes required for employability. Regarding the employability of graduates, Banajeree (2014:para.4) remarks: "Despite the fact that employers are in a position to have their pick of the crop … employers and business leaders insist that their demand for talent is not met by current supply". This deficiency refers to an absence of the *attributes* that are necessary for blue-collar workers and CEOs alike. In fact, Banajeree (2014:para.6) found that "a candidate without these personal characteristics was a non-starter". The personal characteristics referred to are

intrapersonal management (integrity, self-discipline, self-management and emotional management); work ethic; leadership; intellectual proficiency (critical thinking, problem-solving, creativity, humility); and interpersonal or social proficiency (communicative proficiency – reading, writing and speaking, empathy, teamwork) (Colvin, 2015:35-43). It is evident that the development of these personal characteristics is not included in the curricula or practice of our education institutions (Banajeree, 2014). However, these characteristics are vital because we will increasingly encounter a reality never imagined before, in ways never experienced before, on levels never exposed to before, with an integrity never demanded before and determined by ethical imperatives never required before. This clearly necessitates "an unprecedented change in the human condition" (Drucker, 2000:8) and its associated challenges. According to Pink (2006:3), we "now require a whole new mind that has to enable us to see, respect and enhance the quality of the whole of reality and reality as a whole – with all its associated implications and consequences".

August Turak (2014) addresses a gross misconception about the relationship between personal development and leadership in an article with the title, 'What Every Leader Must Know about Personal Development'. The misconception about this relationship is that personal development is something we need to do in order to achieve success, especially in our careers. However, when we do this, we isolate and compartmentalise personal development as something we do at home in our spare time in order to face the challenges of our careers in the real world. Unfortunately, this world view is simply putting the proverbial cart before the horse. He subsequently makes the following profound statements:

> Whether you call it personal development, personal growth, self-actualization, self-transcendence, or spirituality does not matter. What matters is realizing that the reason you were born is to become the best human being you can possibly be. Personal development is not a tool for reaching a bigger goal. Becoming a complete human being is already the biggest and most noble goal you can aspire to. (Turak, 2014:para.4)

In the book by Turak (2013), *Business Secrets of the Trappist Monks: One CEO's Quest for Meaning and Authenticity*, he refers to the exceptional success of Trappist monks and that one's fundamental mission in life must be personal development.

The current mind-body-centred models of reality that underpin today's education provide only a partial picture. They represent only the epistemological (mind-knowledge) and practical (body-skills) pillars of an educational project in the 21st century. "By themselves, these two pillars, will topple over: they need (at least) a third pillar – the ontological pillar – to ensure any kind of stable structure" (Barnett, 2007:7). By using the metaphor of a pillar, this statement is profound in the shift of focus away from a knowledge and skills pillar that defines education as a 'learning to know' paradigm – a partial, insufficient and, therefore, deficient education.

Ackoff and Greenberg (2008:xiv) bring the new paradigm of education into focus: "Education should be a lifelong enterprise, a process enhanced by an environment that supports, to the greatest extent possible, the attempt of people to 'find themselves' throughout their lives". It is only through managing ourselves that we are able to find ourselves. The ontological pillar is, therefore, not only another pillar but is also the stabilising and determining pillar in the educational project. Knowledge and skills quickly become redundant because of the rate of change. Half of what students learn in their first year of study is outdated by the third year. According to Barnett (2007:101-102):

> [Human] dispositions and qualities are durable in their nature. They constitute the student's pedagogical being. It is they that have to be the focus of 'teaching'… Through their dispositions and their qualities, students have the capacities to acquire both knowledge and skills … Without dispositions and qualities, nothing else of any substance is possible. Learning is not possible, the acquisition of skills is not possible, and nor is any independence of action or thought possible.

Education is, in principle, not an epistemological task requiring the acquisition of knowledge and skills. It is primarily an ontological challenge to the human being to transform and become authentic – nothing less.

The pillar that will determine how well we see the holistic reality is a 'learning-to-be' paradigm. This paradigm uses the philosophy of Martin Heidegger (1962) as the phenomenological ontology of *Dasein* ('being there') and *Being* (as the inseparability of the human being and its *experience* of being there or present) as its foundation. Escudero (2014:6) links this with autoethnography extremely well when he maintains that Heidegger's (1927) magnum opus, *Being and Time*, "demands that the reader undergo for him- or herself his or her own journey of self-discovery. It outlines a path of self-discovery and self-analysis". Barnett (2007:167) warns us very seriously that this very "[b]eing is now called forward unremittingly, day in and day out" and refers to it as "being-for-complexity" (Barnett, 2007:167) since we are living today in a world of increased complexity. In effect, the seriousness of autoethnography is emphasised.

As human beings, we come into this world as potential and therefore purpose, which is encapsulated in the uniqueness of our individual *authenticity*. Our Being is always in a relationship with something. We are primarily in a relationship with ourselves, our internal environment and external environment (human and non-human), with the latter being natural or manmade. These relationships inadvertently influence us, and we influence them. For this reason, we have a responsibility to care for everything and everyone with whom we have a relationship. Frankl (2011:32) states that "being human is being responsible – existentially responsible, responsible for one's own existence". Frankl (2011) further explains that humans can only exist authentically when they are responsible. There is a strong link between being responsible and having integrity. According to Fishman (2014:26) from the

International Centre for Academic Integrity, integrity lays the foundation for responsibility. Integrity can be seen as the virtue of one's own convictions and deepest values (Rand, 1964:46).

Unfortunately, we are born into a world of compliance and conformity, a world in which society manages us to the extent that we are living inauthentic lives, resulting in the making of choices based on outside influences (Heidegger, 1962:428; Peck, 1978:42). My quest and your quest in life is, therefore, to pursue the truth (the word 'truth' translated into Greek is *aletheia* that means continuous revealing or disclosure) in all these relationships because we need to care for them appropriately. But we can only care appropriately when we pursue the truth about our own authenticity, who we really are, what we are capable of and our ultimate purpose.

The importance of authenticity in education cannot be underestimated. Although Barnett (2007:40) specifies higher education in his statement, what he says is equally valid for all levels of education: "'Authenticity' is perhaps the key concept within the deep structure of the idea of higher education" and "A higher education that does not call, does not insist, on authenticity in the student is no higher education". However, authenticity is not simply there for the taking, "it has to be fought for, won and sustained" (Barnett, 2007:40).

Becoming authentic demands effortful, committed work that requires courage, honesty, integrity and determination. First, we must excavate and destroy the deficient and paralysing inauthentic core beliefs that we have adopted and allowed to obscure our authenticity in order to liberate ourselves from their devastating power. Only when this is accomplished, are we ready to move deeper:

> At this deeper level, our living organism is a system tingling with purpose … the deep organic programming that underlies our sense of what is 'right'. And just as each of us is a unique expression of our genetic code … we are each, similarly, a unique expression of our cellular commitments … These cellular commitments are the burning fuse of purpose that snakes through our lives, always focused on the explosive realization of our full human potential and eventual self-transcendence. (De Quincey, 2005:57-58)

This essential work consists of a process that requires self-transcendence, purpose and authenticity. These guidelines should enable people to undertake rigorous and appropriate self-management. Socrates revealed a fundamental existential truth when he declared: "An unexamined life is not worth living". This examination of one's life must be very specific because it has to promote self-transcendence for the purpose of becoming authentic. It represents the process of learning, but is fundamentally concerned with learning more about the quality of our lives. Smilkstein (2011) states that we are born to learn, and Leonard and Murphy (1995:xv) expand on this as follows: "Our destiny is to learn and keep on learning for as long as we live".

Since we will spend a lifetime pursuing authenticity, it should be no surprise that we are specially created for this purposeful learning. Victor Frankl, a prisoner in Auschwitz and Dachau whose family perished in the gas chambers, might be thought of as someone who had nothing to live for. On his release, Frankl (2008:105) wrote one of the most powerful and enduring works of the 20th century that was based on the notes in which he had secretly managed to record his experiences:

> Man's search for meaning is the primary motivation in his life and not a 'secondary rationalization' of instinctual drives. This meaning is unique and specific in that it must and can be fulfilled by him alone; only then does it achieve a significance which will satisfy his own ***will*** to meaning.

Please note that it is the *search* for meaning that is the primary motivation in man's life, not the finding of it. This does not mean that finding meaning is excluded in this learning process but rather indicates the perpetual innate will to *improve the quality of meaning* and, therefore, of life. Another vital remark is that the search for meaning must be conducted *by the individual human being alone* in order for one to benefit from the continuing generated will to search for new, improved meaning for which the only purpose is improvement of the quality of life. This does not suggest that meaning cannot be constructed in conjunction with other human beings but that the individual human being must engage in the journey inwards, a journey that can only be taken alone to explore the potential that is already in existence there, to find what is latent and not yet exploited and to take ownership of the meaning that has been constructed before it is exposed for examination by others. Esping (2010:204) confirms Frankl's (1946) book, *Man's Search for Meaning*, meets numerous autoethnographic functional and structural characteristics as described throughout Ellis' (2004) book *The ethnographic I: A methodological novel about autoethnography.*

The *will*, meaning the search for meaning or the construction of meaning incorporates the will to learn, which is the foundational, ontological human disposition. "Will is the state of the person's being. It provides internal energy; spirit even" (Barnett, 2007:18). All other dispositions (such as the will to engage, the will to explore, the will to experience, the determination to go forward), are built on the will to learn (Barnett 2007:101). However, all dispositions are also foundational when compared with human qualities. Human qualities (e.g. integrity, courage, responsibility, resilience, self-discipline and respect) "supply the character of the person that is already energized through the dispositions" (Barnett, 2007:101). Within this context, the will to find meaning is fundamentally a quest to find out who we really are, what we are capable of and what our ultimate purpose is. The will to learn is, therefore, also the will to self-transcend into a flourishing, life-enhancing authenticity.

> Will, we must say and not shirk from saying it, is ontological through and through. Without will, the idea for person cannot get off the ground. Without will, too, the idea of a student cannot seriously have meaning … It indicates that a student is committed, is

> energized, is giving of herself in a firsthand way. It indicates much more too; for example as to matters of responsibility and other virtues that we must come onto. Where the will is present, everything is present, everything is possible. Where it is absent, nothing, educationally speaking, is possible. (Barnett, 2007:18-19)

Unfortunately, our current partial, insufficient and therefore, deficient mind-body education is dismally failing in its ontological challenge.

> Due to the depersonalization and alienation occurring in contemporary education … education has lost sight of and is moving further away from what it means to be truly human. That is, both students and educators are estranged from their authentic phenomenological sense of self-hood … For the sake of education's potential reform, once made philosophically aware of this condition, educators should seek a return for appropriation to this forgotten understanding of what it means to be human and which is, in the first instance, always and already a primordial way of Being-in-the-world in which life unfolds as an original 'educative' process. (Magrini, 2011:1)

The consequence of failing to satisfy the ontological quest for accessing the treasure of extraordinary potential residing within the human being and utilising it in fulfilling our unending quest of becoming authentic is incomprehensible, as preceding paragraphs have indicated. However, we are also witnessing increasing devastation in all domains and at all levels.

> According to some of the most distinguished and thoughtful students of the mind, one of the most devastating things that can happen to anyone is to fail to fulfil his potential. A kind of gnawing emptiness, longing, frustration and displaced anger takes over. When this occurs, whether the anger is turned inward on the self or outward towards others, dreadful destruction results. (Hall, 1976:4)

7. What are the prerequisites for education in the contemporary world with an unknown future?

The modern world is characterised by its exhilarating pace and complexity. In the midst of this, education has created another world, completely separate and physically separated from the real world, with an institutionalised claim to independence through policies, content and physical appearance. The world of education has become so enclosed that it can be contained in the confines of an electronic tablet, more aptly called a virtual reality – a reality that is outside, separated and removed from the learner and a reality of which the learner is not a part. The situation is further

aggravated by students becoming so trapped between realities that they lose touch with their external virtual reality and can only learn *about* it.

In their publication titled, *Turning Learning Right Side Up – Putting Education Back on Track*, Ackoff and Greenberg (2008:xiv) explain that education is not about finding things but about finding ourselves. Life and education can never be separated, regardless of how sophisticated the education is. Dewey (1897:78) explains the relationship between education and living, or lived experience, as follows:

> I believe that education, therefore, is a process of living and not a preparation for future living. I believe that school must represent life – life as real and vital to the child as that which he carries on in the home, in the neighbourhood or on the play-ground.

For example, for the postgraduate quantum physics student, education should be no different if the education originates from a challenge to transform the student through the authentic experience of the actual reality of quantum physics. Such a challenge invariably compels the student to learn to explore the unknown quantum physics reality in every possible way and on all levels required, in order to make sense of it (construct the meaning of it for the first time – knowledge) in a way that ensures an authentic, self-transcendent, life-changing experience.

> Infinite is the number of levels through which reality manifests – from the macro level of the whole universe to the micro level of a single quark. And all the levels project on human existence – not only because everything relates to everything else in the impossible-to-separate web of existential dynamics, but also because it is through our experience that we can grasp the meaning of the manifestations of these dynamics and ride on its inexhaustible power. We are endowed with unlimited potential to sense – recognize and understand – the meaning of the events of our experience. In every creative act of realization of this potential, a level of reality opens some of its secrets to us. (Dimitrov & Wilson, 2002a:114)

However, these secrets are revealed only if the actual reality (the real-life challenge) in its uncompromising supercomplexity demands engagement with a problem about which nothing is certain, including what the actual problem is, what has to be done, what the effects will be, what has to be done next and what efforts are required to resolve it – even though all of this has to be contemplatively calculated. The actual learning processes required to resolve the challenge will, therefore, "be both high-risk and transformatory in character" (Barnett, 2004:257). But knowing that the reward for this work is so much more than 'playing house' and is in essence transformatory, the will to find meaning and to learn provides the courage to engage fully. Having thus surrendered to "not knowing" (Ralston, 2010:25-36) and inadvertently submitting to openness to the transcendence

and awareness of time, place and effort, one is rewarded by the exhilaration of finding the authentic self through a new consciousness of who one really is, what one is capable of and what one's ultimate purpose is. Besides the reward of finding oneself at a higher level of authenticity, it is the difficult inward journey that one has to take alone – with one's whole and inseparable ontological self – that rewards one with the *deepest* joy (Zull, 2011:76) and that makes every moment of life worth living!

8. What constitutes our ontological being?

This section explains the most important distinguishing and functional features of each entity (Slabbert, De Kock & Hattingh, 2009:74-82) in the context of this proposed study and for the purposes thereof.

8.1 The body

The body is probably the most tangible evidence of our existence. It is the presence of the body that makes authentic relationships with actual reality possible. Maintaining the vitality/physical life of the body is paramount in this regard because the body acts as the operational interface between the external and internal environments. The entire body, not only the senses, acts as a receptive or sensory instrument to capture the experiences from the external environment and make them available for processing in the internal environment. In addition, the body acts as the executive or motor instrument that is able to act according to the prompts of the internal environment to maintain or change the external environment.

8.2 The mind

The physiology of the brain is determined by electrical neural impulses that are received from the body and conducted through neural networks that connect to specific areas of the brain. The brain processes the impulses and sends executive impulses to the body (the motor instrument) to which it reacts. The function of the mind is to construct cognitive structures as referential models for processing the stimuli. The mind is, therefore, the processing interface between the receptive and the executive body. However, although capable of higher-order thinking, the mind's existence depends on its existing referential mental models. The mind's successful premeditative recognition of the same or similar impulses increases the forces that keep the model intact.

The problem is that more novel impulses are increasingly 'forced' into 'recognition' by the existing model in order to maintain its stability. However, if the novelty of the impulse transcends the capability of the mind to force it into any type of recognition because the authentic real-life experience persistently refutes its compromised and therefore deficient resolution, the mind needs to acknowledge the redundancy of its existing structure and subsequently its very existence. And this, its existing cognisance, is incapable of accepting, which places the mind in a paradoxical turmoil. A new cognitive referential structure has to come into being – an authentic renewal of the mind.

8.3 The soul

Most cultural and religious traditions recognise that having a soul is essential to being human and in most of these traditions, the soul involves both intellect and emotion. Since the intellect (brain, mind) is such an extraordinary entity and is so different from both the body and the intellect-emotion duality, I believe it is appropriate to distinguish between the intellect, the mind and emotion. Since the prominence given to emotion in Goleman's (1995) publication, 'Emotional Intelligence: Why It Can Matter More Than IQ', it has been increasingly regarded as a very important existential reality. Throughout his omnibus, *Emotional Intelligence & Working with Emotional Intelligence*, Goleman (2004) argues that we cannot isolate thought and decision as functions belonging solely to the intellectual intelligence. In fact, Goleman (2004) claims that emotions play a key role in these functions and are regarded as the ability of how well we relate to ourselves (internal environment) and to the external environment (natural and synthetic).

Goleman (2004:318) identified five "basic emotional and social competencies": self-awareness, self-regulation, motivation, empathy and social skills. Emotional intelligence deals with self-awareness and understanding one's own feelings and the feelings of others so that the relationships we have, both internally and externally, will flourish through managing our feelings appropriately and as a result, develop empathy (Slabbert, De Kock & Hattingh, 2009:75). Empathy can be defined as "[s]ensing what people are feeling, being able to take their perspective, and cultivating rapport and attunement with a broad diversity of people" (Goleman, 2004:318). The important role of emotion in learning is emphasised by Claxton (1999:15) in his statement, "learning itself is an intrinsically emotional business". Zull (2011:17) agrees that all learning is in essence emotional and, therefore, we "can't get rid of emotion". In addition, will is intimately linked to emotion (Barnett, 2007:18), and emotions are the source of energy. Barnett (2007:18-19) describes a student as follows:

> A student is someone who gives something of herself, who throws herself into her studies. … The idea of will, therefore, bears on the student as a person … It indicates that a student is committed, is energised, is giving of herself in a first-hand way. It indicates

> much more, too; for example, as to matters of responsibility and other virtues that we must come onto. Where the will is present, everything is possible.

Why then is a human being ontologically a source of energy? Because authenticity has to be fought for, won and maintained. When and how does this happen in learning? No learning or little effective learning takes place if there is no discrepancy between incoming neural impulses and their recognition by a cognitive structure. It is only when there is an irreconcilable discrepancy between the impulse and the referential model that the emotions of the soul are activated. The available released energy is now accessible, but how it will be used is a vital choice. It may be used to stabilise and even strengthen an already faltering inauthentic mental model, or it may be used to access the realm of "authentic presence and the unfolding of a future full of possibilities" (Jaworski, 2011:185).Together with the powerful additional energy of the ontological will, the available released energy may be used in learning to transcend all the paralysing and destructive forces that oppose the quest for authenticity.

Rubert Plutchik (2001:347-348), one of the most well-known researchers on emotions, describes an emotion as follows:

> [A]n emotion is not simply a feeling state. Emotion is a complex chain of loosely connected events that begins with a stimulus and includes feelings, psychological changes, impulses to action and specific, goal-orientated behavior. That is to say, feelings do not happen in isolation. They are responses to significant situations in an individual's life, and often they motivate actions.

It is due to exactly the above that it is necessary to become aware of the experience and what it means by making sense of it and ultimately understanding what one feels. This has a profound effect on self-analysis in autoethnography. Damasio (1999:37) confirms Plutchik's (2001) definition with his research:

> I separate three stages of processing along a continuum: a state of emotion, which can be triggered and executed nonconsciously; a state of feeling, which can be represented nonconsciously; and a state of feeling made conscious, i.e. known to the organism to have both emotion and feeling … consciousness must be present if feelings are to influence the subject having them beyond the immediate here and now.

8.4 The spirit

Frankl (2011:32) elucidates that "human existence is spiritual existence". We must search for spiritual growth and a life more dedicated to transcendental principles in order to enhance spiritual

intelligence. Peck (1978:37) says that one of the greatest problems of human existence is distinguishing between what we are responsible for and what we are not responsible for. To solve this, one needs to be willing to suffer continual, stringent self-examination. Peck (1978:75) continues:

> Spiritually evolved people, by virtue of their discipline, mastery and love, are people with extraordinary competence, and in their competence they are called on to serve the world, and in their love they answer the call. They are inevitably, therefore, people of great power …

With great power comes great responsibility for we have the freedom to make choices. Choice contains a spiritual element as with all the virtues, and the action taken depends on our spiritual well-being: I am a powerful being; the consequence of the choice is construction or destruction, and the difference lies in my moral ethical position.

To transcend to greater heights within oneself, thus reaching greater levels of authenticity, is rarely an easy or quick task, for to transform is difficult and mostly painful, and it takes time. In fact, Frankl says it is "an exceptionally difficult external situation [that] gives man the opportunity to grow spiritually beyond himself" (Frankl, 2008:80).

Spirituality is not religion although religions may be described as the expression of the spirituality of a particular group of people. It is unfortunate that prominent researchers and authors have refrained from using the label spirituality for this reason and thus, do not necessarily portray the spirit of this ontological constituent of being. One wonders if this denial of spirituality in education has not taken its toll and promoted spiritual stuntedness. Fortunately, the situation is changing.

> Across many different realms, there's a growing recognition that spirituality – not religion necessarily, but the more broadly defined concern for meaning and purpose in life – is a fundamental part of the human condition. Indeed, our capacity for faith – again, not religion per se, but the belief in something larger than ourselves – may be wired in our brains. (Pink, 2006:211)

This possibility becomes evident in the permeation of spirituality in almost all the life domains, science, business, economy, education, art, health, family and all types of organisational life reported in research and practice (Pink, 2006:221-231; Wheatley, 2006:169-189). This is becoming so common that Delbanco (2000:113) reports: "The most striking feature of contemporary culture is the unslaked craving for transcendence". In close association with this, Pink (2006:60) indicates that "the most significant change of the conceptual age might be occurring outside the office – and inside our hearts and souls. Pursuits devoted to meaning and transcendence are now as mainstream as 'double tall latte'."

Transcendence refers to entering the spiritual realm of our being beyond what our hearts and minds can comprehend to make contact with an entity that is much wiser, more powerful and more trustworthy than our own frail egos. It is the realm that we trust to provide us with the answers to life's teleological questions, the realm of our capacity for connection – for authentic relationships with the whole of reality, which results in self-transcendence to a higher order of being authentic:

> [S]cientific evidence – largely from the field of neuroscience, which concerns our basic biology and how our brains develop – shows that the human child is 'hardwired to connect'. We are hardwired to connect to other people, to moral and spiritual meaning, and to openness to the transcendent. Meeting these basic needs for connection is essential to health and human flourishing. (Institute for American Values, 2003:2)

But most of all, "[d]eep spirituality, the deep spiritual centre of the self, is about potential … This is the domain of pure potential … The centre is a source within ourselves replete and inexhaustible" (Zohar & Marshall, 2001:239). If we are spiritually intelligent, we are able to become the vital beings that we are intended to be and to transform the potential into our authentic selves. In this sense, we are also the source and the purpose that we are fulfilling.

The four constituents of human existence have been referred to as gifts, potential, altered states, levels or domains of consciousness and domains of intelligence: body = physical intelligence (PQ), mind = mental intelligence (IQ), soul = emotional intelligence (EQ) and spirit = spiritual intelligence (SQ). In the context of this study, these represent ontological levels of being and epistemological ways of knowing. The human spirit, however, is the central constituent and guides the other three constituents. This is expressed in the profound statement of Pierre Teilhard de Chardin: "We are not humans with a spiritual experience, but we are spiritual beings with a human experience" (Covey, 2004:319).

But how is spiritual growth achieved? In general, the road to spiritual growth requires us to distrust what we already believe, actively seek the threatening and unfamiliar and deliberately challenge the validity of what we have previously been taught and hold dear. "The path to holiness [spiritual maturity and authenticity] lies through questioning everything" (Peck, 1978:194). A more specific answer to the above question iterates what was revealed in previous paragraphs:

> Life is a series of problems. Do we want to moan about them or solve them? … [I]t is in this whole process of meeting and solving problems that life has its meaning … Problems call forth our courage and our wisdom; indeed, they create our courage and our wisdom. It is only because of problems that we grow mentally and spiritually. When we desire to encourage the growth of the human spirit we challenge and encourage the human capacity to solve problems. It is through the pain of confronting and resolving problems that we learn. (Peck, 1978:13-14)

Dimitrov and Wilson (2002a:46) explain why problems "call forth" and "create" our courage and our wisdom – two of the many human qualities that should be called forth and created as the focus of our education. The context of the problem is within real-life or reality as it occurs in its holistic, uncompromising supercomplexity. It is a problem that the student is immersed in to the extent that he or she is truly experiencing (or will certainly experience) the inescapable adverse effect that it has (or certainly will have) on his or her life right now (or in the future) if it is not resolved. This condition should be so adverse that the student is provoked into an incessant desire that compels him or her to resolve it. Therefore, the problem is that if a student encounters a problem directly and for the first time, no ready-made solution will be available. The 'poorly' formulated problem requires searching for appropriate information to understand it and to determine what will be required to solve it.

8.5 How are we whole?

Human experience "emerges out of the complex interplay between the four vital constituents of our nature - **body**, **mind**, **soul** and **spirit** – while in constant dynamic interaction with the environment" (Dimitrov & Wilson, 2002a:48). Such a human experience is possible only if our consciousness, "the source of all meaning, value, and purpose in our lives and in the world" (De Quincey, 2005:82) – what it means to be human and especially what it means to be a student – is ever alert and continuously growing. In view of this imperative, Dimitrov and Wilson (2002a:6) state:

> As far as consciousness is a characteristic of human reality and not only a product of the mind, the growth of consciousness is possible only if all the factors responsible for the integrity of all inseparable constituents of human individuality, i.e. **body**, **mind**, **soul** and **spirit**, are simultaneously activated.

9. How does education make the student whole?

The immediate preceding paragraphs epitomise an ontological reality that has been completely misunderstood, especially in the context of education. Humans are part of a reality that is characterised by the interconnectedness of its constituent parts. Even though we can distinguish between the external environment and the human being (in this case the learner represented by the student), they are part of one whole. When holism in education is considered, the focus is on the addition of various constituents. Regarding the achievement of holism with reference to the student as a human being, the discourse is in the form of: I have covered all the levels of Bloom's taxonomy (adding all the separate levels) in my questions, which means recognition of the cognitive (mind) part but exclusion of all the other parts of being human.

Holism cannot be achieved by adding parts. In fact, holism does not have to be achieved – it already exists! A child is born into it and simply has to survive. Reality does not simplify or compromise its supercomplexity because of the presence of a child or a student but simply states: "There it is – deal with it!" Students gain nothing from the tendency of education to simplify reality; rather, as seen in the preceding paragraphs, the consequences have been detrimental.

The fact is that our students are endowed with everything they need, not merely to survive but to thrive in and in spite of a hostile reality. That is why Smilkstein (2011) says that we are born to learn, but not the kind of 'learning' that our education proposes (i.e. not the learning that focuses on the acquisition of knowledge and skills as building blocks although they are the inevitable fruits of authentic education), but learning that focuses on becoming authentically human through cultivating the essential dispositions and qualities that already potentially reside in the self. This potential is activated only when the reality of life produces a problem that cannot be resolved by means of existing knowledge and skills. This dissatisfying condition humbles the human being who has to surrender to 'not knowing' (lack of knowledge) and 'not being able to do' (lack of skills).

At this point, another fundamental human virtue (disposition, quality) comes to the fore or the strengthening of an already active virtue occurs, namely the will to learn. Through these virtues, the student possesses the ability to construct the most appropriate, valuable and functional knowledge and skills. The cultivated virtue(s), the constructed knowledge and the acquired skills are the fruits of resolving the challenge with our entire being – body, mind, soul and spirit – and working in unison or holistically.

10. Mindfulness

According to Barbezat and Bush (2014:98), mindfulness or "heartfulness" (Kabat-Zinn, Davidson & Houshmand, 2011:37) is the fundamental contemplative performance for educational practices, and it has major relevance in the lives we live today (Kabat-Zinn, 2013b:3). Kabat-Zinn, Davidson and Houshmand (2011:37) define mindfulness as "moment-to-moment non-judgmental awareness, cultivated by purposely paying attention in the present moment". Kabat-Zinn (2013a) emphasised this during the opening of his *Askwith Forum* talk on mindfulness in education (Askwith Forum is a series of public lectures at the Harvard Graduate School of Education).

Professor Dharmasakti (president of the Buddhist Association of Thailand), when asked to write the foreword of the manual *Anapanasati*, the first comprehensive manual on Buddhist meditation in English (Bhikkhu, 1980:ix), defined the word *Anapanasati*:

> To my mind, the practice of Anapanasati (Mindfulness of Breathing) apart from being a way of Buddhist meditation, is a very helpful and necessary means of building strength of mind and body to face the difficulties and problems of a working life in this confused modern world of ours.

Breath is used to acquire concentration (attention); *anapana* means breath and *sati* means mindfulness (Hanh, 2008:7, 129). Rinzler (2012:15) reminds us that breath is the object of meditation practice, which connects the human body to the mind's thoughts that lead to consciousness of everyday life (Hanh, 2008:15), resulting in mindfulness (Rinzler, 2012:17).

With reference to learning, metalearning is ultimately mindfulness, and reflection is ultimately contemplation, where solitude – disconnection from our normal way of doing things – leads to contemplation that in turn, leads to mindfulness – "the life of awareness" – for it is exactly this that makes us live life to the fullest (Hanh, 2008:15).

10.1 Meditation and modern psychology

During March and April 2014, I undertook an online course on Buddhism and Modern Psychology in which the lectures were presented by Prof Robert Wright from Princeton University. The course focused on the scientific evaluation of certain Buddhist ideas, which are certain thoughts called 'naturalistic' thoughts, and brought modern psychology and natural selection under scrutiny. I believe that this gives validation to the way of the Buddha, which is "not a faith-based system in the traditional sense" (Dalai Lama & Cutler, 2009:xxv). Questions that can be addressed regarding scientific evaluation of certain Buddhist ideas are human suffering, anxiety and sadness and how we deal with this unavoidable suffering.

Buddhism claims that if we can see the truth about reality, we can alleviate our suffering, possibly even end it (Wright, 2014) and as Wright (2014: "Video lecture 1") states, ultimately "align ourselves with moral truth". I agree with this statement and believe that meditation is a way to reach this truth, thus bringing more happiness and less suffering to a person by really experiencing the world as it should be experienced. In fact, modern psychology agrees with the above. The book called, *The Mind's Own Physician,* (Kabat-Zinn, Davidson & Houshmand, 2011) is based on scientific conversations with the Dalai Lama on the healing power of meditation – literally and figuratively – and deals with the strong link between ancient meditative practices and modern psychology and neuroscience. In his book, *The Universe in a Single Atom: How Science and Spirituality Can Serve Our World*, the Dalai Lama (2012) explicitly refers to the seemingly unrelated fields of science and as

he refers to it, ‘faith’, which together can alleviate human suffering where suffering occurs due to absence of wisdom (Hanh, 2008:94).

Zajonc (2002:59) maintains that in an educational context, the relationship between these two fields must be acknowledged. Scott (2002:34) refers to this as “the reconciliation of subject and object, human and nature, spirit and matter, conscious and unconscious, intellect and soul”. In his book, *The Brain that Changes Itself*, Norman Doidge elaborates on the science of ‘neuroplasticity’ when he refers to how Buddhist meditation helps patients become less obsessive and reduces stress, and how meditation can physically reshape our brain (Doidge, 2008:171, 256, 290). This separation of science and spirituality arises because of our lack of a “deeper interconnectedness” (Scott, 2002:28).

According to Wright (2014: “Video lecture 1”), “they [feelings] are not necessarily truthful guides to reality and indeed that we should be sceptical of some of the thoughts and perceptions that feelings foster”. For me, this is a profound point to contemplate. I undertook the Herrmann Brain Dominance Instrument test in the middle of 2012. My results revealed that I tend to submit to my feelings in regard to my thinking preferences. I do believe that through ‘training’ the mind, the illusion that (negative) feelings create can be eliminated, resulting in a clear vision of the truth and thereby eliminating suffering. Since I realised this, I have tried to train my mind to reach a clearer vision of the truth. In his international bestseller, *Thinking, Fast and Slow*, Nobel Prize winner, Daniel Kahneman, refers to this as system two, overriding system one, where the false impression of feelings should not stand in the way of seeing things clearly and making the right decisions (Kahneman, 2012:21).

Frankl (2008:8) declares that although you cannot take control of external happenings in life, you have an internal control over your feelings that determines how to respond appropriately.

10.2 How can I testify to my mindfulness?

This important question relates to the entire literature study. What has been presented here is not reality but simply a written representation thereof. However, even this is not completely true. Although I have experienced some of what has been written above as a student, it is fundamentally only a construction of my interpretation of reality. However, I am searching for the truth, and this contributes to its pursuit.

The truth is important to me. How should I mind? Gardner (2008a, 2008b) gives us an indication. His research has resulted in the identification of five minds for the future that we will need in the 21st century. He maintains that “education is fundamentally about values, but we have a great deal of difficulty about values”. It appears that it is very difficult to agree on values in not only education, and

"therefore, we simply don't talk about values" (Gardner, 2008a:21). So, if education is fundamentally about values about which we do not dare to talk, our practice of education may not be regarded as education. Similarly, Claxton (2012:para.1, 2) claims: "We live in a morally bashful age" despite the fact that "[e]ducation is essentially a moral enterprise. Whether overtly or covertly, every aspect of a school system is riddled with value judgements". But, we disguise the actual underlying moral questions through words such as 'standards' to maintain the appearance of neutrality in order to avoid the inevitable consequences of the judgement.

Claxton's (2012) admonishment about morality and Gardner's (2008a) research about values are closely associated with another of Gardner's research projects called 'The Good Work Project', which states that it is imperative that all work should be good. This is defined by the three E's – **Excellence:** in a technical way and in its broadest sense; **Engagement:** in a way that makes the work personally meaningful and subsequently so inspiring that time and money occupy secondary considerations; and **Ethical:** in ensuring that one's behaviour does not affect others adversely and in always doing the right thing even if no one is watching (Gardner, 2008a:28). Within this context, Gardner's five minds for the future are the instruments through which good work can be accomplished:

1. The *disciplined mind* does not refer to the content of an academic discipline or field or subject, but to the discipline with which the mind is employed to ensure that technical excellence will be achieved, and to ensure the maintenance of such a mind.

2. The *synthesising mind* is the ability to see the big picture, the whole of reality and how that which is the subject of focus, now relates to everything else in the big scheme of things so that nothing important escapes consideration.

3. The *creative mind* creates something that is truly creative and even though it may be something playful, it innovatively interconnects the vast experiences of the creator in surprisingly new, original, unconventional but always life-enhancing ways.

4. The *respectful mind* is a mind that respects others for who they are as human beings – irrespective of differences. This means that everyone deserves a place in the sun and should be respected. But the respectful mind does not end there. It is also about respecting things belonging to yourself and others. Even if an object seems to have little value, it may be invaluable to the owner.

5. The *ethical mind* does not refer only to the duty to fulfil your responsibilities to society, but also to the duty to ensure that you always do the right thing irrespective of time, place and circumstances, which is a tall order. (Gardner, 2008b:4-17)

I have applied the five minds of the future in terms of the values they portray in my work. Similar to Gardner (2008a:27–28), I may not necessarily have been successful, but I have invested maximum effort in this task. However, in my self-management throughout this construction, I became acutely aware of what I do not know and, therefore, what could not be included here. Hence, I may not be able to provide satisfactory answers to all your questions about my construction, and in fact, you may be much more capable of such a construction. What may be more contestable regarding my construction is its somewhat utopian inclination and philosophical perspective.

In this regard, and in view of the general failure of education – even at the basic level of acquiring knowledge and skills – I recall what Paul Hawken (2009:para.2) said to the graduates of the University of Portland. When asked whether he was optimistic or pessimistic about the future, he replied that his response was always the same and was valid even if education was part of his reference to science:

> If you look at the science and what is happening on earth and aren't pessimistic, you don't understand the data. But if you meet the people who are working to restore this earth and the lives of the poor, and you aren't optimistic, you haven't got a pulse. (Hawken, 2009:para.6)

According to Ray (1999), the pulse seems to include the assumption of consciousness as being causal, a basis of wholeness and system thinking, with a dependence on inner wisdom and authority rather than on the senses and outer proof as in the current dominating paradigm. Rather than believing it only when we see it, the emerging viewpoint seems to be that we will see it only when we believe it, thus shifting the locus of control from the outside to the inside.

However, it seems as though even where such a belief does not exist, the spirit of the human being cannot be contained. This is proved by reports about the incredible accomplishments of successful self-teaching of illiterate, impoverished children in a remote village without facilities, infrastructure, a teacher or a school (Mitra, 2005; Mitra, *et al*., 2005; Mitra & Dangwal, 2010; Mitra, 2012).

This provides evidence that the challenge of my research is to determine what it means to be an authentic student, regardless of the level of learning, what is to be learnt, the socio-economic level of the student or the location of the student. Fortunately, I have been encouraged to believe that this is possible. The research of Newmann, Marks and Gamoran (1995:1, 8) found that

> [S]tudents should become 'active learners' capable of solving complex problems and constructing meaning that is grounded in real-world experience … It emphasizes that all instructional activities must be rooted in a primary concern for high standards of intellectual quality. We refer to this conception as authentic pedagogy … As to the

> effects of authentic pedagogy on students with different backgrounds: We found that authentic pedagogy helps all students substantially.

Even though I have used the five minds for the future for my self-management while producing this work, I would respectfully like to replace the label 'mind' with 'consciousness' – the source of all meaning, value, potential and purpose in our lives.

Paul Hawken's (2009:para.2) challenge to the graduates of the University Portland to determine what it means to be a student indicated a fundamental imperative: "We need a new operating system". Hopefully, this work alludes to this. The new operating system seems to be an independent, individual, self-managing student guided by the consciousness of the centre of the authentic self. And since my study is based on the philosophy of Heidegger (1968:15), it is appropriate to consider my quest to discover what it means to be a student in the contemporary world in terms of his/her perspective on education: "The real teacher, in fact, lets nothing else be learned than – learning. His conduct, therefore, often produces the impression that we properly learn nothing from him". However, these are only points of departure for pursuing how to *be*.

Dimitrov (2003:500) maintains that "no thing and no being can exist in itself or for itself but only in a dynamic relationship with other things and beings".

Rowson *et al*. (2012:4) suggest that we should cultivate curiosity, the basis of education, by promoting awareness and mindfulness and, therefore, we should be

> Teaching for the development of competencies and dispositions like curiosity as a goal of learning, rather than merely as a collateral benefit; Encouraging forms of mental attention, including mindfulness, that make us more curious about things we previously hadn't noticed; Promoting focal awareness and vital engagement i.e. giving people a chance to learn something in considerable depth; Experimenting with keeping learning outcomes open to make learning more exploratory; Encouraging reflexive awareness of students' own natures and learning patterns; Remaining vigilant about the impact of screen-based technologies on different kinds of curiosity.

11. Community of truth

The quality of a community – however large or small and however constituted – is determined entirely by the quality of its members. Being part of a community therefore implies an inextricable prerequisite tied with an inescapable ethical imperative: a continuous accessing and utilisation of my own individual inexhaustible power and potential in pursuing my own authenticity. But this ethical

imperative has only one purpose: to utilise the power of the deepest joy that my individual efforts of becoming is generating for fulfilling the purpose of the community of truth; and to challenge individuals in the community to pursue their own authenticity – and inadvertently also mine – to the benefit of the community as a whole. The work of the community of truth is, therefore, as significant, effortful and special as the work that the individual has to exert for the same purpose, but the reward is guaranteed – the deepest joy. Frankl (2014:xvii) confirms this by saying, "one [human being] confronts the other with logos, that is, the meaning of being".

As indicated previously, the construction of knowledge (skills, values) in this preliminary literature review was done in such a way that I have sufficient confidence to continue with my research despite my acute awareness of the insufficiencies, exclusiveness and uncertainty it may contain. I have pursued the truth – as explained by *aletheia*. However, there may be other equally contestable constructions of 'the same' reality. In fact, Palmer (1998:104) says:

> [I] know of no field, from science to religion, where what we regard as objective knowledge did not emerge from long and complex communal discourse that continues to this day, no field where the facts of the matter were delivered fully formed from on high. As obvious as the fact that absolute objectivism cannot be achieved, neither can we be satisfied by debilitating relativism.

The firmest foundation of all our learning is the community of truth itself. The community of truth is, according to Palmer's (1998:104) definition, our commitment to "the eternal conversation about things that matter, conducted with passion and discipline". It is a community where we willingly expose our observations, interpretations and constructions of reality for testing by the community and to return the favour. This is best done through conflict – always open and sometimes even raucous, "a public encounter in which it is possible for everyone to win by learning and growing" (Palmer 1994:103) through complex patterns of communication: "sharing observations and interpretations, correcting and complementing each other, torn by conflict in this moment and joined by consensus in the next. The community of truth, far from being linear and static and hierarchical, is circular, interactive and dynamic" (Palmer, 1994:103).

But since the focus of our conversation is always on reality itself, it calls us deeper into its secret, always ready to take us by surprise, rejecting our blurry observations and false interpretations with demands to pursue its authenticity and ultimately refusing to be reduced to our finite conclusions about it. And since even the community of truth can never offer us ultimate certainty because such certainty is beyond our finite hearts and minds, our willingness to submit *ourselves* to its scrutiny ignites our primary motivation, the search for meaning and the will to learn. This compels us to transcend to the higher levels of our being where our authentic wisdom reveals the intimate secrets

that are eluding us (Palmer, 1998:99-110). With the inseparable constituents of the integrity of our human individuality simultaneously operating in unison, we are rewarded with – the deepest joy.

With this said, here I am in the midst of this community of truth under your scrutiny.

APPENDIX C: CODING – EXPERT INTERVIEW ANALYSIS

After analysing 15 interviews, the data became saturated, and six main categories emerged (as presented in Chapter 9 of the thesis). Main categories are constructed as follows: Upon assigning codes to the data (a descriptive word(s) explaining the data), certain codes can be positioned together based on similarity to form a category. Saldaña (2016:14) further explains that "[s]ome categories may contain clusters of coded data that merit further refinement into subcategories." Saldaña makes use of refinements such as subcategories containing clusters of coded data refined into *sub*-subcategories (Saldaña, 2016:225). The model of Saldaña (2016:14) is presented on the next page.

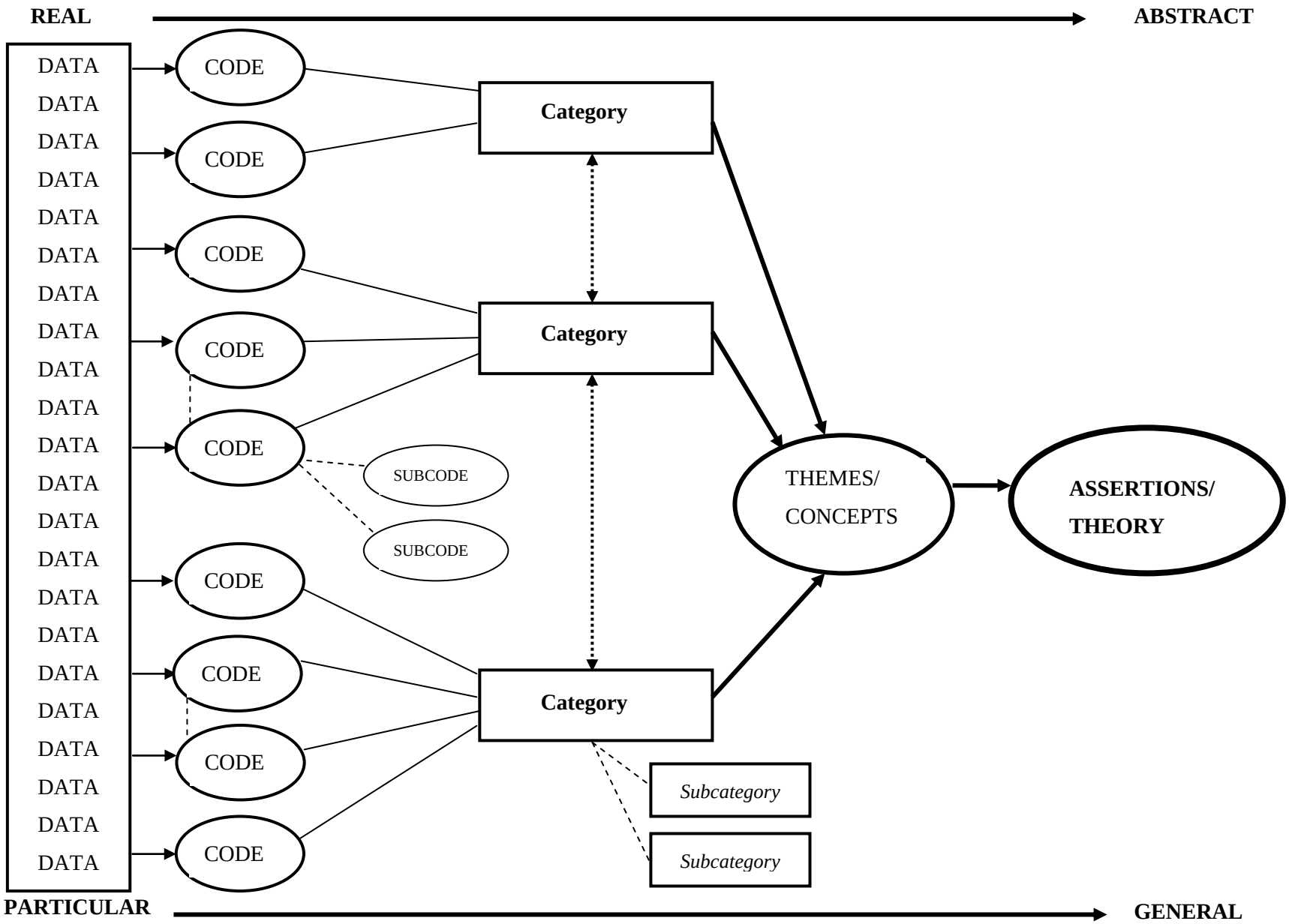

Figure 14: A streamlined codes-to-theory model for qualitative inquiry

Source: Saldaña, 2016:14

I could also start identifying subcategories and/or sub-subcategories containing their respective codes and/or subcodes (subcodes are codes clustered together to form part of the code) or even possible sub-subcodes within the first 15 interviews.

As I continued with the analysis of interview numbers 16–29, I remained mindful of possible emerging subcategories and/or sub-subcategories containing the respective codes and/or subcodes. Saldaña (2016:13) explains that subcodes "are specific, observable types of realistic actions related to the codes, while … categories … are more conceptual and abstract in nature". I constructed a simplified model of the above explanation to show visually how a main category can be refined:

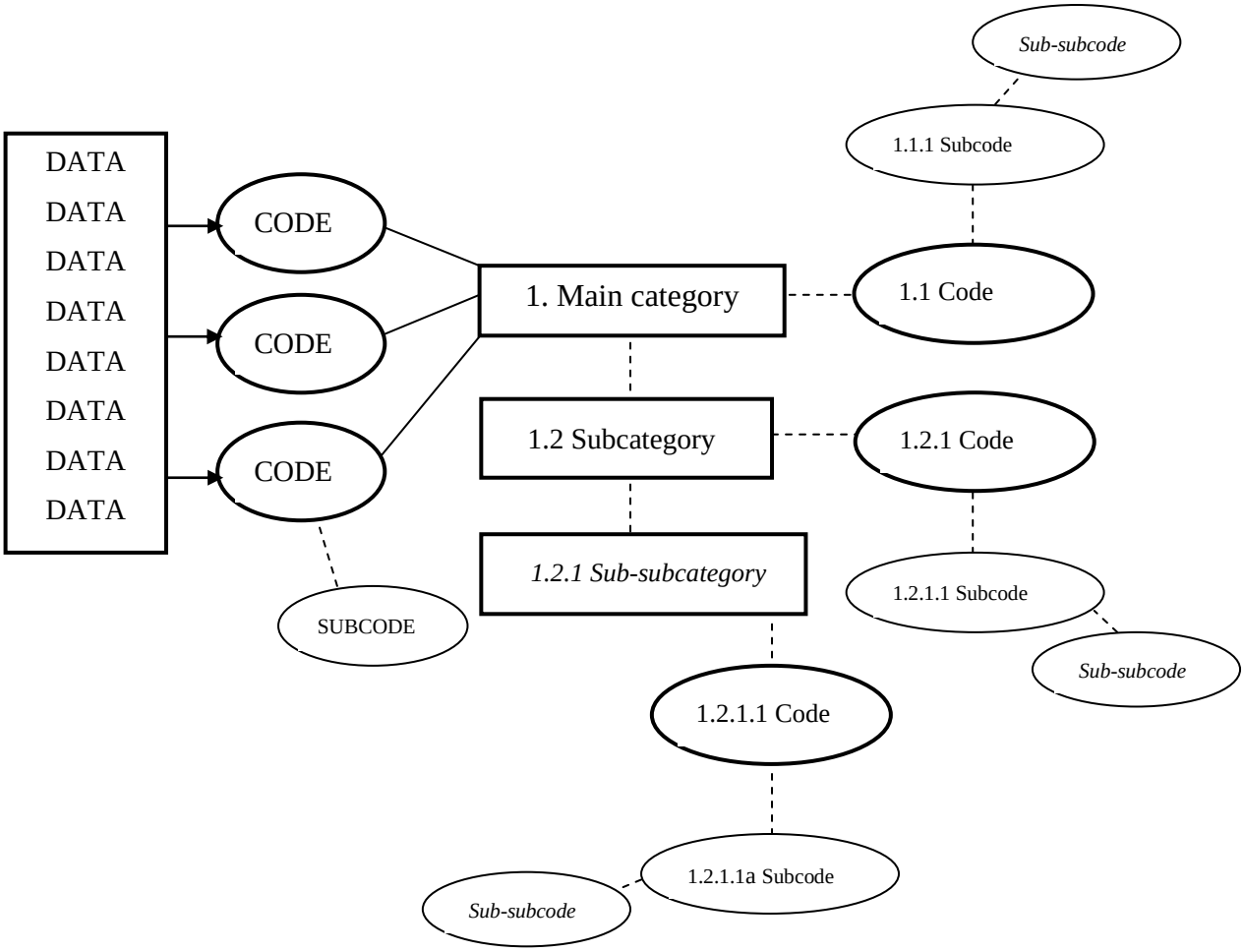

Figure 15: A simplified model to show how a main category can be refined

The analysis steps

The analysis steps are divided into two phases and are presented below.

Phase one

For each respective transcript, the following actions are performed:

1. Read through all the transcripts.
2. Read through a specific random transcript.
3. Carry out initial coding within the randomly selected transcript to "take ownership" of the data (Saldaña, 2016:115) with no specific method. Saldaña claims "[i]nitial coding is not a specific formulaic method".
    a) Assign codes to data.
    b) Assign subcodes or even sub-subcodes to data as necessary.
    c) Identify possible emerging categories/subcategories/sub-subcategories within the above data (Saldaña, 2016:115).
4. Repeat step three to re-code in order to eliminate unnecessary codes, to merge identical codes or to group codes to form a category.

Phase two

1. Carry out focused coding, which implies grouping similar codes constructed from the initial coding in order to form categories/subcategories/sub-subcategories. This step may have taken place partly in Phase one (see Phase one, item 3c).
2. Carry out axial coding, a step that is an extension of initial and focused coding (Saldaña, 2016:244). This involves reorganising the dataset by selecting the best representative codes (Boeije, 2010:109). Categories and even new categories may emerge as a result. The relationships between categories and subcategories and/or sub-subcategories are explained by means of their properties (characteristics) and dimensions ("location" of characteristics) (Charmaz, 2014:62, 148). Thus, *interpretation* starts playing a significant role.
3. Carry out theoretical coding, which involves synthesising the categories that emerged from axial coding to form a core category that covers all the categories and codes and, therefore, acts as an 'umbrella' for the whole dataset. A theory can now be constructed (Saldaña, 2016:251).

The steps that I carried out while analysing my data are elaborated below.

Phase one

1. I commenced the coding process by first reading through *all* the interview transcripts in order to start familiarising myself with my participants' views.
2. I randomly chose an interview and read it through to obtain a holistic picture of that specific participant's view. Only then did I commence with the assignment of codes to the data, which entailed the first step known as 'initial coding'. I did this separately for each of the three main questions of the semi-structured interview in order to maintain some structure. The fourth main question was an open question that involved obtaining an answer that could be divided into the answers for question 1, 2 or 3 or a combination thereof. This resulted in adding a code in the form of a word, a phrase or sometimes even a quote to a particular line, paragraph or section of data within the interview transcript. These codes were written down on index cards and thus, each index card contained a code and sometimes a code with subcodes or sub-subcodes. The index cards were stored inside an envelope with the accompanying interview. The index cards therefore represented the interview as a whole.

I selected data to code only if it were relevant to my research. I assigned a code within the specific context within which the question was posed to the interview participant. For example, if participants lost focus during the interviews, I brought them back to the focus point by asking probing questions. This implied that certain data might not have been relevant and, therefore, did not need a code or was initially coded 'by mistake', and I could now eliminate these codes. However, with the first few transcripts, I coded all the data in the initial step of the coding process as a method of acquainting myself with the initial coding process. Therefore, within the context of the question asked, the participant's answers were coded if they were relevant to the question or research topic.

Analysis is a particularly messy process and demands revising the transcripts to see if data to code was missed, if some codes are redundant (not applicable according to the relevance of the research) or if some codes are to be merged to form one code because they are the same. When conducting this iterative analysis process, some codes may become categories, subcategories, or even subcodes to another code or sub-subcodes to a subcode.

Phase two

1. In the case where codes were grouped together to form a category, focused coding took place, and this coding formed part of the second phase of the analysis process. The category was then given an appropriate name, which related to that particular set of codes grouped together.

At this stage, I wrote all the codes on A4 paper, with the codes of each question listed separately. From there, I could see other categories emerging.

2. In some instances, categories were grouped together as their relationship(s) emerged. In such cases, the coding progressed to axial coding, which is also a second phase analysis step. Therefore, for each transcript, the analysis process started with initial coding and was followed by focused coding, which progressed to axial coding.
3. As a result of these steps, all the codes and possible categories of the transcripts could now be examined together. This involved repeating the steps in Phase two and positioning all the transcripts together in order for the last step to occur, which is for the core categories to emerge (theoretical coding) from all the interview transcripts and result in theory development.

APPENDIX D: ORGANISATION OF THE CATEGORICAL MAP

What you will see next are the expert-interview results presented in a table consisting of all the categories, subcategories, and/or sub-subcategories and their respective codes, and/or subcodes and/or sub-subcodes.

Table 1: Organisation of the categorical map with a description of accompanying codes

MAIN CATEGORY	SUB-CATEGORY	SUB-SUB CATEGORY	CODE	SUBCODE	SUB-SUBCODE
CATEGORY 1 **THE CURRENT EDUCATION SYSTEM** From the interviews, it became evident that the current university education represents a typical passive learning *process* in order to acquire a content *product*.	**SUBCATEGORY 1.1** **CHARACTERISATION OF THE CURRENT EDUCATION SYSTEM BY THE MESSAGE IT SENDS** The message, in general, is very clear. Most participants felt that students got the message that they must merely memorise information, provided by a lecturer, and then replicate this when tested. Also within this message, the participants spoke about what they believed the current universities to look like: An industrial model consisting of fragmented modules with fragmented recipes where students need to copy and paste whatever the lecturer provides.		**CODE 1.1.1** **Passive recipients to "be like me" (Participant 12, page 5, line:11)** Participant 13, page 1, line:19-20 *The message – or 'hidden curriculum' – of this kind of pedagogy is clear: To be a student is to be a passive recipient of 'expert' knowledge.* Participant 5, page 6, line:19-23 *… I would say that they are passive recipients of knowledge and … as opposed to an active creator of knowledge, because they're listening to a lecturer give them knowledge and it sort of goes into this empty vessel way of thinking of students, whereas all of the literature points to students already having complex conceptions of how the world works. So just telling them knowledge isn't going to be as effective.* Participant 12, page 5, line:10-16 *The dominant message is one of, as it were, "Be like me". That is, to put it more formally, higher education has become, over the last 200 years, largely a matter of, in the jargon of Pierre Bourdieu, "a matter of reproduction". So, students are expected to, as it were, reproduce the culture in which they find themselves. And academics, by and large, or teachers in higher education in universities have, by and large, seen*		

			themselves as passing on traditions and fields of knowledge, which they've expected students to assimilate. And so, rather relatively passive pedagogical relationships have developed. Participant 15, page 8, line:20-24 *The message that students get is simply, "Go to the classroom, sit there, you will get a lecture and then, you know, you'll write a test or an exam, but the lecture is not so, so important, I mean you just study the stuff from your textbook and, and from your notes, or whatever the case may be, and then you go write the test and exam and then you're finished with the module." … [I]t's actually a very disturbing message.* **CODE 1.1.2** **Recipe learning for one answer** Participant 2, page 2, line:16-17,23-24,30-31 *I think the message that students get, is there's one recipe to the answer or to the question and they need to be trained in finding or being experts, in that one form of recipe to get to the answers they need, and their lecturer has the key to that recipe. So, university is a set of broken up modules where they need to learn an x amount of recipes to get to the one answer that they are requested to give at the end of the year*. **CODE 1.1.3** **Retain and repeat "knowledge dump"** (Participant 7, page 8, line:24) **by "copy-paste"** (Participant 14, page 2, line:6) Participant 9, page 5, line:25-26; page 6, line:3 *… [T]he task of learning is all about, kind of, letting information flow in and then trying to retain as much of that as you can. And repeat it back when asked. … [I]nformation comes from an authority and your task is to grasp it and repeat it back.* Participant 5, page 6, line:23-31 *And then I would also add the assessment portion of that, … especially the memorisation. I think*		

			the messaging there is … that knowledge is stuff. A lot of times it's a kind of stuff you can look up online and that is something that we are challenging, because a big tenet of our work is that technology is changing, fundamentally changing, what the jobs of the future will be and what the needs, individual needs, of the future will be and societal needs. So, all of those will be changing and it'll be moving away from keeping large amounts of information in your head. So that messaging that your function is to keep information in your head in a test is seeing how much information you can keep in your head, that's part of the problematic messaging. <u>Participant 9, page 6, line:4-8</u> *… I think, that learning consists of … or that to be intelligent means acquiring as much information, the world's information, in your mind as you can and then retaining it therein and being able to put it back out when you want. And, of course, while that's going on, everybody in the room, professors and students, both know that that's sort of impossible task as the amount of information increases …* <u>Participant 14, page 2, line:6-7</u> *A student of today means that you are subservient and you are there to copy-paste … what your professor is saying.* <u>Participant 16, page 6, line:11-12,18,24,30-31</u> *Well, the typical model is don't think too much, rather … be attuned, receive, copy down, you know? It's, like, take good notes. Download this information that you're being given. Even if you can't entirely make sense of it at the time, download it and maybe you can make sense of it later …* <u>Participant 7, page 8, line:23-29</u> *… I think the message that students get, is the continuation of to sit and get the professor who'll dump knowledge into the child's mind and there's nothing worthy that I have to think of, because I just have to memorise what you know that you think I should know and then regurgitate it back to you. So, the message isn't "Be a*		

			thinker, be creative, be in touch with yourself and what interests you", it's not even a message of 'You have anything significant to contribute to the dialogue'; and it's not a dialogue, it's a one-way conversation.		
CATEGORY 1 **THE CURRENT EDUCATION SYSTEM (Continue)**	**SUBCATEGORY 1.2** **CONSEQUENCES OF THE CURRENT EDUCATION SYSTEM** Inevitably, because of this system of passive learning, the **consequences of such a system** came forth as follows.	**SUB-SUBCATEGORY 1.2.1** **Neurological consequences** The current education system clearly limits brain function.	**CODE 1.2.1.1** **Neurological consequences as in 'no real learning takes place'** Basically, in such a system, **no real learning takes place** and the executive brain functions cannot, therefore, develop. Participant 1, page 1, line:23-25; page 3, line:8-13; page 4, line:25-28; page 5, line:16-21; page 1, line:28-24; page 2, line:1-9 *… [S]ome things that are happening are lack of personal relevance and lack of opportunities to mentally manipulate new learning so that it can become strong long-term memory. [Thus] … memories that are isolated, rote bits of data that may* *or may not be remembered, and if … they are remembered [they] will be applicable … to a limited degree. They'll be applicable in the way they were learned and tested; so we're go[ing to] miss out on conceptual learning and that means we're go[ing to] miss out on learning that is transferrable, because the goal is not what students know, but what they can do with what they know.* *There's also the lack of opportunity for executive functions to be activated and active in thinking about the meaning, the validity and future value as well as the big concepts of learning when the message is there that one person provides it and they are receiving it. The executive functions include things such as intentional focusing of attention and avoiding distraction, emotional self-management, judgement, reasoning, critical analysis, cognitive flexibility, the ability to understand different opinions and perspectives, collaborate and innovate, … media literacy … and organising and prioritising, planning are also executive*		

			functions. *So … they [students] aren't getting to activate and stimulate and build up their brains' neural networks of executive functions, which are still highly responsive, because they're going through their very rapid responsive maturation and development phase through the mid- to late-twenties. And it's a wasted opportunity not to activate and engage these developing neural networks during this time of heightened response, because neural plasticity shows us that it's activation of networks, it's the rethinking about information, applying information, using it, that sends the electric current through the circuit of information and, with each activation, the circuit gets stronger, gets stronger in the sense that the brain's response to activation through a memory or a skill circuit, and [with] skill circuits I mean those developing executive functions …* *All those networks need to be activated, especially during these heightened response years for them to maximise their neural plastic response when they are so ripe for that. This doesn't mean that they can't be strengthened through neural plasticity throughout life, they certainly can, but it's during the rapid response maturation years in the prefrontal cortex, where the executive functions are, that they have even a higher rate or response to their being activated.* This participant clearly highlights the necessity of activating brain functions: There are accelerated demands on the executive brain functions in the age we are living in, compelling us to "*activate and engage these developing neural networks*." (Participant 1, page 1, line:32) <u>Participant 1, page 3, line:30-33; page 2, line:17-20</u> *If something can be outsourced, done by technology, done repetitively by a device or a computer, it will be. So, the demand for rote, passive acceptance, regurgitation in the same way is … not going to qualify today's graduates for jobs.* *So, the opportunities have never been so profound for students in schools and universities*		

			now because of the volume of information, the increasing accuracy of technology, with its increasing accuracy of facts and increasing access to information through globalisation and technology. **CODE 1.2.1.2** **Neurological consequences as in limited brain development** The years of optimal brain development are wasted as **the brain is imprisoned**. Participant 1, page 3, line:33-34; page 4, line:1-2 *In addition, that type of learning experience [passive learning] is very costly. It costs time, precious years when the brain is peaking in many areas and can benefit by explorations and curiosity, interaction and expanding its boundaries. So, it's costly to wrap up these years and confine the brain with passive information doled out.* **CODE 1.2.2.1: LACK OF SKILLS** **The students lack not only the hard skills used in practice, but even more distressing, they lack the soft skills.**	**SUBCODE 1.2.2.1a: HARD SKILLS** Participant 15, page 12, line:19-23,29-30 *… [I]n the research that I've come across, not only is it found that the students lack … the practice of what their education was all about – they lack the practice. In other words, I'm talking about … the discipline that they were involved in. So, they might have a lot of knowledge and … I must say I think the technikons and those kind of institutions might be quite better than this in the sense … that they have a period of time where students really need to be in the workplace and do stuff there. So … that might be … a good thing.* **SUBCODE 1.2.2.1b: SOFT SKILLS** Participant 15, page 12, line:30-31; page 13, line:1,7,13,19-20 *But the other thing which is much more disturbing, is that, and this is all over the*	

		SUB-SUBCATEGORY 1.2.2 **Future consequences in terms of development for the world beyond university** It is also evident throughout most interviews that the students are dependent on the lecturer's thoughts and ideas, leaving the students **unequipped for the world's demands** and, therefore, they are not prepared for a life after university.	**CODE 1.2.2.2: LACK OF SELF-DIRECTED LEARNING** **The students cannot think deeply or solve problems.** <u>*Participant 7, page 9, line:30-31; page 10, 1-3,9-16*</u> *… [I]n the undergraduate major I don't think our students are equipped for the world that demands that we be self-directed learners. So, I think we are not equipping students to be deep thinkers and problem-solvers; I think we're teaching them to take what they've learned in classrooms, whether it's kindergarten, eighth grade or undergraduate programmes and follow a leader that tells them what to think; and I don't think we're equipped for problem-solution based thinking.* *Consequently, we find our world and ourselves in a mess and we find our businesses following the same model. It's such an insidiously imprinted model that we're not raising thinkers, we're raising followers. And I don't think we're equipped for what this world or the Internet – as I talked to a friend in South Africa – and these permeable boundaries that are set through the Internet and the demand that you are self-educated – it's not what you know, it's not even what you know that matters in this world we're moving into, it's what you do with what you know and how you update your knowledge continuously and synthesise multiple ideas to come up with a new way of thinking of the solution.*	*place, research is all over the place, that the students simply lack the soft skills. And those are communication … a self-discipline, self-management, working in teams, perseverance. And you can go on to all those basic, basic, basic skills. I'm not even talking about twenty-first century skills. I'm not even mentioning that.*	

			CODE 1.2.2.3: LACK OF EVALUATION AND COGNITIVE FLEXIBILITY **The students lack information literacy and cognitive flexibility** Participant 1, page 6, line:22-26 *And you'll see that the passive classroom experience, with the one information, one response, one test, is absolutely not preparing students for the twenty-first century and their need to have information literacy, to evaluate what they hear, see, find on the Internet, read and evaluate it for validity, for value and … have the cognitive flexibility to adapt to its frequent changes.*		
CATEGORY 1 **THE CURRENT EDUCATION SYSTEM (Continue)** From the interviews, it became evident that current university education does not prepare students for their future life, in fact, it only limits brain function and make the students dependent on the lecturer's line of thought. Another noteworthy consequence is that students lack soft skills such as self-management. This results in a **concern** that the student behold in terms of his/her **investment** in a university education or degree. Thus, according to the participants, the students are concerned about their investment, in **time and**	**SUBCATEGORY 1.3** **VALUE OF INVESTMENT IN UNIVERSITY** Participant 1, page 4, line:8-14 *… There are lots of benefits to attending university that are there beyond the classroom, … collaboration, opportunities to be with others, to have access to faculty with different expertise. All of those are great as part of a learning experience. However, they can't always be considered worth the bang for the buck with the high expense of attending university today and if what someone's going to get from university is passive doling out of information that they're then asked to memorise and respond back to on tests, then is it really worth it?*		**CODE 1.3.1** **Meeting expectations** Participant 4, page 8, line:24 *So, I would say number one is, "Is this experience going to meet my [the student's] expectations?"* Participant 4, page 8, line:28-31 *… "Am I going to create, am I going to meet people, am I going to develop a network that will help me as I pursue my career or pursue my future? Is this experience in higher education going to help me, not just in terms of preparing me to work, but in establishing networks for me?"* **CODE 1.3.2** **Time and money** Participant 4, page 8, line:25-27 *… I think you have to admit, is, "Is it going to be worth it? Is this four-year degree going to be worth the money that it's about to cost me? Am I going to get a return on investment for my higher-education experience?"*		

money, in attending university and they wonder about how their expectations, networks and relationships will help them with their careers.			Participant 9, page 7, line:24-26, 31; page 8, line:1-3 *The major concern today, and I presume that this is true around the world, because I certainly know it's true here in the US for higher education – it's gotten very expensive – and that concern is, "Will being here be worth the investment in time and money?" Literally, does it make sense? … I know that that's a concern of students – probably much more so today than even ten years ago – is to whether doing all of this and paying all of this money, if it's expensive, will really be worth it in the long run, or should … if they should be making some other investment with their time.*		
CATEGORY 1 **THE CURRENT EDUCATION SYSTEM (Continue)** These concerns lead to the next subcategory, **considering a current alternative**. The interviews show that Internet universities seem to be very convenient, however, we are also warned against learning in isolation in the sense that you are physically removed from other students.	**SUBCATEGORY 1.4** **INTERNET UNIVERSITIES AS AN ALTERNATIVE** With the rise of Internet universities, pros and cons need to be considered.	**SUB-SUBCATEGORY 1.4.1** **Pros of Internet universities** An advantage these universities have, is that they provide instant access to limitless information, where the student can learn in his/her own time.	**CODE 1.4.1.1** **Anytime access at all times** Participant 1, page 4, line:15-26 *If the information is just going to be passively doled, then, if you're acquiring it online, you'd be able to sit, listen to the information on your own schedule. That would be useful for people who need to work during the times of university courses or do childcare. And why not have it on your own schedule, since it's going to be the same thing, whether it's online or out of the professor's mouth? And the other advantage perhaps … if that's all there would be in a lecture, then why shouldn't the online experience take place with context? Learning is much more memorable and usable when it's relevant. So, if the university lecturers were part of an online programme, then they could be guided –learners could be guided to … to internships, or mentoring, or jobs, or other resources that take the information that they're being lectured on and make it relevant or give them a chance to use it or to explore actively the application of the information in their arts or in their fields of interest.* Participant 9, page 9, line:2-9 *… What I think on that, is I've been paying attention to … the great rise and the massively*		

		SUB-SUBCATEGORY 1.4.2 **Con of Internet universities** This alternative option for students has its own challenges. You cannot take human interaction away from a learning experience by learning in physical isolation.	*online learning courses of the last – what? – five to seven years or so, and the rise of the Internet universities, like, you know, (and I can't even remember their names), Coursera and others, and it's undoubtedly true that students have much better access to information, just as we all do, and therefore, the bright side of that …, even indirectly, we're learning that the task of education is not to try to remember everything, but to know how to access it when you need it. And so, that's a very good thing, because that mimics the rest of our lives.* **CODE 1.4.1.2** **Limitless information** <u>Participant 9, page 9, line:10-11</u> *… [W]e can all find information when we want to, we can learn things when we want to, so we're learning indirectly all the time, much more than we ever were, when we were years ago.* **CODE 1.4.2.1** **Learning in isolation** <u>*Participant 10, page 16:25-30; page 17, line:5-9,21,27*</u> *… I did my doctorate online and I did it online because I wanted to experience online. I've studied every way it's possible to study. I studied full-time, part-time, distance, correspondence, night classes and then I did my PhD online … And it was the least satisfying experience. So, I got the knowledge, … I worked as hard as I'd worked for my other degrees, but not having that interaction with other students, was a huge missing part of education. And I think that anybody who thinks that education is going to be something that can be entirely self-directed, that can be done entirely in isolation, I think has misunderstood what education is … Part of education is socialisation, and part of education is interaction, and part of education is collaboration. And so, … those are also, I think, critical skills for the world that we find ourselves*		

			in – our ability to collaborate, to engage, to connect. So, your emotional intelligence affects both your self-awareness as well as your connections with other people.		
CATEGORY 2 **TECHNOLOGY** Technology plays such an immense role in our lives today that it is inevitable to assign this as the next main category, as it featured strongly throughout the interviews.	**SUBCATEGORY 2.1** **THE USE OF TECHNOLOGY IN GENERAL** At this stage, what emerged from the interviews, was the use of **technology in general**, and many participants agreed that it can be used for "good or for evil" (Participant 5, page 8, line:1), to free us or constrain us. An understanding of philosophy principles will help against technology abuse. The technology itself does not have a "value judgement"(Participant 5, page 8, line:4) and it can be either used to enslave us, or liberate us. From the interviews, we can therefore tell that ethics play an immense role when it comes to how technology is used.		**CODE 2.1.1** **Technology can enslave us** *<u>Participant 5, page 7, line:31; page 8, line:1-4</u>* *… [W]ith every scientific breakthrough and technological breakthrough, it can be used for good or for evil, and that's kind of an oversimplification, but it can be used in different ways and some of them will be constructive, while some of them will be destructive. Technology itself, progress itself, does not, doesn't have a value judgement.* <u>Participant 11, page 13, line:29-31; page 14, line1-5,11</u> *The dark side of technology, is that it can be used to enslave or subserve human beings. And I think the danger is of governments and other organisations having access to technology which can enslave people. One technique, which seems to be being used by certain governments at present, is to convince people that their safety, their security, is at stake and, in the process, limiting civil liberties. Famous saying by President Abraham Lincoln was that those who are prepared to sacrifice liberty for security deserve neither. I think that's an important concept, going forward. That individual human beings need to maintain their individual liberties, even though there are security concerns, going forward. Technology can be used to severely undermine this individual liberty.* *<u>Participant 7, page 17, line:25-27, page 16, line:26-28</u>* *The dark side is … it's another way to control us and find out exactly what we're eating for breakfast, exactly where we're living, exactly when we're walking in and out of our doors … We fall easy prey to people who are ill-intentioned, particularly with children, not so much with adults. But I do think we become very*		

			distracted and fragmented and it could be another medium to control the way we think. **CODE 2.1.2** **Technology can liberate us** <u>Participant 16, page 16, line:24-30; page 17, line:2-11,17-29; page 18, line:2,8</u> *I believe technology can be a great liberator, but it can also be used to shackle us, potentially, as well. I think this is why having a good understanding of philosophy, particularly the first principles of philosophy in terms of non-aggression and universalizability. These are things that aren't taught very well. And people that decide to go and study philosophy, even the field, you know, we think of, you know, dusty beardy-weirdies discussing the most arcane and boring things that have very little relevance to real-life. I think that needs to change.* *Philosophy really started in the forum, you know; people just having a public conversation, essentially. And we now have wonderful opportunities to return to that, but the forum can be online, it doesn't necessarily need to be in a geographical place. I think there are some great examples of people engaging in philosophical discourse now on the likes of YouTube or on blogs and things like that. And I think that that can have [an] incredible influence on people's real lives … I do think that having a good understanding of the really important philosophical principles is key to developing technology that is less likely to be abused, or in helping to protect oneself against the abuses of technology.* *I also think that things like cryptographic technologies are also essential liberators. Things like Blockchain and Public Ledger, they can help secure property rights for people who have very little legal franchise, for example. You can prove that a certain document existed at a certain time, which is one of the bigger problems in some of the developing parts of the world, where, you know, you may have a document that says you own a house and it's filed at a local repository and somebody rips it out and you have no*		

			recourse. You know, and somebody else can appropriate your property. Or, for example, the disasters in places like Haiti, a lot of the records just disappeared from public records offices, you know, of land registry and that sort of thing. So, I think that cryptographic technology and public ledges can help to protect people against predation and against disasters in wonderful new ways.		
CATEGORY 2 **TECHNOLOGY** (Continue)	**SUBCATEGORY 2.2** **ARTIFICIAL INTELLIGENCE** The role of **artificial intelligence** (AI) also surfaced to show two things. From the interviews, it became apparent that most jobs as we know them will be (and some already have been) replaced by AI, however, the human agent will still be irreplaceable, as humans must control machines by operating them. The incredible difference between humans and machines is that machines do not have cognition.		**CODE 2.2.1** ***" [M]achines are now able to replicate most tasks that a human can do in about one second or so"*** (Participant 16, page23, line:12) Participant 11, page 8, line:16-19 *I think the role of artificial intelligence is going to increase far beyond what we think is currently possible. And the possibility is that artificial intelligence could, in fact, replace most professions as we currently know them. This is why I emphasise that adaptability in the future is extremely important.* Participant 16, page23, line:9-16 *There's been a lot of developments within the field of machine learning and AI in the past couple of years. However, although we describe these areas as artificial intelligence, in many ways it might be better described as artificial intuition, in the sense that machines are now able to replicate most tasks that a human can do in about one second or so, or a series of tasks, such as understanding the objects in a scene or making a prediction of what's going to happen next. Those kinds of fast, intuitive tasks that most of us do without really thinking too much. That's what machines can do at the moment. And anything that can be predicted in a meaningful way, machines are already, essentially, superhuman at doing.*		

			CODE 2.2.2 **"What we [they, as machines that we built] don't have, really, is cognition"** (Participant 16, page23, line:17) <u>Participant 11, page 10, line:30-31; page 11, line:1-3</u> *As far as we know, there's no computer which, as yet, had a conscience or can make truly innovative decisions. Computers are very good at doing massive calculations and providing correct data is fed into the computer, and the information being requested of it based on that, computers can make good decisions. However, this is still critical – the data fed in – and what is available to the artificial intelligence. So, the human interface with that, I think, is still critical.* <u>Participant 16, page23, line:17-19,25-28</u> *What we [they, as machines that we built] don't have, really, is cognition. True artificial intelligence in terms of … reasoning, the slow thinking about stuff, or abstract reasoning. This is a long way away. It may be not too long away, because I think a lot of the recent developments are actually going to accelerate this process, but it will require new technology that doesn't really exist yet in order to have true abstract reasoning within a machine intelligence.*		
CATEGORY 2 **TECHNOLOGY** (Continue) In relation to all of the points mentioned, several participants argued about the **pros and cons of the use of technology** as featured in communication, brain function and the use of it in the classroom.	**SUBCATEGORY 2.3** **TECHNOLOGY INFLUENCES** From the interviews, it became evident that technology is not the solution to any problem and that it must be used with mindfulness, only as a tool. The focus of education should be on the highest quality of learning (and not technology), compelling the student to work hard to solve a challenge to reach insightful understanding. We are also	**SUB-SUBCATEGORY 2.3.1** **Communicating** One main use of technology nowadays, is to create communication devices.	**CODE 2.3.1.1** **Pros of using technology in communication**	**SUBCODE 2.3.1.1a** **Technology can provide a wonderful communication tool if you are in control of it** <u>Participant 7, page 16, line:12; page 17, line:5-8,14-18</u> *Being able to dialogue with you – this is a great side of technology … So, what I'm going to do is I'm going to use technology productively, I do know about Google, I do know about Google Hangouts. I can probably turn this around in a second to contact you, to invite you into Google Hangout, which is how we're talking. So, that's I think a very*	

	clearly warned specifically about the addictive nature of technology that can automate us.			*deliberate use – I'm controlling technology now, … I'm not being manipulated and afraid, and I'm not eating hours of time doing something that's not productive. To me this is interesting. I love that you're doing this study and the more people like you we can get to put your voice out there, to paint models, that's awesome, I want to support that, so I think … the best of technology … could've been used within the last 15 minutes by me.*	
			CODE 2.3.1.2 **Cons of using technology in communication** Technology has **the ability to remove us** from society, resulting in an explicit change as well as a decline in having face-to-face conversations with one another – even when we are physically together in a communal space, because we prefer to seek screens.	**SUBCODE 2.3.1.2a** **A decline in face-to-face communication** Participant 9, page 10, line:1-23, 29-30 *The downsides are pretty well-recognised, I think … They are, number one, a potential decline, and certainly a significant change, … in the kinds of social skills that we have. And as a futurist in front of all kinds of audiences, I get asked this all the time, you know, "Is our ability to look at each other and talk and have conversations declining because of spending so much time online?" And the answer to that is probably, "Yes", it probably is declining a little bit.* *My academic field was communication, so I was very focused on that, and my academic research back when I was in that was the question of 'How will computer networks change human communication?' That's what I focused on in my research and … the publications that I did … [M]y conclusion at that time and still is that it would just be an evolution in terms of how human beings communicate. Just as we evolved away from passing on our knowledge by telling stories around a campfire, which was the traditional form of education way back in the day, and then we invented writing, and books, and so on, and that became how we passed information, and now we'll evolve again, so. But there is some downside in that many people will spend the vast majority of their time looking at screens, typing a few words, watching videos and so on and not being out*	

		SUB-SUBCATEGORY 2.3.2 **Neuroscience** We are warned seriously about two things: **to avoid becoming automated** in our actions and so digitising our memories, and **to avoid becoming addicted** to technology and trying to get quick fixes by multitasking between products that technology can offer, as this not only affects the physical brain negatively but also our spiritual lives.	**CODE 2.3.2.1** ***"[T]he most dangerous thing about technology today is that it's making memory digital"*** (Participant 8, page 7, line:25-26) <u>Participant 8, page 7, line:22-31; page 8, line:1-6</u> *There's nothing inherently wrong with technology, but, like anything else, when technology is applied in a way that is mis-measured or unmeasured, in other words, when you have an excess of it, it becomes very dangerous. And the most dangerous thing about technology today is that it's making memory digital; people don't want to remember things anymore.* *So, we're relying on computers and cellphones and iPads and things like that to remember things. And yet memory is very important in the paradigm of man, because memory has to do with consciousness and, if we make memory mechanical or digital, then we are, sort of … almost abdicating our own consciousness. Our consciousness, instead of becoming present and in the moment, starts becoming digital. And our whole behaviour pattern starts becoming mechanical. And we look at things reactively,*	*interacting. And that includes when we're in public spaces; as we all know if you go into any public space a significant number, often even a majority of the people there, are, you know, they're looking at their phone (this is a phone, right – my hand is representing a phone) and they're like this and not actually seeing anything of anybody around them. And so … over time, and by that, I mean probably decades of experience with this, we'll adjust to that and develop some new medium, some new balance point between different kinds of communication.* *All of that … does not include the newest thing, of course, going on, which is the emergence of virtual reality technology. And the ability to be sort of even more immersed in virtual environments and that could have another impact all on its own.*	

			instead of proactively. So, technology, in itself, is not a bad thing; it's provided us with many tools through which we can cope and, certainly that's increased our efficiency and, in many ways, our effectiveness, but we have to be very careful that it doesn't make us mechanical beings. In other words, that it doesn't cover consciousness and make memory digital. Memory is an important tool that the human being has to cope with all the pressures and all the difficulties that they're faced with. **CODE 2.3.2.2** ***"Numbing of the pleasure centre"*** (Participant 17, page 6, line:27-28)	**SUBCODE 2.3.2.2a** **One can get addicted to technology in the same way one gets addicted to cocaine, resulting in a *"numbing of the pleasure centre"*** (Participant 17, page 6, line:27-28) <u>Participant 17, page 4, line:10-34; page 5, line:20-33; page 6, line:1-18,24-33</u> *I think, and I'm speaking from the world in which I live in. As an educator, one who's taught at the university, one who now talks a lot about digital addiction, which is [an] epidemic globally. I globetrot quite a bit … so what I would say to students is that … they need to be aware of the addictive nature of what's in their pocket because it has been the single biggest interruption and it's not been so much the porn and the gaming as it has been the multitasking, which is, in Neuroscience, we call that switch-tasking. So, what has happened, is the grades have gone down in schools where one-to-one laptop and tablet programmes have been implemented. So, I find myself in those circles quite a bit, because the marketing and the advertising that says, 'in order for your child to be successful later in life, you must give them the latest and the greatest and the younger the better.' Well, the empirical evidence is not working out the way the marketing team said that it would. So, we have to look at the cognitive breakdown and it is exactly what happened*	

				as a result of the switch-tasking. So, it's not their IQ. These students have the ability to be about as smart as they want to be, but how they're interacting with the technology is affecting the brain, the grades are going down. So, what I would like to be, make them aware of, is the addictive properties of multitasking, of what's in their pocket. *But there comes a point in which denial sets in because, once addiction sets in, with anyone, whether it be the cocaine, whether it be alcohol, whether it be the screens, we don't believe that we're truly addicted. We can overcome it or we can handle it. We can understand why our friends can't handle it but we can handle it. So, the younger we educate them about that and get their parents on board to set some boundaries, the better.* *Let's look at the Neuroscience briefly and then we will bridge the spiritual because my premise is, my belief is, you cannot separate the physiological from the spiritual. I know there are some people who are atheists, who believe there is no spirit in there whatsoever and I actually have conversations with those humanistic types who don't believe there's a spirit in there because most of what I do, the science is science. But there is a spiritual component to this. So, let's talk about the science.* *The area in question is an area deep in the middle of the brain called the nucleus accumbens and, in layman's terms, that is the pleasure centre. So, any time we do anything that causes us pleasure, that is the area of the brain that is receiving these little drips of a neurotransmitter called dopamine.* *Now the issue … with cocaine … is because when you look at the brain scans of people who are addicted to the stimulant known as cocaine and the stimulant as a screen or screen activity, those brain scans show that the addiction is the same in both. And the reason is addiction is addiction.* *So, the delivery mechanism for cocaine is through the veins primarily and it goes into the bloodstream, stimulates the brain,*	

				releases this chemical called dopamine and dopamine gives you pleasure, so you want more and more of it and that is the hook in the addiction. *… So when you are looking at screens – particularly things that are very interactive, such as pornography, such as video games, such as social media – you are generating dopamine. So, if you don't control it, eventually what you're going to do is get the hook in, you have addiction and that's why the heads stay down and we talk now about things like FOMO, fear of missing out and we talk Nomophobia – which is an anxiety disorder when you go without your phone or the battery goes flat.* *The area of the brain that starts to get affected, is the area called the pleasure centre or the nucleus accumbens and the brain starts to fight back when you get too much dopamine by building a barrier, a chemical barrier around it. … The more we do it, the taller that wall [chemical barrier] gets and it's the brain simply trying to defend itself by pushing the dopamine out. So what happens is, is a condition comes about called anhedonia and anhedonia simply means a numbing of the pleasure centre.* *So, emotionally, you get to the point where you don't care or feel, unless you are stimulated a lot. So that explains addiction. You've got to keep doing more, and more, and more, of the activity to generate large amounts of dopamine, so that eventually it spills over or penetrates that barrier and you get your fix. Okay, that's just science.* **SUBCODE 2.3.2.2b** **If you numb the *"pleasure centre"*** (Participant 17, page 7, line:10) **you are also, in effect, numbing the area of the brain where we take pleasure in our relationship with God** <u>Participant 17, page 7, line:1,10-22</u> *Here is the spiritual part, … the nucleus accumbens, or the pleasure centre, is also*	

		SUB-SUBCATEGORY 2.3.3 **In the classroom** I am sure you are aware of technology being used in education as well.	**CODE 2.3.3.1** **Pros of using technology in the classroom** Technology **can be a great tool** for both lecturers and students. It can **assist** lecturers (but not replace them) if they have a good teaching practice behind it, and to students if they use it with careful consideration. Two examples of how technology is currently incorporated into the classroom are given next.	*the same area of the brain that God has created for us to enjoy and take pleasure in a relationship in Him. So, it stands to reason that, if you numb the pleasure centre, not only are you physiologically numbing yourself, just on a scientific basis that anyone would agree with, an atheist or anyone who is not spiritual, but that is also the area of the brain that makes sense that when you're having devotions, when you are having your intimacy with God, when you are reading your Bible, when you are trying to communicate with the Lord and feel His presence … you're also numbing yourself to Him, because that's the area where we derive pleasure, period. … So, spiritually, I see an apathy that has crept into many spiritual people …* **SUBCODE 2.3.3.1a** **"I … think that technology can … improve and assist with the teaching process"** (Participant 16, page 19, line:10-11) Participant 16, page 19, line:10-13,21-23 *I … think that technology can … improve and assist with the teaching process. For example, technology can help us to pre-empt when a student is experiencing difficulties or to analyse the respective strengths of a student, to help better tailor course material to their individual needs … And I think machines can be a great coach in terms of helping people to improve in a given small area by a certain percentage, but I think that machines cannot really replace the mentorship role of teachers and lecturers.* Participant 7, page 16, line:10-12 *… [W]hen I teach people about the use of technology, I tell the teachers that you have to have good theory, practice, behind the technology, then the technology is a wonderful extension.*	

			CODE 2.3.3.2 **Cons of using technology in the classroom** Technology is not the solution to our educational problems, and it should certainly not be the focus of education. The focus should be on the highest-quality learning. In fact, it can be very dangerous to use technology in the classroom if you do not know how to use it as this can actually prevent students from learning. Technology cannot solve real-life, personalised problems – the actual type of problems that students need to solve in its "uncompromising supercomplexity" (Participant 15, page 21, line:21)	**SUBCODE 2.3.3.1b** **Technology can aid the learning process** Participant 7, page 17, line:24-25 *So, [I am] trying … to teach kids to be very deliberate and very thoughtful in the way that they're using technology and then it's a phenomenal tool.* **SUBCODE 2.3.3.2a** ***"You've given them a tool that they don't know how to use"*** (Participant 10, page 22, line:10) Participant 10, page 21,line:7-10,16-17,23-24; page 22, line:8-10 *I'll maybe just repeat … that thing that you picked up from my TED Talk, which is, I think, at the moment, technology can be seen as a little bit of a shiny light, you know, a little bright toy to play with, and I think that we're in danger of letting the technology use us. So, I think sometimes no technology is the best technology – to get students to sit around in a circle and to have a conversation. You don't need a PowerPoint presentation. You don't need to do that. And so, I think there's a danger in thinking technology is the solution rather than thinking that technology is just a tool. And that has happened – it's crazy, you know – they just dump a thousand iPads at a school and say, "Right, job's done now", you know, "we've given them technology." Whereas, no, you haven't. You've given them a tool that they don't know how to use.* **SUBCODE 2.3.3.2b** ***"[I]t's not really about technology, it's about the highest quality of learning"*** (Participant 2, page 5, line:23-24) Participant 2, page 5, line:19-24; page 26, line:15-16,22-24	

				[T]the people who are on the technology side providing these things, they train teachers in terms of which apps to use, and they train them in terms of how do you get it to connect to the Wi-Fi and what do you do, but still, educationally, they don't have, in my opinion, the curriculum framework to actually properly utilise the technology, because it's not really about technology, it's about the highest quality of learning. *… You can jump on the technology bandwagon and you can use tablets for the sake of tablets but if they, if that learning, or if those tablets or, or laptops does not fit into a global, holistic view of what is the highest quality of learning, it'll, to a certain extent, be a gimmick rather than a valuable tool.* **SUBCODE 2.3.3.2c** ***"[T]o what extent in a mobile age, in a technological age, in an Internet age, is deep learning facilitated or tacitly discouraged?"*** (Participant 12, page 9, line:19-20) <u>Participant 12, page 9, line:20-21,15-20</u> *… I have these concerns and I think, as I say, there are plusses and there are possible downsides of the new technologies, and for all the work that's going on in multi-modality and in research into Second Life, virtual life, and all of that kind of thing, and there's a lot of work around that. I don't know that the kinds of concerns that I'm pointing to are being researched as much as I would like.* *For example, what is the attention span of students? Question One. Two: To what degree and in what ways [do] the students read these days - is it just scanning material on the screen? Do students read really deeply? There have been issues now in the literature that you will know of, for the last forty years, about deep students, 'deep learning' as it's called in the literature, well, to what extent in a mobile age, in a technological age, in an Internet age, is deep learning facilitated or tacitly discouraged?*	

				SUBCODE 2.3.3.2d **It takes hard labour to get a student to a level of understanding – an app cannot do that** <u>Participant 15, page 18, line:13 – page 23, line:26</u> *… [T]echnology has given us so much that it would be foolish of us not to utilise technology … [B]ecause we have technology, we have developed at an incredible pace … The discoveries … that were made and everything … that revolves around that. However, and this is the crucial thing, the moment we are looking at education and technology things, … we need to be very wary of what we are talking about. I'm also going to make a very long story short in the sense that I want to go to the … whole development of, and it's very interesting, the whole development of learning design.* *… What I gather from that literature is the fact that, essentially, what has happened is that learning design has given people, a lecturer like me, has given me just another amount of apps that I can use in my lecture for my students or the practical for my students which I can apply, because, number one, someone else, therefore, has developed, has designed something like how does a problem-based situation work computer-wise, you know, what are those things? All the information is there, so I can go and study quickly, "Okay, I want a problem-based, so what is problem-based?" I need to get everything from … the app … I have these apps, like many of the apps that we find … everywhere today. So … I don't have to really think any more, because I just say, "Where's the app?" And I get the app, and the app is already designed for me. I do not need to put in that kind of labour and that kind of thinking and that kind of critical thinking if the app was not there. I'm not saying, no, forget about the apps, we shouldn't have apps. That's not what I'm saying. The apps … are good for if you want to achieve something, but now we*	

				need to go back to the point of education. So, if this is what education is, then we say to students, "Right, there are the apps", you know? Or I say as a lecturer, "Here are the apps. I'm going to do this." I don't need to sit down and design anything … and this is the critical point … it's not about the way in which the learning takes place, in the sense that I can now just have apps. Because … it is all about in terms of … what the student will be learning. *What I'm saying now is new. It's something that just really crossed my mind. So, because, when I, as a lecturer, then choose all these things, I will go into the classroom and I will have my students go through these processes. So, for me there's no real labour in designing, in creating something. For the students, they follow just what the app says that they need to do. So, the question, the critical question is not "How do they go about this learning?" but "What is it that they eventually learn?"* *So now you go back to the very important basic thing of … where's the authentic learning? Because we need to understand, I think, Nadine, that when, therefore, is learning authentic? … Learning is authentic when learners are confronted with a personalised, real, demanding, real-life challenge as it is constituted, in other words as it is found, in life in its uncompromising supercomplexity.* *This is, to me, very crucial – that fact – because that is what real-life is confronting us with; life does not provide us with an app to solve this or to solve that. … If it was the case, we would have solved all the problems already … therefore to simply then think "I can just use this app to solve that problem." And it's, and I go back to the very important thing [that Oscar Wilde said] "the world is in a grain of sand"… that, therefore, the student is confronted with this uncompromising supercomplexity … And because life is like that, the first thing that the student needs to do is to go into that complexity and find, the student needs to go and find that grain of sand. In other words, which makes this problem the problem. And there is, as far as I know … there's not an app*	

				that can do this. This is hard labour of the student that needs to delve into real-life and take all the peripheral things away and because of going through that process the student can see all the connections and the interconnections and eventually see, "Oh, there's the grain of sand!" But to have gotten there, the student … had been in contact with, and had been confronted with, and had to deal with, and have to engage with all the interconnectedness and all the relationships to eventually get there. So, there's the understanding. *And I don't think there's an app for that.* **SUBCODE 2.3.3.2e** **Google is not a learning tool** <u>Participant 14, page 16, line:31; page 2, line:1-8,14-15</u> *… Google can only tell you what we know. That means it is no tool for the future. It is no tool for learning. It is a tool for knowing what you should not learn. I mean you may know I am the Chairman of a company where we are processing agricultural waste and weeds into chemicals. When we decided that there is a huge resource available of thistles, which is a weed, people called me crazy. Today we have over 360 000 top industries processing thistles weeds. Now if you Google 'can you use weed for chemistry' then Google will not know what to do with you. So, even when it already exists, Google is not able to answer and so this is one of the problems … that we are perpetuating the out-of-date knowledge by relying on the Wikipedias and the Googles. It is not a learning tool. It is a tool to know what you should not learn. Anyway, when it is on the Internet why should you learn it?*	

CATEGORY 2 **TECHNOLOGY (Continue)**	**SUBCATEGORY 2.4** **EXAMPLES OF HOW TECHNOLOGY IS CURRENTLY BEING USED IN EDUCATION TO PROVIDE NEW MODELS OF LEARNING** Some participants also gave examples of current "new models of education" for the twenty-first century – such as the flipped classroom method and Makerspace – and how technology is used in these methods to, according to them, enhance the learning experience.		**CODE 2.4.1** **Minerva** Participant 16, page 5, line:19-22,28-29; page 6, line:2-3; page 28,line:12-14,20-23 *There's an organisation called Minerva and they have a model whereby all of the learning is done online, but the students bounce around every three to six months into a new city. So, there's a new physical location for them, which gives them a broader horizon in terms of understanding culture. Getting to know new people and then shuffling around. I think those kinds of models are a lot more useful for the kinds of skills which are necessary in the twenty-first century than traditional models of education.* *I think there are fantastic opportunities from technology and from AI to make education cheaper and to make it more accessible to different parts of the world. And I'm very excited by projects like the Roomie Project and things, which bring very cheap tablets to … young people all around the world and give them opportunities to learn by themselves. I think learning by oneself and then coming together with peers and one or two learned individuals to discuss what has been learned – I think that really is the core model of education in the twenty-first century.* **CODE 2.4.2** **The flipped classroom** Participant 16, page 4, line:29-30; page 5, line:2-5,11-13,19 *I think we are starting to find new models of education, which are quite interesting. For example, the flipped classroom method. Basically, where students, more or less, learn on their own, in their own time, and then coming [come] together ever so often with peers and also with tutors and lecturers sometimes as well, in order to exchange information and engage in peer learning and, you know, to support each other in learning. I think that kind of model is*		

			probably a lot more productive. Especially now in an age where essentially one can view a lesson anywhere at any time. So, the idea of having to be in a given lecture hall 9.00 a.m. on a Monday isn't really necessary any more. It also leads to some interesting new models of learning. <u>Participant 10, page 12, line:7-27; page 13, line:2</u> *... [F]or me, what the flipped classroom means is very simply this: That for the type of education experience that we, that you've described, that we've had, says that it's the task of the professor, of the lecturer, of the teacher, to impart the information to you. Then it's up to you as the student in either tutorial groups or as homework, if we can call it that – I know that's not normally a term we use at university, but, you know this concept of working on your own or working in a small group or doing homework – that is where you work out whether you've assimilated the data into your understanding, into your framework of knowledge. And then the exam is where you test whether you've done that. Now, I think that ... the flipped classroom says, "No! All of the data is actually already available online somewhere, so it's your task as the student to go and get the data before you come to the class." So, go onto a MOOC site, go onto Udemy or Coursera or Khan Academy, watch the video of the content we're going to learn. So, let's say, you're doing a history course and you're going to learn about the Blitz of London in the Second World War, go online and watch this video, read this article, read that book and then, when you come to lecture, the task of the lecturer, who is the professional academic, is to help you assimilate. Now, actually, at one level, that's what Oxford University has been doing for centuries. Oxford has the, what they call the "tutorial concept", where, for many of their courses, you don't actually have lectures. You have readings, you do the readings, you then arrive and the lectures are actually small tutorial groups, where you talk about what you've read, you integrate, and then your lecturer gives you an assignment. And, you know, Oxford has been recognised over the years as, you know, one of the greatest educational institutions in the world.*		

			And maybe, maybe they have a point, you know, in the way that they've approached it. And now technology can help you to do that even better. **CODE 2.4.3** **Makerspace** <u>Participant 2, page 7, line:14-16; 29-31; page 8, line:1-29; page 10, line:19-31; page 11, line:1-26</u> *… [W]hen I went to Hong Kong, they also took us on tours through the schools and, and so forth, and I didn't really see anything new, except for a concept that they call a "Makerspace". Makerspace is a … global movement and it's all about putting technology back in the hands of people. So … there was a time where, when your car broke, you [could] physically fix it you know, … but, due to various reasons, cars are being manufactured these days that you cannot get access to those components. You need to take it to a dealer or you need to take it to people with the computer. And it's the same with small things – the DVD player, … if your DVD player breaks – even something simple, if your iron breaks – and they're designed to break eventually, you know, they're designed to fail. You've got to buy a new one. So, the Makerspace movement wants people to be able to fix their own DVD players if the DVD player breaks.* *… They actually want people, without necessarily the proper resources, to start creating new technologies that'll improve the world. … So, the Makerspace movement is all about equipping learners with the knowledge and the tools so that they can be creative thinkers and they can start being active participants in the technology movement of the world. But what is now interesting, this movement at schools is currently not taking place in the classroom, because there's no room in our curriculums to have something that's process-driven and not end-product driven. Because this Makerspace movement is all about, "Okay, what do you want to make?" and "What dream do you have?", "Okay, now you go for it". And whether or not they fail is beside the point, what that thing looks*		

			like is beside the point, that process of the learner struggling with this, it's not working, … and the only form of assessment they've got in this movement is in six months we're going to have a show and tell and you just show them "This is my stuff". There's no marking, there's no rubric, "You've got to adhere to this criteria", or whatever. And because of the fact that our education is so far removed from, from real-life learning, people are doing this during breaks and after school because they don't see the space inside the curriculum to do this, but this is actually fantastic learning. *… It's real-life because he sees a real-life problem that needs to be solved. You know, so it's fantastic high-quality learning, but they're doing it in breaks and after school because the moment you put it in the curriculum, it needs to be assessed, it needs to adhere to certain criteria, you're constrained by time and so forth, and so forth, and so forth.* I now knew how the participants felt regarding the current education system and the message it portrays. The role of the neuroscience of the brain, technology (particularly AI, how it affects communication as well as the brain – in terms of both memory and addiction – and the role it plays in the classroom) also surfaced as important, undeniable, features.		
CATEGORY 3 **LEARNING** Seeing that the interviews show that the focus of education should be on the highest quality learning, let us have a look at what learning, the core attribute to being a student, is. From the interviews, we can see that learning is not memorising information but rather constructing	**SUBCATEGORY 3.1** **WHAT IS LEARNING?**		**CODE 3.1.1** **Ultimately, learning is struggling to get to an understanding of what you discover(ed) from a new, unknown experience** <u>Participant 15, page 24, line 3-7</u> *[Learning is] "I need to struggle through all this confusion, everything, to eventually get to the absolute nucleus of it. And when I get that, then I understand it." And, you know, … this is such a beautiful thing in terms of Piaget that says, "… If you prematurely teach a child something he can discover for himself, you're preventing the child from innovating it and understanding it."*		

meaning from emotional experiences.					
CATEGORY 3 **LEARNING (Continue)** The interviews show that we learn by going through an emotional experience that impacts us personally and making meaning of that by interconnecting it with the bigger picture.	**SUBCATEGORY 3.2** **HOW DO WE LEARN?**		**CODE 3.2.1** ***"So what we know, that the brain does, is it finds patterns and it makes meaning"*** (Participant 5, page 9, line:6-7) <u>Participant 5, page 9, line:6-7,16-26; page 20, line:4-11</u> *... [W]e learn by making meaning. So what we know, that the brain does, is it finds patterns and it makes meaning.* *... [C]onceptual change is that idea that we have already, a way of thinking about things, and when we hear new things, we interpret it through the meaning that we've already made; we interpret it through our existing models. So, sometimes, if it doesn't align, it just won't stick and so that's why we can memorise – "oh, that's the answer to the question" – but if we don't change the model in our minds, then it won't stick. Actually, you can think of it as a metaphor to education system in general. We have this model, even if you bring in something and you say, 'Oh, sitting in groups is helpful for students' and you do that, well, the underlying model is still passive learning, the underlying model is still information-focused and so that change isn't going to be useful, the change isn't going to stick. I don't know if that's too abstract, but it's a similar idea on the scale of the individual brain and on the scale of a classroom or education reform.* *Yeah, so that's a really hard question, because there're so many different things happening. Learning can come in different forms. A lot of times you can learn something but then forget it. So, I think a researcher would say that we're constantly learning. Like, I'm learning from this experience, we're learning from every single thing, at some level, at a micro level, we're learning from every single thing. So, if you think of babies – they're constantly learning. That's at the micro level ... So, learning – I would go back to the conceptual change idea. Learning looks*		

			like challenging our models and making our models more complex. It's a really hard question. **CODE 3.2.2** ***"So, to me, discovering a connection with an emotional experience is what makes you learn"*** (Participant 14, page 4, line:9) Participant 14, page 3, line:5-18,20-22; page 4, line:3-6,9-28 *… As we start learning to know about the brain, or, actually, we still have no clue how the brain works but we are starting to have some indications, when you want something to remain in the long-term memory, it is indispensable, it is connected to an emotional experience. You cannot learn by memorising … It goes in and it goes out. People pass the exam and, a month later, they don't remember. Why? Because it doesn't connect to anything that is emotionally interesting for them; it doesn't help them solve an urgent problem they have in their family or in their lives. So, to us, the most important is, in the first place, that we develop the emotional intelligence; that means every learning must find a connection towards an emotional experience, but not just any, it is just not that you like or dislike, it is something that touches you, and when something touches you, you will be predisposed to learn so much more and investigate and assimilate much more because it will become part of your long-term memory. But the second thing in order to be able to connect with the emotional learning, is that it must be able to connect to many different issues. … So one of the things education has to do, is to help the student for life, help the student to see connections that interconnect issues before them. … So, to me, what we are in need of is, on one hand, to see the emotional connection to the person who is learning and, in the second place, we need to see the multiple chains of connections that enfolds afterwards.* *So, to me, discovering a connection with an emotional experience is what makes you learn*		

			because … now we know, when you have that opportunity, actually, new synapses are created, new cells are connected, brain cells are connected, you create connections in your own brain neuro-network. When you go through, on one hand, the emotional, two [on the other hand] you are discovering things that even your professor never knew and that is the experience. Now this is linked to a third one that is critical, [it] is the capacity to do yourself, the capacity to experience yourself. Now, when a child wakes up in the morning, a child doesn't say, "Let's make a plan for the day". A child gets up and has dreamt about frogs and he goes out and looks for frogs, and when he finds a frog, he could spend the rest of the day with the frog. He has nothing planned, nothing scheduled, but the discovery is out and the child is going to see what the frog is all about; but when it is with the frog and it sees a lizard, or a gecko, or a newt, the child will immediately be diverted [diverting] its attention and it will start connecting. But the key thing is that the child moves from an emotional abstract experience, an imaginary experience, to a range of connections to something that is real. It can feel the frog, and the tactile connection and the visual connection is much more important than the brain connection or than the logical connection – it is all connected to the brain, of course. So, to me, that is my learning, it needs to go through such a transformation because we will never be able to imagine a better world if we are only working with the wisdom of the past, which is transferred with the same rigor, I would even say dogmas, as we are doing today.		
CATEGORY 3 **LEARNING (Continue)** The purpose of learning is to see the endless possibilities that life offers us and do something with what we have learned.	**SUBCATEGORY 3.3** **THE PURPOSE OF LEARNING**		**CODE 3.3.1** **Learning provides *"millions of opportunities"*** (Participant 14, page 11, line:7-8) <u>Participant 14, page 11, line:6-12</u> *Our brain is meant to be capable of making so many connections and so many options that we have millions of opportunities but because we have everyone forced to see only one or two or three, we are unable to see the opportunities in life. I mean, this is what it comes to. We don't see*	**SUBCODE 3.3.1.1** ***"[Y]ou have to be able to do something with that knowledge"*** (Participant 5, page 16, line:26) <u>Participant 5, page 16, line:25-26</u> *… [K]nowledge alone is not enough, information is not enough – you have to be able to do something with that knowledge.*	

			opportunities in life anymore. So, how can we have positive-minded people? How can we have people who are not ready to cut the corners and not ready to cheat in the system when the only thing we teach them is a little box and then within that box they have to survive?		
CATEGORY 4 **WHAT THE EDUCATION SYSTEM SHOULD LOOK LIKE**	**SUBCATEGORY 4.1** **WHAT THE MESSAGE SHOULD BE** The message that the university should give, according to the participants, speaks of much more complexity, seriousness and depth, than the current university message. Students themselves must be able to deal with unpredictability. This implies to engage with life in its uncompromising supercomplexity by being part of a community of important relationships to develop personally (acquiring the fundamental human virtues – potential – and practicing it) in order to thrive in risky circumstances.		**CODE 4.1.1** **Deal with life in its uncompromising supercomplexity, to which you don't know the answer, or even whether there is an answer, and what the solution might be. You can rely solely on yourself to solve this challenge, because you have potential.** Participant 15, page 26, line:5-30; page 27, line:1-12; page 30, line:8-22; page 31, line:2-5,17-18,24,30-31; page 32, line:1-22; page 36, line:9-10; page 103, line:6-11,17-24 *To put it very bluntly, the message that the student needs to get is that life out there, and when I say 'life out there', of course I'm not talking about a duality, you know – here and there. But what the student needs to understand is that life in itself is already holistic, it is super-complex, with interconnectedness of everything, therefore, also uncompromising – life doesn't say, "Okay, listen, I'll give you a little space here so that you can look through this thing." It doesn't do that.* *So, students, therefore, [need] to get the message that "I'm confronted with life with an incredible interconnectedness, with an incredible non-answering thing, which just actually bombards me with more questions." So that's the message. So, here's the student, so here's life, so what am I doing here? And then for the student to realise that the only way to find an answer is to engage with this thing that's called "life". I mean, engage! It's not standing alone. … [T]he fact of the matter is that the student's message would, should, always be that you will be confronted … with life and what to do next will be uncertain. That's the point. So, what to do next will be uncertain.* *Number one, and I think number one in terms of*	**SUBCODE 4.1.1.1** **Potential refers to the fundamental human virtues ["ethical competences of moral excellence"** (Participant 15, page37, line:1)**] consisting of intra- and interpersonal virtues** Participant 15, page 36, line:10-31; page 37, line:1-27; page 38, line:1-11 *I call it [potential] fundamental human virtues. It is … a set of virtues that is fundamental. … [T]hese virtues correlate with Aristotle's virtues. But … they also correlate to aspects of spirituality … if you look at the Christian spirituality in the sense of the fruit of the spirit. And I think those are very crucial aspects of virtues. But … what is critical about these fundamental human virtues, there are intrapersonal ones and there are interpersonal ones. So, the intrapersonal ones are those that define me as a person, as an individual and then the interpersonal ones define me as a person amongst other persons. But what is critical about these fundamental human virtues is the way in which I also define them and that is they are ethical competences of moral excellence. Now what is critical about that, of course they are ethical and, you know, to put it very, very simply, is that, in other words, it's the right thing to do.* *It's ethical. But it is a competence, it is a doing thing. It's doing something, not thinking something, it is doing something. Right? So, it's an ethical competence. It's always doing something. It's, therefore, always doing the right thing. Right? Because it's ethical and it's doing, it's a competence of moral excellence. … So, if I do the right thing, … then I will be moral, but that doesn't mean I'm excellent. So, therefore, the requirement is always*	

			that, Nadine, is that there is not a solution to this problem. Because if [there was], why would you engage in this? So, there is not a solution to this problem. And that's, to me, very crucial. *Therefore, what you need to do next is uncertain – you don't know …* *Not knowing, number one is not knowing what the answer is. Number two is not knowing even if there is an answer and number three is not knowing how to go about finding the answer or the resolution. I don't know that yet.* *I think that would pertain to something else further, but can you imagine, therefore, that this is life? And the student is confronted here with these things, can you then imagine that the fact of everything that the student possesses now is therefore insufficient?* *So, I cannot depend on anything that I have right now; I cannot depend on that. I have to find something else. And for that, therefore, I don't need knowledge because I don't have, I don't need skills because I don't have. … So, the question therefore is, what do I have? Not knowing the answer, not knowing how to get there, not knowing the skills, not knowing anything, is then the only thing that the student has, is him- or herself.* *That's the only thing that the student has to rely on.* *… [S]o, the knowledge we have is not going to solve it, the skills we have is not going to solve it. So, there's nothing out there that's going to help us to resolve these questions.* *It's only in here and that's the only place that "I", as a human being, have control over. I have no control over these things. But what I do have control over, is me and the incredible-ness of being human. ... [A]nd we can boil it down to the things like … potential. … We are so endowed with potential, it is incredible what we are capable of.* *Authentic learning is an immersion of yourself in a demanding real life experience that challenges to the extent that it ignites your curiosity and at the same time your courage to venture into the unknown. … [Y]ou engage with the challenge and as you go along, you are constantly in a reflective mode in making sure that you go*	*excellence. So, even when and if I am doing something right, the question is not, … did I do it right? But how well did I do it rightly …* *So, it's always a challenge … – and this is the point which you need to, somehow, grab – it is always, always, always, therefore, a question of quality. Nowhere and in no point in time are we excluded from quality life. And that's why Socrates' quote is so beautiful: "An unexamined life is not worth living."*	

			through the process with motivation and taking initiative to do the exploration with the required effort and persevere through the difficult aspects. And then even while you are exploring and …. even because of your exploration, you start to construct this real-life experience with great responsibility and independence. The result of this construction of yours brings you joy, and you care about or love the things from which you have learned so much you see … This gives you the motivation to look for another challenging real life experience that you want to explore, and you take the initiative to immerse yourself in that experience. And this is the cycle where you access and ignite your virtues … and also at the same time, attain and improve the level of excellence of some. You see, you live the virtues because that's the only way you can attain … or even improve them. **CODE 4.1.2** **Thrive despite uncertainty** <u>Participant 2, page 13, line:2-7</u> *Students need to be able to cope with uncertainty. So, the message should be "You're entering an uncertain world, with complex, real-life problems and you need to thrive despite of that uncertainty." So, not only do they need to be able to handle problems, … new and novel problems, ill-structured problems, they should not only be able to handle it, but … they need to thrive … in that environment, because they are all heading towards an uncertain future.* **CODE 4.1.3** **Engage to cooperate to be a better citizen** <u>Participant 4, page 9, line:23-31; page 10, line:1-8</u> *I think the message should be, "Learning is a collaborative and a cooperative process." And I think the message should be, "Come here to be part of the learning process yourself; come here to be engaged in the university, in the*		

			surrounding community; come here to, not just to sit in a classroom and be talked at, come here to be part of the learning process and, sort of, as a cooperative of faculty and staff and students and community members who, together, are focused on developing the student in multivariate ways so that that student then becomes a better citizen, a better contributor to the community, to society, etc." So, I think that's what I would love, eventually, the message to be, based on the student experience. *Now, if you sit students in, you know, the traditional environment that you described at the beginning, Nadine, that's the problem – it doesn't really speak to a cooperative or a collaborative nature; it doesn't speak to a dialogue, it speaks to an injection, where the faculty injects knowledge into the students and the students receive it and regurgitate it. That's the current message. I think I'd prefer it be the message that I just described and that is more collaboration, where students actually describe relationships with faculty members, where they see themselves in a relationship, in a dialogue, about learning, rather than seeing the faculty members as sort of expert on high, who gives them the information they need and they go along their way as robots and spit it out.* **CODE 4.1.4** **Develop what you need to develop** <u>Participant 5, page 13, line:8-15,23-24; page 14, line:11-14</u> *I think that the messaging ideally is, "We, the school, the teachers, this community are here to support the students and guide when necessary in developing everything that they want to and need to develop." So that's really broad, but that's because it's kind of going the other way from, "You have to learn this and this", it's, "How can we support you in developing what you want to and need to develop?" How to help students to understand them, but not to take out the active part of figuring them out, if that makes sense.* *… [T]hen the other part of the messaging is (and this is easy to say and really hard to achieve)*		

			[the] community that is aligned and there to learn and support each other and that ties into the social, emotional learning relationships; everyone is talking about how it matters so much. **CODE 4.1.5** ***"Learning and synthesising multiple perspectives into perhaps a new way of thinking"*** (Participant 7, page 11, line:15-16) <u>Participant 7, page 11, line:15-20</u> *I think the message to all our students has to be that [education's] purpose … is learning and synthesising multiple perspectives into perhaps a new way of thinking, but at the very heart of it has to be conceptual-based thinking. So, I have to be challenged as an important contributor in a dialogue as we, together, move our world forward, whether that means I go into the sciences, whether I go into humanities or the arts, mathematics, whatever* *I go into, I think the message has to be, "Think, prepare, contribute, listen in a dialogue" …*		
CATEGORY 4 **WHAT THE EDUCATION SYSTEM SHOULD LOOK LIKE (Continue)** The participants also elaborated on the university's purpose and, therefore, also its responsibility. Students should be able to become themselves by discovering the truth about themselves (what their potential is) by taking critical action – in a continuous learning environment with a continuous learning desire in an interdisciplinary approach – therefore	**SUBCATEGORY 4.2** **THE PURPOSE OF THE UNIVERSITY**		**CODE 4.2.1** **The education system should be challenging students to *"become themselves"*** (Participant 12, page 12, line:21) **(find the truth about themselves) and therefore education *"cannot be limited to the intellect"*** (Participant 13, page 2, line:27-28) **but *"must include emotions, relationships, and every other salient dimension of what 'being human' means"*** (Participant 13, page 2, line:28-29)**: to become *"fully human"*** (Participant 13, page 2, line:25)**, to develop *"dispositions"* and *"personal qualities"*** (Participant 12, page 12, line:22-23) <u>Participant 12, page 11, line:7-9; page 12, line: 20-31; page 13, line:1-11</u> *[W]e have a responsibility, in higher education, to help students prepare for life in a world in which we cannot even envisage … that curricula and pedagogies should be open, should be challenging, but open, such that students are*	**SUBCODE 4.2.1.1** **Truth is discovering your potential** <u>Participant 8, page 5, line:8-18</u> *And again, the Upanishad gives us very useful guidance on that. It says: "Within be fed, without be rich no more. So shalt thou feed on death that feeds on men and death wants dead, there's no more dying then." … [T]hat's a quotation from Shakespeare. But the Upanishad says … the quotation I was going to use from the Upanishad says: "The good is one, the pleasant another." The "good" is associated with the Inner in man, the "pleasant" is associated with sensory objects and the Creation itself. You cannot manage that, it's impossible to manage that. The only way to manage that is to first discover the truth about yourself, to discover your own, you know, your own potentialities. And so, according to the great sages – I'm talking*	

attaining the fundamental human virtues through "transformation of their being to the highest order"			*given spaces to come out of themselves, to become themselves, to develop the dispositions of endurance, of openness, of an inquiring mind, but also to develop personal qualities. So, they will become themselves, so that John and Mary on this one course are not going to be the same at the end of the day. So, all this talk about learning outcomes, as if there should be common learning outcomes for students within a programme, is quite wrong. We ought to allow spaces for John and Mary to become different, to develop their own qualities, so that they develop in their own ways within a relatively common horizon of expectations. And this means, as I say, giving students spaces to engage in things in their own ways, to come at difficult situations, to give them the courage and to launch out into their own ideas and feelings and emotions and develop those and feel their way forward. It's very important if you're going to be a doctor, if you're going to be a professional person of any kind, going into the world, you have to develop your own personal resources to cope with whatever the world's going to throw at you.* *So, we need curricula that give students openness, gives them powers of responsibility for their own learning, but also, of course, sets very demanding and challenging standards. It means putting the student into curricula as a real component alongside the kind of knowledge and knowing that they … we want them to take on and the skills we want to them to acquire. This is quite a demanding, as it were, educational challenge, but I haven't finished with my challenges, because it is a very small world that we're now in. It's a global world in, literally, in that every part of the world now is influenced by every other part of the world. And we need students to be able to understand themselves against, not only a national perspective, as I know you're trying to do in South Africa, in extraordinary brave and challenging ways, but we also need students to understand themselves in a global context and in a global perspective.* <u>Participant 13, page 2, line:24-29</u> *Ultimately, the purpose of any education worthy of the name, is to help human beings become*	*about Socrates, Emerson, Shakespeare, Marsilio Ficino and many, many others, you know, Jesus and all of the great sages – the way to go is to go within.* *And so, it's important to encourage students to first discover the truth about themselves. Having discovered the truth about themselves, then they would be better able to manage and to cope with situations outside of themselves.*	

			more fully human. This certainly means new understandings of knowing, teaching and learning that take ethical outcomes into account. But if we are going to help human beings become more human, education cannot be limited to the intellect. It must include emotions, relationships, and every other salient dimension of what "being human" means. <u>Participant 7, page 13, line:27-31; page 14, line:1,7-8,14-21,27-29; page 15, line:5-17</u> *I feel like we have to be developing qualities in students, and the quality of an individual who matriculates through our educational system, the qualities we want to develop, are curiosity. We want to keep stimulating what we're born with. We want to take that curiosity and give students venues for creativity and innovation. You know, we're pretty good at asking questions that keep kids, kind of, spikes their curiosity and then we hand them a worksheet and say, 'Sit there and I'll tell you what you need to think about this.' That's not how curiosity works. If I'm curious about something I have to follow it and I have to pursue the knowledge just like you're doing with a dissertation.* *We do expect dissertation candidates to be able to think in a twenty-first century, twenty-second century framework. That's why so many people don't complete their dissertations, because a whole system hasn't programmed that direction. So, you have to call me and other people … and you have to ask us questions, because you have to go get the information, … and you're pulling together, which would be the next piece of my idea on what a learner has to look like.* *We have to be curious, … and embrace our creativity, which leads to product, which is innovation, that appeals to multiple people as a possible solution.* *To do that … we have to use our own initiative. And if I'm waiting for the professor to tell me what to think, I'm not using my initiative, I'm not stimulating my creativity; I might have been curious initially, I'm not even curious anymore, it becomes a survival mechanism.* *So, it's a totally different model. It's creativity, curiosity, multi-disciplinary thinking, initiative*		

			and then I believe in this world in which we live we will doom ourselves if we don't help students develop the quality of empathy. So, … how do I think through the paradigm of what's good for the world, what's good for my colleagues, what's good for my fellow human beings? How do I listen to their ideas to really challenge my own? And that's where my model for curriculum is problem-solution. The problem I see, is so many leaders don't get that. So, they keep leading in an old model and then a teacher that's innovative and does things a little differently, is threatening and generally isolated and put down. So, I see a whole movement of people who are really brilliant educators, at the university level and K-12, and they're gravitating towards other solutions, toward one another. Rather, they're being disenfranchised by people who don't understand how to listen to one another empathetically. So, I feel like empathy is a big piece of the quality that we have to develop in our twenty-second century, twenty-first century learners. <u>Participant 8, page 3, line:8-31; page 4, line:1-14, 20-31; page 5, line:1-8</u> *… That's a very important question, … and we have some really excellent references from books like these, the Upanishad, which is a very ancient, un-authored script, which in philosophy is called Shruti, which means the truth which is contained in sound. In other words, it's intuited by great sages and it doesn't need to be written down, but anybody who's pursuing a path of wisdom would be able to intuit this truth.* *So, nobody knows who authored the Upanishads, but they give us some very good pointers on this and an example of this is where a young student, who's called Narada, he approaches his teacher, his name is Sanat Kumara, these names may sound a little strange, but this obviously goes back some time.* *And he approaches his teacher and he says to him: "Look, I've finished studying and I'm really unhappy; I'm not happy at all. And people have told me that, you know, the reason that I'm not happy is because I don't know and understand this … this thing that I've heard about called 'the*		

			self'." So the teacher says to him: "Well, let me start off by asking you what you know." So Narada says to the ... to his teacher, he says: "I know history, I know biology, mathematics, physiology, astronomy, astrology ..." and he rattles off about fifteen subjects. *He's a brilliant young man, who later became one of the great sages in the East himself. Now he's approaching his teacher as a student and he's telling him that he's finished his education and he knows all these subjects.* *And the teacher looks at him quietly and says: "The reason that you're in sorrow is because all that you know is names and information and there's no merit in that." He said: "What you need to do is you need to know these subjects in a universal sort of way. In other words, the only way that you can explore the limits of any particular subject and move within the limits within that subject, is to know the subject in relation to the Self."* *And then he goes on to explain to him what the Self is – it's this divinity within each one of us, which we need to access and to realise, ultimately, to realise. And then he goes through about fifteen different subjects and he explains to him very carefully, in detail, how, if he knows that subject in relation to the Self, then he can move completely within the limits of that subject, freely within the limits of that subject, and understand it wholly and fully.* *So, this is a fundamental tenet of philosophy – that everything begins with One. In the paradigm of ... that we study, or in the paradigm of philosophy, and certainly all the great sages, that One would be the Self or God or the Creator.* *And this doesn't in any way discount evolution, that's a different subject and that's something that one can explore at a later stage (it's just that the idea of evolution is turned completely upside down). But, what is important is this – that if everything comes from One, then in the philosophical context, every subject also arises from one subject.* *And the teacher proceeds to tell him that that one subject is the Truth. So, you have one subject, which is the Truth, and every other subject, no matter what it is, proceeds from that subject. So,*		

			the only way that one can understand that subject, whatever it is – physics or physiology or astronomy – the only way that you can ever completely understand that subject and move within the limits of that subject, is to understand that subject from the basis of the Truth, you know. In other words, in a completely universal context. *… Truth is really indefinable, but the way that we attempt to define it is 'that which never changes'. So, Truth is something which never changes. It's not dependent upon a particular context, or upon a particular age. It's completely independent of gender or anything like that. It never changes and it's the same for everybody. And, of course, it's a very big subject, so it's very difficult for me to, in a very short space of time, tell you what Truth is.* *But, from a philosophical point of view, the starting point is that the human being is … occupies a very special place in the Creation, because the human form is the highest form in Creation and is given governance of the Creation. So, the governance of the Creation depends upon the behaviour of the human being. And this implies that we have a great responsibility for how the Creation unfolds. So, the way that the Creation unfolds is directly dependent on the behaviour of the human beings in the Creation.* *That responsibility is conferred on human beings by the Creator and the Creator doesn't interfere after that. So, this is … this brings us to another really important point in relation to students and their responsibilities and how they should go … proceed about their work. And the point is this: that we are taught from a very young age that we need to explore and discover the outside world and to try and manage the outside world and the situations that are presented to us in the outside world.* *But it's actually impossible to do that, because there's so much happening in the outside world and it's all dependent upon things that have happened in the past, related to human behaviour, that it's impossible to manage the outside world purely from a contextual point of view. So, the way that we would start in*		

			philosophy, is we would encourage our students to begin inside. **CODE 4.2.2** ***"Education is [should be] all about the transformation of the human being to the highest order"*** (Participant 15, page 101, line:7) **by challenging students with *"real-world experiences"*** (Participant 7, page 30, line:9) <u>Participant 15, page 101, line:6-13,19-20</u> *... [F]or all practical purposes we really need to understand that education is [should be] all about the transformation of the human being to the highest order and not anything with regards to knowledge and skills. It doesn't mean that knowledge and skills doesn't need to be there, but if our focus, if our total focus, is not the transformation of the human being, in other words the attainment of the intra- and interpersonal human virtues ... So I take students out there not for them to have the knowledge or to solve the problem, that's only a way through which they need to attain these things [the human virtues]. And if that way is not good enough, it's not tough enough – then it's bad, then I need to get a tougher thing that they need to go through so that these things can be valid. I need to make it more difficult, I need to make it more unknowable.* <u>Participant 7, page 30, line:5-11,17,23-26</u> *... [A]uthenticity has two definitions in the realm of education, which is my field. Authenticity means real-world experiences and authenticity also means engaging with your humanness. So, there are really multiple definitions in our world of education when we talk about giving students an authentic learning experience, but often meaning a real-world learning experience. But my curriculum model has taken that a step deeper: Authenticity is also being the human and the best human you can be, as a contributor, as a thinker. And getting in touch with who you are and your own life.* *So, we desperately need models for both realms*	**SUBCODE 4.2.2.1** **Education should challenge students to become critical actors rather than merely staying critical thinkers** <u>Participant 12, page 14, line:13-17; 29-31, page 15, line:1-17</u> *... [Ju]st as I've been saying that knowledge and skills are inadequate and need to be buttressed by a sense of students as unfolding human beings, so the very idea of critical thinking and critical thought is, in itself, inadequate and needs to be buttressed by a sense, on the one hand, of, as it were, critical thought being put into action by students in situations, but it also means, more profoundly still, a sense of students developing as critical persons.* *... So, critical thinking is not enough anymore, to be simply a critical thinker, as it were, in academic settings; even engaging in critical thinking in academic discourse, in academic papers, in academic debate – that's no longer enough. We want our students to be critical persons. And so, the question is, 'How do we bring that about? And what is it to bring that about?' There is a whole school of thinking around what's termed, particularly in the United States, around 'critical pedagogy'. My position is somewhat different from that of the critical pedagogues, because they start off (not unreasonably) with a sense that the world is awry, the world is unduly imbued and is saturated by ideological forces and interests and power structures.* *I agree with that, but they then take the next step to this effect, that it is the job of universities to enable and virtually to expect that students will themselves be critical and even, almost revolutionary, agents taking on the world. My view is, my sense is, that that just topples over the edge a little too much, with question-begging perceptions of the*	

			of authenticity. Authenticity means thinking like a scientist, not learning about science and authenticity means being who you are and striving to your next level of learning, without judgement, without sensor. And we have to educate. So, hopefully that's where your study is taking you.	*world, which themselves need to be on the table for critical analysis. And I have difficulties, wondering about what the critical pedagogy is going to look like across all the disciplines. What does it look like for students doing physics and chemistry, and so forth. It seems to have cash value, mainly in the humanities and social sciences, whereas my idea of criticality cashes out across the whole of the university, in all the disciplines, and has, as I say, at its heart a sense that we should be encouraging critical dispositions to form in students and we can do that in all the disciplines. But it needs to be done carefully and not for us to, as it were, impose our own, somewhat question-begging, political stances into the curriculum.* **SUBCODE 4.2.2.2** ***"The entire education endeavour should really be about how do we create … a continuous learning environment and a continuous learning desire"*** (Participant 9, page 14, line:27-28) **that allows the student to *"engage in it [the subject] with wholehearted involvement"*** (Participant 6, page 1, line:27) **and to stay a lifelong learner** <u>Participant 9, page 14, line:26-31; page 15, line:1-2</u> *The entire education endeavour should really be about how do we create … a continuous learning environment and a continuous learning desire. Because your ability to succeed in the world of the rest of the twenty-first century will likely depend on your ability to acquire new knowledge on a continuous basis and then apply that new knowledge, you know, in an intelligent way or, if you wanted to think competitively in business terms, you can think apply that new knowledge before somebody else does. But the whole task of our time now is nothing stays static and so you have to continuously learn.* <u>Participant 6, page 1, line:24-32</u> *[The] emphasis of [university should be] on*	

				the intrinsic goods [good] of studying a subject, rather than the extrinsic one just mentioned [in your first question]. I'm thinking that an aim of university study, as of school learning, is that students should come to love what they are studying, to engage in it with wholehearted involvement. This way they are far more likely to master it than if half-heartedly pursuing it and then only to get a good grade. One reason why universities should try to bring about this love of a subject is that this is likely to help the student to lead a fulfilling, or flourishing, life, given that this has a lot to do with successful engagement in intrinsically worthwhile activities and relationships. <u>Participant 16, page 8, line:25-26,32; page 9, line:5-8; page 8, line:2-5,11-13</u> *I ... think that having an interdisciplinary approach, is incredibly valuable in the twenty-first century. For a long time, the general principle has been towards specialisation, right? We are further and further specialised niches of study.* *And that has, you know, there are some benefits to that, in terms of being able to concentrate, skills in modern time for an area, but, again, with the rate of technological change, that space can very [easily] become either irrelevant, or all the knowledge that one has gained in that area can be superseded, you know? The idea of receiving some knowledge in your twenties and then using it for the next thirty or forty years, is very much [a] misnomer.* *So, rather we need to be teaching an interest in the subject, first of all, so that people remain engaged with it. And the processes of lifelong learning. And giving them also a network within which to learn through, you know, a long life; to be able to continue sharing information, sharing the latest research and, yeah, understanding what it means, both today and tomorrow.*	

CATEGORY 4	SUBCATEGORY 4.3		CODE 4.3.1	SUBCODE 4.3.1.1	
WHAT THE EDUCATION SYSTEM SHOULD LOOK LIKE (Continue) The next subcategory investigates what should, in fact, change in the education system as well as how it could be achieved. Within Category 4, the interviews reveal that the university system should therefore focus on the process of learning, rather than the product, as opposed to the current system. This should be done through the attainment of the fundamental human virtues, thus, the development of potential – by solving a real-life challenge in its uncompromising supercomplexity – where the student discovers the truth about him/herself. The physical learning environment (the architecture) and the assessments should assist with this development, which is, ultimately, personal development by transformation to the highest order of being human.	**WHAT SHOULD CHANGE?**		**Everything should change** When asked what should change in the picture I described to the participants in the first question, some participants replied very adamantly that "everything needs to change". (Participant 15, page 71, line:16) Participant 15, page 71, line:15-16 *Everything! Everything needs to change … [I]t has to be a paradigm shift – everything needs to change.* Participant 13, page 2, line 19-20 *… I can't possibly give a brief answer to the question of what needs to change – except to say, "Almost everything!*	**Achieving change through your fundamental human virtues** Participant 15, page 71, line:22-27; page 72, line:2-3,9,15-16,22-23,29-30; page 73, line:5,11, 18-19 *So, now the next question is, how are we going to achieve that, right? And all I can say with regards to that, is through your intrapersonal human virtues and through your interpersonal human virtues. In other words, now we have the institutions like we have, with these wonderful lecture halls, et cetera. Do we have the courage to say goodbye to that wonderful technological thing and take the students somewhere under a tree or whatever the case may be? Or are we going to keep the students confined into a lecture hall?* *So here it is. Do we have the creativity which we now, how could we, therefore, exploit what we have there? But not in terms what we have there. Do you understand what I'm saying there? Right. So, we need to, because we have it, we need to exploit it.* *But not use it in terms of what is there. Now, you asked me what's the answer to that … I don't know. But if we don't do that, if we have these things dictate to us, we will fall back into this conception. This question-one conception. Because it's all about our being human. … It's not about our knowledge, it's how are we, how, … and remember … "how are we" means "be".*	

			CODE 4.3.2 **Changing assessments** Several participants suggested that current university assessments are a major problem. They believe that the traditional method of assessing a student should change – because it does not show that students are capable of learning – so that the student could be assessed by an "achievement system" (Participant 6, page 2, line:3-4) or by evaluating his/her "hidden efficiencies" (Participant 2, page 18, line:17) rather than being tested on what they can reproduce from memory.	**SUBCODE 4.3.2.1** **A degree does not certify that you are capable of learning** <u>Participant 10, page 11, line:18-22</u> *… [S]o an assessment leads to a certification and the diploma, the degree, … certifies that you are a particular type of person. At the moment, the certification simply says, "You can remember 50% of everything that was dumped on to you." It doesn't certify that you'll keep up, it doesn't certify that you are capable of learning in your profession and I think that's a huge, huge problem.* **SUBCODE 4.3.2.2** **Moving toward a *"record of achievement system"*** (Participant 6, page 2, line:3-4) <u>Participant 6, page 2, line:1-26</u> *One way of improving on the picture you present is to reconsider how university study should be assessed. There is a case for moving away from the present high-stakes examinations in wide use all over the world and towards some kind of record of achievement system. Here is a passage from Chapter 3 of my recent short book … :* *"The Guardian (3 October 2012) reported a nationwide piloting across 90 universities and colleges of higher education achievement reports (Hears). 'Students and former students, who will govern online access to their documents – up to six pages in hard copy – will be able to provide a more rounded picture of their college life, including sporting, volunteering, employment and student union successes. It will be easier for employers to verify jobseekers' credentials.'* *This initiative has been widely applauded and is likely to lead to a more extensive scheme. Sir Robert Burgess, vice-chancellor of the University of Leicester, who led the pilot study,*	

				has said 'In time, the steering group hopes that the wider information contained in the Hears will eclipse the single degree classification and, where appropriate, serve as a replacement for it." *Just as secondary schools have been plagued by pressure to get good GCSE and A levels, universities have suffered from what the Guardian piece quotes as the "damaging obsession" with first and upper-second degrees. It is becoming clearer that both institutions have a common interest in replacing traditional assessment patterns by ones that give a fuller picture of student achievements. In time, perhaps this will lead both of them to jettison traditional examinations altogether.* **SUBCODE 4.3.2.3** **Assessing *"hidden efficiencies"*** (Participant 2, page 18, line:17) <u>Participant 2, page 17, line:25-29; page 18, line:5-11, 17-23</u> *I would say universities will have to find a way to free our lecturers or free the teachers to … experiment with problem-solving scenarios; they need to free them from the, the rigid assessment that currently exists, they need to free them … so that … the lecturers can confidently use alternative forms of assessment, for example, that is still valid and it's not just an objective, externally set test. So, in my opinion, universities need to find a way to emancipate, actually, lecturers and students so … that teaching can evolve into something that is not recipe-bound … [S]ome of the research that I've read also shows that if you teach a learner to be a metalearner and if you give him the intrinsic virtues, … he or she will not necessarily be able to answer an externally set test as well, as a learner who has been coached in the recipe. So, if you insist on that form of assessment as a be-all and end-all of your assessment, people who are trained like monkeys to do the recipe, will do better. … The hidden efficiencies [the intrinsic*	

			CODE 4.3.3 **Changing architecture to become mobile** **Another change that surfaced is that the architecture is slowly moving from teacher-centred to learner-centred as it becomes a tool that assists teaching.** <u>Participant 2, page 20, line:20-31; page 21, line:1-11,17-18; page 22, line:2-9,15</u> *… [In]broad strokes, you will see that the architecture or specifically the seating of pupils or the displacement of pupils in a classroom started with Socrates or Plato sitting and they had their students sitting around them; also like the Judaic rabbi – the rabbi would be sitting and the people will be informally sitting or standing around. Then we moved into the medieval times and the industrial times, where you had the university format, you know, massive amounts of people facing one way. Now, … slowly, but surely, our architecture … is catching up to what the science is saying actually in terms of what is proper learning. Because … the moment you take the emphasis away from the lecturer and you put it in the hands of the learners then their group work or their cooperative seating comes to the fore. … I saw a company called Steelcase Education and Steelcase is an office furniture company who have now started to enter the school market. And they have … a wealth of science that they could actually now turn to, because the scientific community has been*	*virtues] can be tested using other forms of assessment. If you give learners an ill-structured problem, you will very quickly see who has been equipped to deal with a problem that is not properly stated or … who is trained in meta[-learning], but then you need to test that and you need to assess that. So, … I think that is … the biggest challenge that befalls our universities. They need to find a way to look past our current assessments that is bounding everyone to stick to the recipe because the people need to get … their marks.*	

			talking about transformative learning and social constructivism for a long time, but the classroom practice has stayed behind. So, they have now went [gone] to this established science and … modelled optimal group sizes and what would desks and chairs look like to allow learners to quickly break up into different groups and move around the classroom so that learners can make optimum use of their interpersonal virtues in terms of cooperative learning, to move about. … [T]hey've also designing [designed] chairs that can move that allows learners who are more kinetically based, that need to move around as they focus; so, they've got chairs that you can sit and wobble on without them falling over. They've got desks that they specifically designed with removable white, small whiteboards that can be assembled at a different space in the classroom, so our whiteboards combine to become a bigger whiteboard. So, it's all about fluidity, not the rigid structures of the past. It's all about communication channels – how can you optimally seat your learners so that they can have dialogue, so that they can, as a group, wrestle with problems and so forth? *… [T]hey've got a product that they called the node, which is a chair and desk combination on wheels and, in my mind, learners will start out all facing the same way, each at his own desk, and first struggle … individually with their problem. Only after a certain time has elapsed or after you've reached some form of a point of time, you will then ask them to form groups and these individual nodes will then be combined into bigger groups and then they will go over to the cooperative learning. And then each learner will be able to actually participate in the discussion because they have thought about this and they have an opinion now. So, you equip them to go into that cooperative group.*		

CATEGORY 5	SUBCATEGORY 5.1		CODE 5.1.1		
THE TWENTY-FIRST CENTURY STUDENT The participants referred, interchangeably, to a set of twenty-first century skills or qualities, such as, in random order: critical thinking, curiosity, creativity, communication, cooperation (interpersonal effectiveness), adaptability, technical ability, conceptual ability, multidisciplinary thinking, systems thinking (problem solving and analytical skills by connecting things), common sense, thinking independently. Although all of these are valid, some participants felt, that, essentially, it is the **fundamental human virtues** you need to attain, in order to thrive in the twenty-first century. Thus, first of all, to be a metalearner (attaining the intrapersonal virtues), and therefore taking charge of your own learning. Secondly, to in the process find the truth about yourself and to become self-aware to carry out any action as a service. Therefore, ultimately showing empathy and compassion toward your fellow human beings (attaining the interpersonal virtues). Self-management is crucial as it provides the	**FUNCTIONS OF THE TWENTY-FIRST CENTURY STUDENT** From the interviews it became evident, apart from the typical twenty-first century skills, that the twenty-first century student should be transformed into a human being that thrives in uncertainty. The student should know the truth about him/herself, and therefore, what he/she is capable of, in other words his/her potential. This potential is also referred to as dispositions, qualities or fundamental human virtues. The will is the ontological disposition. The student has a responsibility to carry out an activity as an act of service, by doing it with self-awareness, enthusiasm and without any expectations. Self-management is very important in relation to the above, as one needs to manage "the Self" in order to find the truth about oneself.		***"Man's most important function in life is to discover the truth about himself … 'Who am I?', 'What am I?', 'What am I doing here?', 'Where do I go to from here?'"*** (Participant 8, page 6, line:24-25; page 7, line:2) Participant 8, page 6, line:21-31; page 7, line:1-8 *Now … what philosophy tells us – that man's primary purpose in life is not to be a managing director, or a mother, or a father. We play many different parts in life and it's not to say that those parts are not important, but they are not the most important thing. Man's most important function in life is to discover the truth about himself. Once he's discovered the truth about himself, then everything else becomes understandable – the way that Creation unfolds becomes understandable. Everything then takes on a completely new significance and a new meaning. But this journey of self-discovery is … a process, it's really a process, and it's not an overnight thing, it's not an event, it can take a lot of self-discipline and it requires a teacher, or a school; it's very difficult for one to do it on one's own. … [W]hether you read Emerson or Socrates or Epictetus, or any one of the great philosophers, they'll tell you exactly the same thing, no difference – that man's primary purpose for being here is to discover the truth about himself. In other words, to answer that questions, "Who am I?", "What am I?", "What am I doing here?", "Where do I go to from here?". And so this is very important from a student perspective, because, really, what we're taught most about is the outside world as students, we're taught about trying to manage the environment outside of us. But do we see any improvement? We don't, we actually see things are getting worse, and the reason for that is, probably, that … we're not looking within ourselves and seeing where the fault is within ourselves, and trying to remedy that, and then using that as a basis for trying to understand the exterior world.*		

responsibility to practise discipline to commit to discover that truth.			**CODE 5.1.2** **Students should be *"actively meta-aware"*** (Participant 5, page 14, line:15) Participant 5, page 14, line:14-15 *So, what the student looks like is that they are actively meta-aware and trying to grow along all of the dimensions.* Participant 2, page 14, line:25-28; page 15, line:2-6,12,18-20,26; page 16, line:14-16,22 *So, in terms of the virtues, you've got the intrinsic and the interpersonal virtues. So, what's interesting for me … in my own studies, is that I'm under the impression that currently research is heavily focusing on the interpersonal virtues, especially when it comes to cooperative learning or group work. … I get this theory from my own studies in transcendent learning … The learner needs to be equipped to be a metalearner. So, a learner needs to be able to take charge of his or her own learning. And that involves motivation, that involves reflection … so, those are the intrinsic virtues that a learner needs to equip. A learner needs to be able to handle trauma, because the moment we are confronted with problems that we cannot solve, there's an emotional response and learning is emotion. So, learners … need to have the inner resources to deal with that. … [T]hey need to be real-life, lifelong learners, they need to be curious, they need to be able to persist in their struggles. Those are the things that we need to engender in learners.*	**SUBCODE 5.1.2.1** ***"[T]he being of the human is the be all and end all" … In other words, … the qualities or dispositions."*** (Participant 15, page 33, line:23-24) Participant 15, page 33, line:15-16,22-24,30-31; page 34, line:5-7; page 45, line:5-6,12,24-25 *… A student that says, 'Okay, I have it, here it is, so let's do the job.' It's not getting a lecture. Getting an app. It's not that. It's, like, 'let's do the job, let's get out there and do the job. I don't know what to do, I don't know how to do it, but let's do it.' And, therefore, … the being of the human is the be all and end all of this thing.* *So … as Barnett says so beautifully all the time, that is the pedagogical being of the student, the him- or herself. In other words, and he calls it the qualities or dispositions. And it's the qualities or the dispositions of the human being that will determine that 'I will go in there and how I will go in there'.* *… [T]here are those lists of twenty-first century skills. And one can look that up and all of them are valid. But essentially, you see, essentially, it's the fundamental human virtues [that you need to attain].*	**SUB-SUBCODE 5.1.2.1a** ***"Will is … ontological through and through"*** (Participant 15, page 34, line:7) Participant 15, page 34, line:6-7,13,21-22,28; page 35, line:2-3,9-11,17 *And … we must remember of the ontological will. Will, says Barnett, is ontological through and through. And it is the foundational disposition or the foundational quality … How do we know it's [will is] there? … And this is very simple, if you look at a newborn baby, the newborn baby doesn't lie there, like, just like that. A newborn baby is continually reaching out touching, rolling around because there is an absolute ontological will to learn. … I don't want to call it instinct, because it is not, but, I mean, it's such, such a natural thing. Because that's what the child does! A child … will not just lie there and just "Heh-heh-heh", it's always busy. I mean, can you think of, in terms of a newborn baby or, you know, a few*

				SUBCODE 5.1.2.2 ***"Learners need to transform into human beings that can thrive in an uncertain future"*** (Participant 2, page 13, line:17-18,24) <u>Participant 2, page 13, line:13-18,24</u> *So, learners need to be fantastic at failing, they need … the inner virtues to persist … when they reach impasse in their problem solving, they can't go any further, they need to be able to scaffold themselves as such, because when they head out into real-life there's not going to be a lecturer to give them a well-structured problem with a single recipe to get towards that. So … I would say … learners need to transform into human beings that can thrive in an uncertain future.* **SUBCODE 5.1.2.3** **Being an active participant in the community** <u>Participant 4, page 11, line:30-31; page 12, line:1-20</u> *… In fact, I am going to be guest lecturing in a class in about two hours, Nadine, and my central theme is going to be "There's no such thing as success apart from relationships", so I think the first thing I would mention is some interpersonal effectiveness, the ability to listen, to understand, to be persuasive, all those things that are packed into this idea of emotional intelligence. So, the first is, whether you're in accounting or agriculture or technology, this ability to manage relationships effectively, to impact other human beings in a meaningful way. So … that involves self-awareness and self-management and empathy and all of those things. The*	*months old, can you think of all the stimuli coming in, you know? … I mean, it's incredible what the child does.*

				second thing, I think, would be the ability to manage ambiguity in a way that solves problems. I think students need to be prepared for a lot of grey area, you know, … the world is not the way it used to be, where problems are linear and simple, and one after another, and systematic. And so, I think students need to be able to manage grey area in a way that's flexible and adaptable, but gets at solving problems. And that leads me to my third one, which would be some form of critical thinking – the ability to analyse a situation and to decide what the best behaviours, the best decisions and behaviours, are to address that situation. So, I'm going with 1) interpersonal effectiveness, 2) adaptability in a situation of ambiguity to solve problems and then 3) the ability to think critically to adapt and address situations that change and require analysis. Those would be the three competencies and, to me, they all, they all kind of subsist under the broader context of citizen, which I mentioned earlier, which is a student who sees themselves as, upon graduation or, obviously, before graduation, as a citizen in the world, as a participant in their local community, their regional community and in a sort of a global environment and sort of as a, not just a receiver, not just as an entitled recipient, but as a person who serves in their environment, wherever they are. <u>Participant 13, page 2, line:1-10</u> *The student/human being who is called for in the twenty-first century is a participant, not a spectator – and that begins with having an active or engaged role in his or her own learning process, not a passive sponge of "expert" knowledge. Knowing, teaching and learning are communal processes, and students in our era (actually, in any era) need to know how to participate in processes of that sort. Absent that, they cannot be called "educated" in any meaningful sense of the word. In times of rapid social change, such as ours, yesterday's "expert" knowledge will be refined or overthrown today or tomorrow. In arenas ranging from the workplace to politics,*	

			CODE 5.1.3 **A student has the responsibility to carry out his/her work as an act of service – with self-awareness, no expectations and enthusiasm** <u>Participant 8, page 8, line:6-18</u> *… [A] student has a peculiar responsibility in society and that peculiar responsibility … when I say 'peculiar', you must understand that the word 'peculiar' doesn't mean 'funny' or 'strange', it just means that it's related to that particular role. So, the student, like anybody else, like any other human being (because in philosophy these things are always universal), … has the task of learning a particular or a number of subjects, relating them to the universal truths and then to apply that subject in such a way that they can become an example to others.* *So, it doesn't matter what the subject is, whether it's mathematics or physiology, or whatever it is, but it's to extract the value that is contained within that subject and then to become an example to others, because it's very important, again, from a philosophical standpoint, that any activity has three, what we call 'pure components', in other words, any activity becomes a service when three components are there. And the three components are, first of all, self-awareness, and that means that one is aware of one's inherent divinity, or the Self within yourself.*	*people need to know how to think on their feet, to ask questions that are not yet being asked, and to come up with answers that cannot be found at the back of the book.* **SUBCODE 5.1.3.1** **Self-awareness – being aware of your *"inherent divinity"*** (Participant 8, page 9, line:20) **opening up consciousness and intellect (discerning between right and wrong)** <u>Participant 8, page 9, line:15-31; page 10, line:1-10</u> *… So, the first component is self-awareness, not just awareness. There's a very big difference between self-awareness and awareness. Awareness can make you very efficient, and very effective, and very competent, in what you do, and it doesn't matter whether you're doing something that's constructive or destructive. So, in other words, you can be a Hitler and you can use the power of awareness to become very good at being destructive. But self-awareness is an awareness of your inherent divinity and, at the same time, it opens up consciousness and it opens up the intellect. The intellect is man's power to discern between right and wrong, good and bad, real and unreal. So, that's what the intellect is in a philosophical context. In the normal day-to-day context, the intellect probably has something to do with intelligence, or something like that, but in a philosophical context, the intellect is a great gift … that is bestowed upon the human being only and that allows the human being to access the whole body of natural law through consciousness. So, in other words, you don't even have to go and study natural law – you can access natural law via the intellect through consciousness, which is self-awareness. So, the first great component of activity or of service, and every action is potentially an action of service or an action of disservice …. So something as simple as brushing your teeth can be an action of*	**SUB-SUBCODE 5.1.3.1.a** **Self-management is directly related to self-awareness, which is attained through meditation** <u>Participant 8, page 15, line:14-31; page 16, line:1-7</u> *… [Self-management is] very important and it's directly related to self-awareness, because one has to apply oneself in a disciplined way …. So, in other words, there must be a commitment from man, for example, coming back to philosophical context, there must be a commitment from man to discover the truth about himself, because we're told in philosophy that that's the prime reason that we're here, so that, ultimately, we can merge our existence with the Absolute. But, now, self-management and self-discipline [are] very important and one can do that [attain it] through awareness. But again, without that, it makes life very haphazard and very difficult, but one can be a fairly disciplined person*

				service, where you brush the teeth carefully and afterwards you put the cap back on the toothpaste and you make sure you tidy up after you've brushed your teeth, so that the person who's going to use the basin or the wash area after you, will find it in … as good or better condition. That's an act of service and … the component of self-awareness is there because there's empathy, there's compassion, there's consideration of the other person. *So, this self-awareness is much more than awareness. Awareness is important and we're taught a lot about that 'be in the present', you know, and 'do things in the present' and the literature's full of that; the same as it's full of information about meditation. But actually there's a big difference between awareness and self-awareness. Awareness will make you competent, and good, and effective, at whatever you do, but self-awareness will give you the power of discernment to make sure that whatever you do is done as a service, rather than a disservice.*	*and one can manage one's affairs in a fairly controlled way through awareness, … through practising awareness techniques – meditation is a good example of that, although meditation really is … leads to self-awareness. But any awareness technique, or practising being in the present, will enable one to manage one's own affairs. And we see that people, some people, have a higher propensity to do that and other people don't have a good propensity to self-manage themselves.* *But you see, in a philosophical context, self-management would be where one is managed by the Self, but this inner consciousness, where one allows that to manage one's affairs. And then it takes on a wholly different meaning, because then whatever you do is done … with a different attitude, and from a different point of view. In other words, whatever you do is related to the universal good. So even in the application of self-management … you would understand that you're doing this so that you can be an example to others …. In a way, we're all teachers, … we're teachers to our children, we're teachers to our*

					colleagues, we're teachers to our peers. But the way that we teach most effectively is the example that we are to others. So, self-management is very important, because it does allow us to be good, practical examples to others, and then one is looking at something from a universal point of view; you're looking at something from a universal context, rather than from, "What can I get out of it?", or "How can this assist me?", or "How can this benefit me?".
				SUBCODE 5.1.3.2 ***"Renunciation"* (*"non-expectation"*)** (Participant 8, page 10, line:11**) – to do something when you know it is the right time to do something, without expecting the result** <u>Participant 8, page 10, line 10-31; page 11:1-22</u> *The second component is what, in philosophy, is called "renunciation", but in simple language, in English, we would call that "non-expectation". Now, this goes very much against the paradigm of what is taught to all of our students today. We're taught to do things for results. We're taught that we should have goals and objectives and be very attached to those goals and objectives. But philosophy says "no"; philosophy says that simple self-awareness will allow you to do whatever is appropriate at whatever time, and you will know exactly what the right thing to do is, and that you should never have any expectation about the outcome, because as soon as we do that, then we are imposing our will upon the*	

				will of the Creator. *The Creation is brought into being by a Creator and with it, with this act of creation, rules and regulations are put into place and these are called 'natural law'. So, to the extent that we infringe natural law, … we create a disequilibrium, and that sets in motion forces that seek to restore equilibrium, and those forces can be quite chaotic, and they will act upon the individual that has infringed the natural law. So, in other words, if an individual steals something, they create a disequilibrium. That disequilibrium, through natural law, sets in motion forces that will seek to restore equilibrium and, in the Indian philosophy, this is called "karma"; more correctly, it's called "sanskara" (people say "karma", but "karma" just means "action", but it's actually called "sanskara").* *So, the second component, and it's really important to teach people this, because, for ever, individuals are imposing their will upon the will of the Absolute or the Creator, and this makes us very unhappy, because, as soon as things don't go the way I want them to go, it makes us unhappy and frustrated, and we do things.* *So, you see, the reaction of students now, or recently, … the "fees must fall" and all the other things that they're dissatisfied about, is because … there is an expectation. Rather than using the power of consciousness, self-awareness, to be able access the intellect, to be able to discern between right and wrong, all that they're doing is that they have an outcome in mind and to the extent that that outcome is flouted or not realised, then one resorts to behaviour that is undisciplined and that is destructive. And all that we're doing is, we're setting in motion forces that will seek to restore equilibrium. So, there will always be a price to pay. And the events that have taken place have set in motion now forces that will seek to restore equilibrium.* *So, we're not doing ourselves any favours. So that's the second component of an activity or true service, is that one doesn't have expectations about the outcome, and this runs*	

				very contrary to the way that we're brought up, even by our parents, and our teachers, and everyone; they all say to us, "Have a goal in mind", you know, "Have a …", you know, "… an outcome that you want to realise." But the truth is, from a philosophical point of view, that all you need to do is discover the truth about yourself or embark on this journey of self-discovery and then no goals are necessary. It's not to say that one doesn't do any planning or anything – that is very important: you can't pitch up at the airport and say, "Look, I belong [to a] philosophy school and we don't believe in booking in advance." *So, planning is really important. It's a conscious activity. And one is not discounting the importance of that, but what is really important, … from the Upanishads, from the great philosophers, who tell you quite categorically that it's not useful to have preconceived ideas about the outcome of an activity, because that outcome, largely, will be determined by natural law and you'll have very little control over it.* *But to the extent that you apply yourself, consciously, in an activity, you have control, you can have control, because, now, the power of consciousness is something that you're working with and it's a pool of incredible creativity and potentiality. So, that's the second component.* **SUBCODE 5.1.3.3** **Enthusiasm – be enthusiastic** <u>Participant 8, page 11, line:22-31; page 12, line:1-5</u> *The third component is very basic and simple – and that's enthusiasm. So, any activity that one embarks upon, and this would apply to students as well, it's really important that they're enthusiastic about their studies. I [will give you] my example, you know, where my mother had an idea about something that I should do and I wasn't enthusiastic about it at all, but I decided that I would, you know, follow her thinking and the end result of it was*	

				that I bowed out of it. She also wanted me to take piano lessons at a very young age and I just wasn't interested in that, so I left that as well. … The etymology of the word "enthusiasm" is "en-", "E-N", is "with", it's a Greek word; the etymology comes from the Greek. "E-N" means "with" and "theos" is God. *So, when you do something with enthusiasm, you're doing it with self-awareness. … The real key to everything is self-awareness. Self-awareness takes care of, actually, the second point, which is renunciation or no expectations, and, in a way, it also takes care of enthusiasm. But, for ease of application, we use those three components, which are necessary for the completion of any activity: self-awareness, no expectations and enthusiasm. And then the activity's bound to be successful.*	
			CODE 5.1.4 **Twenty-first century skills and abilities**	**SUBCODES 5.1.4.1** **Such as technical ability, conceptual ability, analytical skills, desire to keep learning, ethics of learning, anticipatory learning and deeper historical knowledge, the capacity to unlearn** <u>Participant 9, page 15, line:27-31; page 16, line:1-17</u> *… Number 1, … curiosity and a desire to keep learning; number 2, … both a technical ability and a conceptual ability to know how to acquire new knowledge. That literally means, you know, being skilled at going on the Internet and going [to] other places and knowing where to find stuff. So, that's a skill set which a lot of people don't have. You could describe another one as problem-solving, analytical skills. So, when you look at information – that's a challenge for a lot of people – when you look at information it isn't just to remember, but it's to ask, 'What does it really mean and where does it go next and what are the implications of it?' So that's problem-solving, analytical skills.* *The next one is, you can call it, it's kind of an*	

				ethics of learning, … and you, sort of, use that, this skill when you ask, "What are the dark sides of technology?". It's the ability to look at what is the, sort of, upside and downside, or light side and dark side, of various kinds of actions and technology developments, and so on. So that ability to assess not just all the positive outcomes, but the, sort of, unintended consequences of things and that's a little deeper skill, that is not taught as well, except in certain programmes. *And then, … to … be future-oriented, … to not just focus on the way things are, but to ask, you know, "What are the trends?". And to have an ability to anticipate (you can call it anticipatory learning). But I should add to that, I think an overlooked skill these days can actually be … [a] deeper historical knowledge to really understand historical patterns and themes and how we got to where we are.* *So … if you unpack that, you'll have about a half a dozen key skills, attitudes and abilities, if you will, for the learner in the twenty-first century, I would say.* <u>Participant 14, page 7, line:29-31; page 8, line:1-10,12-23</u> *The first quality a student needs is the capacity to unlearn … Diplomas have expiration dates. That means whatever you learn is useless in so many years. So we are in a major dilemma that so much of what we learn is presented as a reality, and nothing but a reality, and it can only be the reality; that means that it becomes dogma. It becomes the truth above the truth. I mean we have that, definitely, today in economic theory. We believe that free trade is the best there is and, even when there is clear proof [that] free trade is a disaster for 190 countries around the world, … [we] wish to continue because we have been taught that free trade is good for you, and we believe it, so dogma. The problem is that we have to be prepared to unlearn whatever we thought is the most important characteristic of anyone who gets to the age of undergrad studies, is to be prepared to unlearn. Unlearn what your father said was true, unlearn what your mother said*	

				was true and unlearn what you think is the truth today. So, to me, this is the greatest capacity, what we need is flexibility in the mind to unlearn. *… [W]e need … to have an insatiable desire to connect things. I will give you an example, if we are talking about overfishing then, somehow, we are thinking we are too many hungry people, and too many people fishing because we are hungry, and we need food, and we need protein. I can confront people with a picture of what we do with the female fish that have eggs. We kill them, and we even eat the caviar. Now, there is nothing more absurd than killing a mother with eggs and then saying we have no more fish. It means that can we make the connection between our behaviour, our consumption, whatever we eat and our totally unsustainable production and consumption system we have set up. That means that we need to connect, we need to see connections; so the learning is not the skill as I know how to drink this [the juice we ordered at the restaurant] without a straw because the straw is the major pollutive for fish in the ocean, I can drink this because I know that actually I don't need a straw. I never needed it in the first place; I can perfectly do this without.*	
CATEGORY 6 **THE TWENTY-FIRST CENTURY LECTURER** This brings me to the last category, focusing on the lecturer. "What would it mean to be a lecturer/teacher in the twenty-first century undergraduate university classroom?". A couple of aspects, such as the responsibilities of how the lecturer should function not only as facilitator of learning, but also as a	**SUBCATEGORY 6.1** **FUNCTIONS OF THE TWENTY-FIRST CENTURY LECTURER**		**CODE 6.1.1** **The facilitator needs to design the most powerful learning environment to evoke all of the student's potential** <u>Participant 15, page 47, line:4-5,17,23,30; page 48, line:5,11,17-18,24-26; page 49, line:2,14,20-21; page 50, line:2,8; page 51, line:2-3,9,15,21,27-28; page 52, line:2</u> *… [T]he facilitator of learning needs to design. Now what does 'design' mean? 'Design' means two things. 'Design' means, first of all, it must be creative. Is that fine? Because it is a design, it's not a planning, it's a design.* *But at the same time, why is it a design? Because when you design it's very structured, isn't it? … Right, so it's both those things. So it's not just,*	**SUBCODE 6.1.1.1** ***"[Wanting] your learners to have the same experiences than [that] you have"*** <u>Participant 15, page 62, line:9-11.17-18,24-25,31; page 63, line:5,11,17,29; page 64, line: 5-6,13-14, 20,26-27; page 65, line:14-16,22-23</u> *Why do you think that [someone has] become a teacher? Surely, number one, something happened for that person … let's call it an "aha moment", to say "I understand maths! I understand maths!" But here is the point, how did that come about? Was it a teacher that was teaching the maths or was it that student that says, "Aha! I could now do this thing!"? So what it is, therefore, essentially, if you think about it deeply, why you have become a*	

human being, feature here. From the interviews, it became evident that, apart from being an expert in his/her field, the twenty-first century lecturer should be a true facilitator of learning, thereby facilitating the student to reach his/her full potential by providing the student with an ill-structured problem, in a powerful learning environment, so that the student can attain the intra- and inter-fundamental human virtues. The facilitator of learning should see the student as a human being and provide the student with emotional support. The facilitator of learning should also be a lifelong learner him/herself and carry out any activity with self-awareness, enthusiasm and without any expectations.			*you know, an airy fairy thing. It's design; the most powerful learning environment possible. So, therefore, now, first of all, the facilitator of learning comes into play. That person needs to design … , the most powerful learning environment possible that will evoke the learner's own empowerment.* *So that design is not simply … we walk in the veld and we know; [but] it's a very, very prudent design that has to be so much so that when the learners are confronted in and through this environment, that it evokes here, deep inside their being, the will and the want that empower them.* *So it's critical. So you cannot have a lecture hall. It must be personalised also to the learner. Right? This environment, but we'll come to that just now. But can you see that? So, how do you do that? That needs to be designed. In other words, it has to evoke all this potential to come to the fore. If it doesn't, it's a problem. … So, it's a completely new thinking, especially in … terms of the student. The student needs to stand there and says, "I don't know how to do this".* *But it must be a question that I [the student] want to. So it [the design] must be, in that sense, it must be personalised. Right? It doesn't mean, only to you, but I need to feel it; if it's us as a class of students, I need to feel it personally. Of course, communally, but personally.* **CODE 6.1.2** **Provide students with an ill-structured problem to solve so that they are forced to develop through trauma** <u>Participant 2, page 16, line:31; page 17, line:1-5,11-18</u> *Okay, ideally, the lecturer will have to be a facilitator of learning in the sense that the lecturer will have to have the courage to give learners problems they cannot solve. In other words, as Kapur would say, ill-structured problems, because it's only when learners are confronted with a problem they perceive as to be being beyond their current capabilities that*	*teacher or a lecturer, is you want your learners to have the same experiences than [that] you have. Unfortunately, we think, if we give them the knowledge, they will have the experience. Not realising that it was not that someone had given me the knowledge but that I have gone through this process which made me the valuable lecturer that I am, or student or whatever the case may be.* *… So what makes me? I have to live, I have to live life within the context and the interconnected, uncompromising complexity of the stuff that it's made of.* *… So what it should mean is that you need to have experience so that you can look at life, find something, … that's the creative process. So find something in its uncompromising supercomplexity and you take the students and you confront it with them. … So that's it. And, of course, then the facilitating learning. Because, remember, it's very important, you have to confront them, of course, and then they have to do the job. Now, this is critically important, this is what people still don't understand about authentic learning. Because only when they individually, alone, start resolving the challenge are they learning and, therefore, have to manage themselves.* **SUBCODE 6.1.2.1** **The facilitator first provides only emotional support** <u>Participant 15, page 67, line:25, page 68, line:2-4,18,24,30</u> *… But [the student] first ha[s] to work alone, individually. … [The facilitators] [j]ust encourage and support, emotionally. … [T]he intrapersonal, is also a relationship. It is with [myself]. I cannot, unless I know [myself], I cannot go into a good relationship with you. Because then I might take your identity.*	

			growth can happen, because they exceed their current capabilities, they are forced to grow, because they're currently not equipped enough. But then that facilitator needs to be able to facilitate this in a situation where despite of the fact that these learners are experiencing trauma … they want to persist, they want to, and then we get to the place where the problem with which the facilitator engenders this learning needs to be so precise and of such high quality that learners cannot do otherwise than want to solve this problem. So, lecturers need to become expert problem-givers; they need to become experts at what problem can I give these learners sitting in front of me, so that they can struggle with it, and in the struggling process, they need to discover all the knowledge that the lecturer would just have given these learners in the normal transmission paradigm.	**SUBCODE 6.1.2.2** **The community of truth – we challenge our intra- and inter-virtues** Participant 15, page 69, line:11-15; page21-24,30; page 70, line:5-7,13-15 *… Number two is, now that you've done your intrapersonal and you've really, and you've resolved the thing and I've resolved it, now we're in the community of truth. And now you ask me and you challenge me and you say, "That's nonsense", and you say, "How can you say that?", and you can say, "Come and show me", and you can say, "Give me evidence", and I need to do that. And, in both these cases, can you now see what happens? … Parker Palmer says it so beautifully; in one of the quotes he says, … "I, … confront you, you know, and I challenge your … definitions, and I challenge your constructions, and I challenge your assumptions. Indeed, I challenge you." And what do I challenge, therefore? Your intrapersonal, intra- and interpersonal human virtues. So, "Can I ask you a question, therefore?". You need to have the courage to expose what you find. And with courage say, "But this is my conviction about that". Not*	

			CODE 6.1.3 **To be an expert in their field** <u>Participant 12, page 16, line:5-18</u> *… [O]ne has a responsibility to be on the inside of worthwhile forms of knowledge and understanding. So, nothing I've said should be seen as, in any way, a repudiation or a criticism of fields of knowledge and understanding. … It's been said on more than one occasion that university teacher[s] should have two loves – they should have love of their subject or discipline and the love of their students.* *So, they've got to get on the inside of a field of knowledge and understanding. I'm not saying they've got to be fully paid up researchers – I think that's going too far – but I am saying that they should be on the inside of a field of knowledge and understanding, should care about it and should be active in it in various ways. They should be going to conferences, they should be reading the contemporary literature, they should feel that they're part of a worldwide community in a particular field of knowledge and understanding and be able to bring that excitement and that passion into their teaching situations.* **CODE 6.1.4** **See how their work connects with a global context** <u>Participant 12, page 16, line:18-21</u> *… [T]hey should have some sense of why their field is important to the world and see all the possibilities for the ways in which their field can connect up, and does connect up, with the world, and the world in all its forms, so that they can help to put the student into that national and*	*because you want to convince me, but because you say, "This is me". Then I do the same with you. And then you learn from me and you say, "Oh! I like that, what you said", so I can now change what I have said because I can hear what you have said.*	

			global context, particularly global context … **CODE 6.1.5** **Seeing the student *"as a person"*** (Participant 12, page 16, line:22) <u>Participant 12, page 16, line:22-26</u> *… [T]hey should have a sense of the student as a person, not as an adjunct, not as a passive assimilator of research and knowledge and neither of the student as a powerful customer to which they have to respond, but of the student as a person, making their way in the world and, almost certainly, as a person who is going to face incredible challenges in their life and in their professional settings as they move, of course, from one professional setting to another.* **CODE 6.1.6** **Being *"imaginative"*** (Participant 12, page 17, line:5) **– not only in, for example, a module, but more in a specific moment between you and the students** <u>Participant 12, page 16, line:27-31; page 17, line:1-14</u> *… They, of course, they also have their own challenges and tasks of managing their professional situation within their own university, so university teachers themselves these days are, I think, put in very challenging situations; a lot is expected of them and rightly so. So, it's not at all easy being, I think, a professional teacher of the kind I've been talking about; and I just slipped in the phrase 'professional teacher'. I think we have to be very professional about what the university teaching is.* *It's neither running a business, nor is it simply, as it were, parading one's research, and neither is it simply of responding to customers. But it is a highly complex matter, of being adept in situations, being responsive to the totality of the possibilities that are coming into play.*		

			And this means, to use the term I haven't used so far, being imaginative. Not only being imaginative in framing a curriculum, but by not only being imaginative about, say, a module or a unit, a teaching unit, and how it may go forward, how it might fit in the spaces and challenges that might open to a student, but being imaginative in a moment, in a particular setting, in a particular day, in a particular situation that you find with students, either collectively in a classroom or an individual student – you're, all the time, thinking at different levels, different horizons, different possibilities, different technologies, different opportunities, different networks, different spaces. *All of this coming into view all at once – things are fizzing and buzzing. And of course, these days we can be imaginative about how we open students to each other, because they can help each other in incredible ways.* **CODE 6.1.7** **Having the three components of an activity: self-awareness, no expectations and enthusiasm, and seeing the subject in relation to a universal context** <u>Participant 8, page 18, line:8-31; page 19, line:1-20</u> *… [What] is very important from a lecturer or a teacher point of view, is to teach children to think independently, not to pile them with mechanical work and textbooks and things like that, which they're required to learn very often in a parrot fashion and then to repeat in examination situation, but rather to be able to think independently about situations. You know, there's [there're] a lot of things in South Africa, in particular, that are happening in the political arena right now. It's important for students … to have an informed and reasonable opinion about current affairs. And also about their own subject, you know.* *So it's not just a case of reading a textbook, where you may get one particular point of view from an author, but rather to apply yourself in … as wide a spectrum as possible, to apply the mind*		

			in as wide a spectrum as possible and to examine those principles or ideas that are being presented to you by a particular author. And to ask yourself, 'Well, is this right?' … . And that's where the power of the intellect comes into being, because every human being, as I said earlier on, is imbued with this great gift of intellect and that is nothing other than reason. It's reason. And again, Plato speaks about this all the time …. So, reason is very important, because it gives us access to the power of the intellect and it allows us to discern between that which is right and that which is wrong. *So, I think … – to answer your question – as part of the teaching process, the teachers need to understand this. Now, what you find in our education system, and I'm involved in the lower education system, you know, particularly in primary schools (we're starting a high school now). But what you see is, you see teachers who have no idea about this, they have no understanding about this. So the teachers have to be taught. So … first of all, the education that a lot of the teachers have gone through is frightening, quite honestly, it's really bad at the moment, particularly the government type of education; the private schooling education is much better and it's [of] a much higher standard and you have things like the Cambridge system, which is being introduced into South Africa now, which is a completely different methodology.* *But also, teachers need to be taught. Because, how can teachers teach students values if they themselves don't have these values? If they're not manifest in them? So, the teacher is all-important and if the teacher is able to teach with this idea, with these components of self-awareness, non-expectation, no expectation from the student in particular, but just to teach and to do it the correct way, and to have no expectations about the students and what happens with the students, and to do it with enthusiasm.* *My experience in primary school teaching, where I've attended many classes, is there's an absolute lack of enthusiasm. So, where a teacher teaches from the heart, with enthusiasm, then you get the attention of the students, you know. They appreciate that. It's not just the [a] case of*		

			mechanically reading out notes and saying, well, you know, 'This you must study, now take it home', but it's actually teaching in a completely different way – teaching from the heart, with enthusiasm. And the student will quickly detect whether the teacher has a knowledge of the subject that is much deeper than a sort of surface-appreciation of the subject, but rather a really intrinsic knowledge and intuitive-type knowledge of the subject. *And again, I refer you to that Chandokya Upanishad, where he said … where the teacher says to the young student: "Be careful, because everything that you know is just information and names and that means nothing. If you want to really explore the limits of the subject which you know and which you have been taught, then you have to be able to relate that subject to the Truth. If you can't and don't relate it to the Truth, then you'll never be able to move fully within the limits of that subject."* **CODE 6.1.8** **Fostering the relationship between the student and the discipline** <u>Participant 18, page 10, line:29-31; page 11, line:1-14</u> *I have a metaphor for the role of a teacher/coach/mentor, which guides my thinking. And my metaphor is a campfire, where the fire in the middle is the discipline (for me it's chemistry) and the students with the lecturer are sitting around the fire, shoulder to shoulder. Each one looks into the fire personally – each one has a personal relationship with the discipline – and the coach or lecturer or mentor (the role played by the lecturer) is essentially introducing the students to the discipline, introducing those campers to the fire, so that that fire could jump into their own hearts and become their personal passion; it's a personal engagement which is merely facilitated by the lecturer. Of course, with much more experience and, of course, with the sensitivity of what each one needs. And it's also the role of that lecturer to manage fear and … directly speak to fear which is present as a silent*		

			partner in any class situation. I'm so aware of that in chemistry, where I'm teaching, the so-called most difficult, most challenging, subject, the gatekeeper internationally. So you've got to address fear. You do so by building the confidence of each of your students as they sit around this circle, because the same fire will burn them. They need to come closer, but they need to respect it as well. But fear is that silent, constant companion. So, for me the metaphor is that gentleness and the awareness, but the commitment of the teacher to make sure that a personal relationship grows between each student and the discipline, because that needs to be the fire that takes them forward long beyond the life-expectancy of the teacher. **CODE 6.1.9** **Lecturers as neuro-educators, being people *"who will activate and engage the executive functions"*** (Participant 1, page 11, line:34) <u>Participant 1, page 11, line:33-34; page 12, line:1-6; page 13, line:9-33; page 14, line:5-13</u> *We also need teachers who will activate and engage the executive functions that I've mentioned before, that are still undergoing their rapid maturation changes through the mid- to late-twenties and are even more critical in today's globalised and technological world with automation and computerisation and outsourcing. So, students, even more than the actual facts, which change so frequently as new information is gathered, students need very honed executive function skill sets of judgement, cognitive flexibility, critical analysis, media literacy, deductive and inductive reasoning.* *… [L]et's go back to what the teachers specifically need to know about where we've gotten in the neuroscience of learning and in the process of building that knowledge, whether it's, whether it's from reading books, journal articles, having professional learning communities, attending professional development or taking classes online or in lecture halls, but truly great ones are, can be found online without fees in neuroscience or cognitive neuroscience so that*		

			they'll have the information as we have it to this point, but they'll also become equipped to continue to learn and able to understand and apply the subsequent and future outpourings from neuroscience that are going to accelerate with things like the Connectome Project and diffusion tensor limiting, diffusion tensor imaging and a new generation fMRI scans. *Okay, so I would put the must-know information into three categories and one of them would be RAD, … And RAD stands for the first part of how information gets through the brain to become potential memory and understanding. And that would be 'R' for the reticular activating system, 'A' for the amygdala and 'D' for dopamine. So those together are one of the three. The other is the power of active mental manipulation to construct long-term, durable concept memories, and the third would be activating and incorporating the executive functions throughout learning experiences, and that one we've already described. We've also done much of the description earlier about mental manipulation and memory. So, going back to the important aspects of RAD, these are things that teachers need to know and know well enough so that they can share this knowledge with colleagues, turn it into strategies when they see the need for it, and so they can explain it to their students, because this is very empowering self-knowledge for students to know about how and why their own brains are processing successfully or unsuccessfully. So the first part of this RAD would be 'R' – reticular activating system. Or 'R' could be for reaching attention. And I will continue this on a next segment.* *… And there're things that teachers need to know for two reasons. First to be able to use the information when they are planning and carrying out their instruction, if they're going to have the goal of preparing students and learners for the twenty-first century and the other is so that they can teach this information to students. No matter what course they teach, it's important for students to recognise these parts of their brain so that they also can have the awareness to promote their own brains with their most efficient responses and processing of information,*		

			because, indeed, knowledge is power and brain power is what will prepare and sustain learners for the challenges and opportunities of their twenty-first century. **CODE 6.1.10** **Twenty-first century skills and abilities**	**SUBCODES 6.1.10.1** **Such as being lifelong learners, learning from students and adapting to technology** <u>Participant 1, page 10, line:23-34; page 11, line:1-33</u> *All humans are best served, as is the planet, when they are lifelong learners and teachers, … you hear teachers say, but when the teachers who authentically follow through with the idea … they can and learn as much from their students as their students learn from them. And that is very true, very important, and I suggest that as a thinking point, that teachers be invited to think about and share what, in fact, they have learned from their students and that, for those who can't think of what they learned or don't feel they've learned from their students, I think that, in itself, is revealing, and should be revealing, because, that teaching and learning is a two-way relationship.* *And just because they haven't been able to perceive the impact that their learners have had on them, doesn't mean that it wasn't there. So we want them to increase that awareness and the ability with which they use what they learn from their students to become better teachers and to help their students be better learners. And that, what they learn from their students, goes all the way back to practices that are important in lower grades – elementary school – and to connect with learners. But to have learners be most engaged is to know how their attention filters work and to use the strategies that activate it. Now, in terms of teaching students now in the twenty-first century, the digital age, the technology age, it behoves teachers to recognise the pull of technology on students who are in class with their devices, and the brain, as you'll see for attention, is wired to seek things that are new, different, changing, curious and/or perceived*	

				to be sources of potential dopamine pleasure and reward. And if students are being distracted or pulled away from the lecturer and onto the devices that they have with them, and even if they are told to not have out their laptops, which is, would be infantilising them, would be inappropriate, but the, even if they were to, they will have access through their smartphones, smartwatches. *So the ubiquitous availability and compelling nature, the interactive nature, the multi-media nature of the Internet and social media is something that teachers need to adapt to, rather than try to ignore or keep students away from. And, back to the whole big picture of … is there relevance or appropriateness for lecture-type experiences classes now, especially as I mentioned because of the economic considerations and the fact that the brain doesn't learn as well without being actively involved and interactive in the learning process. So if, with these concerns, and also with the attention-compelling source right with them, teachers need to reconcile that with becoming the source of information and, more importantly, of guiding students to find their information, find their own answers. And that could be done by incorporating an online interaction embedded within the lesson experience and using media as forms of demonstrating, as forms of bringing up provocative incidents, that could lead to a discussion that is on the topic, provoke curiosity and predictions and the use of technology that helps, that allows a teacher to put a class into groups based on like or dis[like] … [or like] or unlike responses to a prompting question and on a screen, based on clicker response of the students, groups can be put together of people who had similar responses, let's say, to a multiple-choice question with four possibles [possibilities] and they could be put together, or they, Bs could be with As, in terms of those who answered A could be with Bs against, and debate Cs and Ds.* *So the technology is there to engage and even, instantly, put students into groups for*	

				discussion. Okay, so the twenty-first century is going to require teachers who know how to incorporate technology and, especially in big classes, to use it in order to personalise, individualise, as much as possible the learning experience and allow students to mentally manipulate and engage with learning through responsive clicker-type responses.	

APPENDIX E: ACTION RESEARCH SPIRALS AND CYCLES

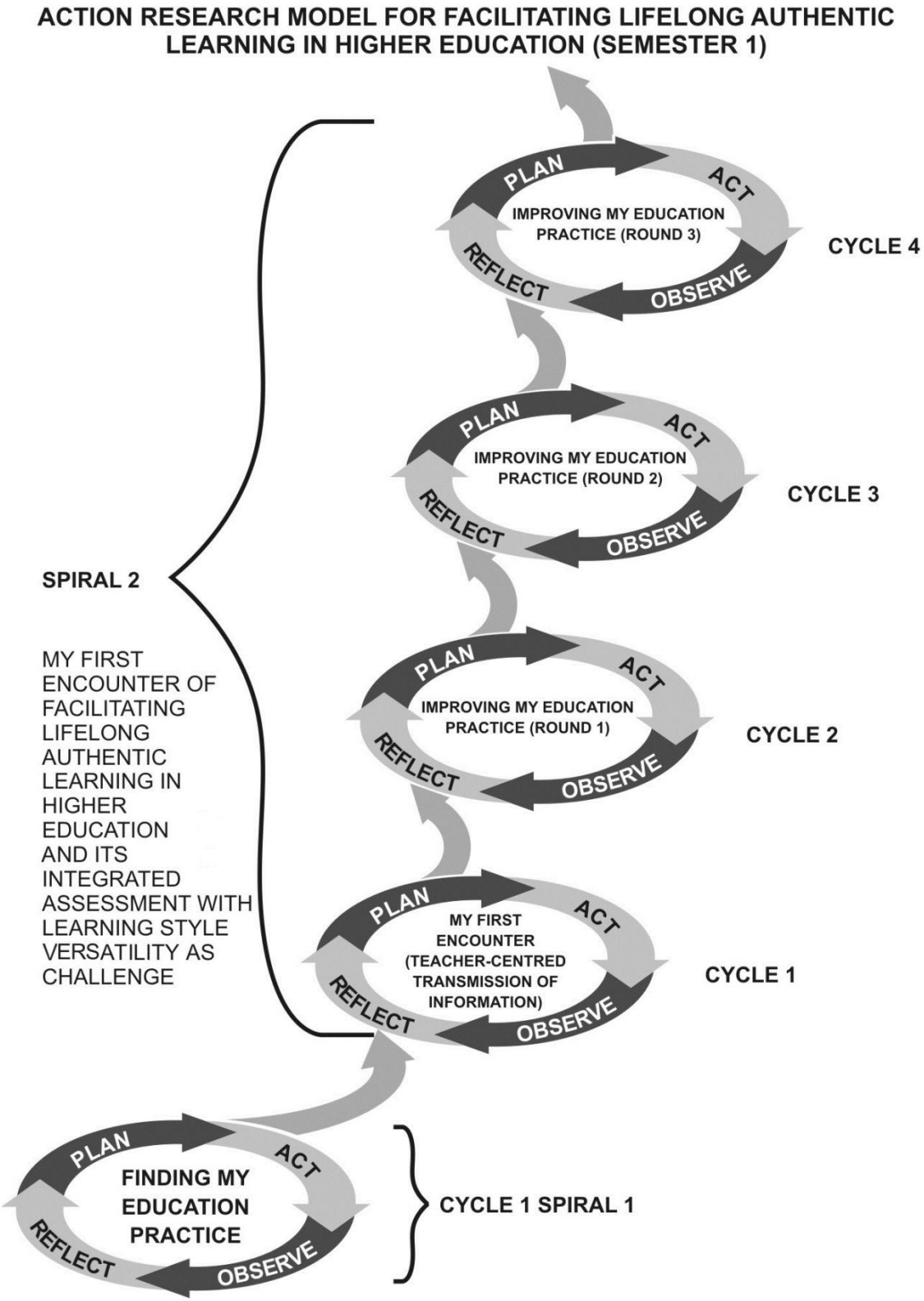

Figure 16: Model of my action research: Semester 1

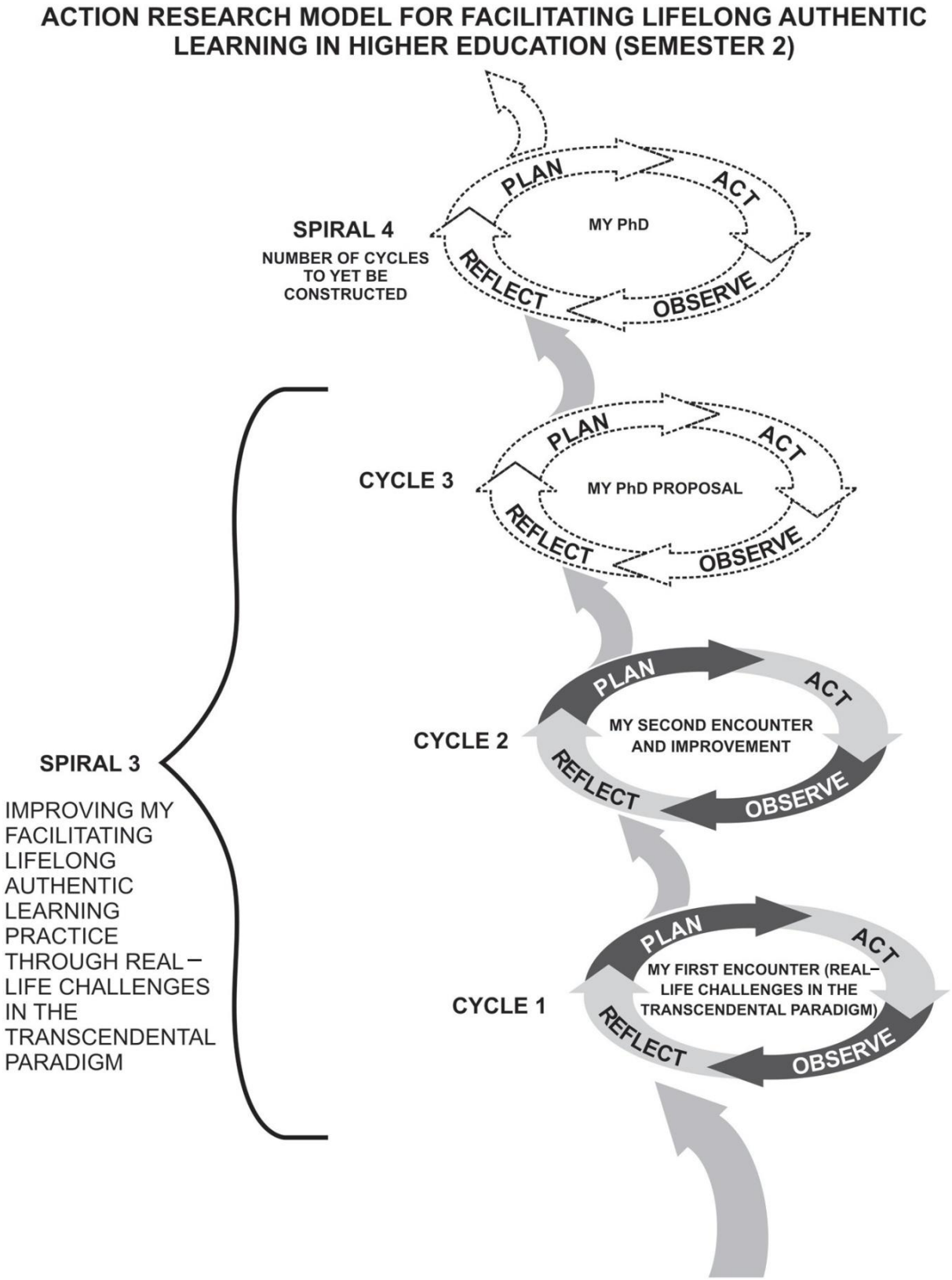

Figure 17: Model of my action research: Semester 2

APPENDIX F: THE TRANSCRIBER – INTERVIEW QUESTIONS AND ANSWERS

1. **What is your opinion on the research that I am carrying out - in other words – what do you think of the research that I am involved with?**

   I think asking the question 'What does it mean to be a student in the 21st century?' is really important, because I think it's not a question that is often asked outright. However, it seems to be a difficult question to answer, because just being a human being in the 21st century is so complex, with so many facets of life having to be navigated and managed (especially with this whole new 'extra' reality of the internet in general – the availability of information and opportunities –and social media and other distractions in particular). So being a **student**, i.e. being in a life stage where one is being prepared (to a greater or lesser extent) for life in the 21st century, seems to me to be even more complex. In fact, it is so complex that I think people don't really think about it in a self-conscious manner; from my experience as a student, most students (and even educators) seem to be just swept along by, for example, the masses of information and media and technology, without exercising real control over it, i.e. consciously using the facets of technology to their advantage. So, I think even **starting** to think about what it means to be a student in this age, i.e. consciously grappling with the issue – what your study seems to be aiming at – is crucial, both for educators and students.

   To me it seems like the study sets a good baseline for actual change in the education system, it's not just posing hypothetical solutions, but it investigates the most fundamental issues surrounding education – humanness and human potential. The reason I say this is because this study has not only involved education experts, but also participants from many different subject areas, in real-life situations apart from the education system per se, who were able to identify both the shortcomings of the current system and the challenges of the 21st century. To me, a strength of this study therefore seems to be that it showcases the importance of education as the basis for all of life as a human being and the need for change in how education is being done in the 21st century.

   Following that line of thought, I think another strength of the study is its focus on the student or learner **firstly** as a human being, i.e. holistically, and not just as someone who has to achieve academically and fulfil a 'successful' career (i.e. pragmatically oriented education). This is something that I feel is sorely neglected in the case of many students, as it is mostly those students who are naturally academically strong, sporty, arty or extroverted that really get the full

benefit of the current education system. The potential of those students who are not 'natural achievers' or are 'average' by our modern standards (e.g. because of poor household circumstances, poverty, lack of self-confidence, lack of parental guidance, etc.) are not necessarily helped to reach their full potential by the current education system itself, which is very achievement-driven and competitive. Of course, there are exceptional teachers who are able to help such students.

On the other hand, I also think the focus of your study on a **student's** own responsibility amidst the challenges of the current education system and life in the 21st century is crucial. In the end, to be a successful human being in the 21st century, one cannot continue to blame other people or the education system for one's own shortcomings or failures, or expect other people to 'spoon feed' one for the rest of one's life and/or career. However, for those students who are not natural responsibility-takers, self-managers or who are not naturally self-aware, it is the responsibility of educators (along with parents, of course) to facilitate the development of these qualities. I like how this study seems to be saying that education in order to deliver successful human beings is a combined effort between educators and students; that relationships are at the basis of this effort.

In terms of the auto-ethnographical aspect of the study, I found it really interesting, but know too little of it to really comment. One thing I can say is that it seems to be a profound experience and curiously applicable research method, as you seem to be exploring **yourself as a human being** while your research question fundamentally focuses on **humanness**; in an almost poetic sense the study seems to come full circle.

2. Could you please elaborate on the following two aspects:

a) The effect of the content of the interviews on you, i.e thát of the answers given in the interviews by the participants.

The interviews and thinking about the question of not only 'What does it mean to be a student in the 21st century?' but also of 'What does it mean to be a **human being** in the 21st century?' has had a profound impact on my life. Firstly, it has made me reflect on myself as a student (in the past and hopefully in the future as well) and has facilitated a deeper sense of self-awareness by touching on the fundamental human virtues, the role of relationships in education, self-management, critical thinking and being responsible for one's own learning.

In terms of practical effects, it strengthened my suspicions about the negative effects of especially social media on one's ability to learn and interact with others. Consequently, I have quit all forms of social media, which I came to view as just another 'level' to manage in an already 'super-complex' world, which often steals time that could otherwise have been more productively used (e.g. on reading or actually interacting with people). On the other hand, I have also come to realise the potential of technology (the internet in particular) to facilitate independent learning and I have subsequently enrolled for courses via Coursera and FutureLearn in classical music history, philosophy and the theory of translation. This has further promoted my personal growth both intellectually and even spiritually.

On a deeper level, the study's focus on the student as a human being has opened my eyes to myself as a human being, with interests and a **being** outside of the field in which I was trained (environmental sciences). It has rekindled my interest in the arts (specifically music and literature) and other intellectual pursuits (theology and philosophy in particular), which I now view as essential to life as a **human being**. To put it differently, even though I still think practising one's career and contributing to the economy of the country is very important in the 21st century, I have come to realise that the most important thing is not what one does, but **what sort of a person** one is (and the humanities – geesteswetenskappe – including educational sciences is crucial for this). This in turn has made me rethink the way I view religion – Christianity in my case – and I have realised that **being human** (i.e. having an emotional, intellectual and physical life on top of having a spiritual life) in all its glory and depravity is essential to understanding God and His plan of salvation through Jesus Christ. I also happened to read CS Lewis's Mere Christianity during the time of the transcription and he says that Christ wants all of you: 'I don't want so much of your time and so much of your money and so much of your work: I want You.'.

The importance of relationships, i.e. how I myself stand in relation to other people, is crucial in this age of individualism (at least in the West). The importance of empathy, relationships and mentorship came up in many of the interviews. I realised that empathy is an outworking of self-awareness and -management in that the natural self does not always want to be empathetic or seek relationships, but that self-awareness and, consequently, self-management (because to be self-aware means that one knows **what** to manage in the self), enables one to actually be empathetic (or to at least practise being empathetic) in situations where the natural self would not have wanted to be empathetic.

Critical thinking is another 'theme' that reared its head in many of the interviews. Having been stimulated to pursue more self-awareness, I have come to realise that critical thinking is something that is supressed by most educators (and even most people in general) and it is something that is not encouraged even on a tertiary education level. I believe children are natural critical thinkers, often asking 'Why?' questions, but that quality is suppressed in most learners as they mature. So, I now try

to actively practise my critical thinking (luckily my husband is naturally good at it, so he helps me to see what questions to ask whenever I am exposed to new information – which is often in this digital information age). I also now view critical thinking as flowing out of self-awareness, even of being human.

Generally, this study as strengthened my beliefs about the shortcomings of the current education system and how it focuses on achievement and not on developing human potential, which includes self-awareness, self-management, empathy/relationship, critical thinking and spiritual awareness. Nonetheless, I now see how the responsibility of mitigating and eventually overcoming these shortcomings lies with both the education system (which I cannot change anymore, but hopefully studies like yours could) and the individual graduate (i.e. reaching my highest potential is now in **my** hands).

So, I'm really grateful to have had the opportunity to be a part of this study.

b) Your opinion of the interview participants.

As I mentioned in Question 1, I think the fact that the participants were from such a broad array of disciplines is a strength. There seemed to be many recurring themes (empathy, critical thinking, etc.) in the interviews, which is interesting exactly because the participants were not all connected in terms of their fields of expertise.

I feel privileged to have listened to experts whom I never would have had access to. Somehow the whole experience of listening to them has in some way made the topic a reality in my own life (to latch onto the previous question); it has been educational in its own right.

APPENDIX G: LETTERS OF VERISIMILITUDE

Letter of verisimilitude from Mr Conrad Geldenhuys

Conrad Geldenhuys
9 Republiek street
Springbok
8240
c.geldenhuys@hotmail.com
(+27) 027 718 8800

Dear Nadine,

It was a privilege to read your thesis and get a different perspective of the science learning environment. Having received our postgraduate science education and training through the very same department, approximately in parallel (I was a year or two ahead of you and we met in your Honours year) and even the same supervisor, it was interesting to compare experiences. Even more so the lead up to that point in one's life. How one's home life, learning environment and important formative figures in one's youth contribute to moulding the individual. I was further surprised at our similarities in those formative years. At how an academically high achieving and promising learner throughout primary and most of the secondary school, seemed to lose the plot a bit towards the end. A somewhat lost matriculant faced with the decision to find a future direction of tertiary education independently, without an educational trust fund, followed by the same decision process at postgraduate level. The only major difference was that my undergraduate education was through a distance learning institution.

It felt immensely personal to read through your work, even emotional and disarming, which is quite unexpected for a person used to the cold, hard, fact-based, cause-and-effect, milieu of the science environment. Unlike your journey – of which I now realise I only had a limited view of as you passed by my life's window – I continued on the science road. The very same Goegap Nature Reserve around which much of your Honours and Masters years revolved were also my port-of-call in my Honours year, and we conducted some field work together. Although I did not have a project there at the time, it ended up becoming my permanent home through a job opportunity that arose in Namaqualand.

If you shall permit me a plant ecology analogy, I am reminded of how one finds it difficult to observe change in the environment if you observe it on a continuous basis. This is especially true of the desert environments. It is only once you have a lengthy reference set, or if you revisit after many years, that you can readily observe changes that have occurred. The same principle applies to you, your journey and your growth as an individual.

I remember your many endearing attributes: an inquisitive mind, your work ethic, your positive outlook on life, your most genuine concern with the lives and wellbeing of students and colleagues, your empathy, your love of helping and teaching. Your affiliation with the Scienza educational centre on campus was a natural progression given your set of traits and the circumstances. I was surprised when I learned some time ago that you had changed focus to education. My surprise probably stemming from the long road I know you had travelled in your science studies up to then. But now, having read this thesis and with the benefit of perspective that time provides, it is not all hard to see how your life's journey had taken this course to the junctures of science, education, philosophy and human development. It seems an absolutely natural fit and where you can probably make your greatest contribution to society (search for meaning). And this is probably the single goal that you value most in your professional capacity. And which your father and grandmother would have approved of.

The ontology of the child to occupy a meaningful space somewhere in society is a difficult thing to comprehend. Your views and discussion of this process is enlightening and something that I have not given much thought. Education systems seems to be necessarily systematic and rigid, most notably in the sciences, but the challenge is to maintain and even develop the individuality of the person. It is from individuality and free thought that some of the most important discoveries/revelations are made. In my own simple world view I can't help but think that the general perception prevails that responsibility for developing the individual student must inevitably diminish from the pre-school level to tertiary education level. I found the suggestion that even at post-graduate level educators have a responsibility for guiding a student to release his/her full own potential of character-specific traits thought provoking. The need to acknowledge the individual soul. Your own autoethnographic study is a very clear example of how a person continues to develop in adulthood as a continuously evolving being. I suspect if we met now after these many years, we would become acutely aware of the change perspective of time. Much like how a parched, bleak desert moonscape can give rise to fields of colour in spring…

Conrad

Letter of verisimilitude from Mrs Annatjie de Jonge

750 29th Avenue

Villieria

8 June 2018

Dear Nadine

I have read your narrative with much interest. I have to say at the outset that I learnt quite a lot about your past that I did not know about, especially when you were a child growing up in Villieria, where I am living now for the past 20 years. It was enlightening to read about your childhood days and the role that your parents and family played in your life. I knew your father back when he was the sexton of our church. What a remarkable man! I know that he would have been very proud of your accomplishments.

I also know of the hardship in completing your writing and the sacrifices you made to accomplish your goals.

It's now clear to me, why you always give me handmade cards with beautiful messages – I see how you treasured cards and messages from your friends and family and showing it with pride and joy. It was very comforting to travel with you down memory lane and see all the sentiments you stored all these years, it was also a time for me to reflect on my own youth.

I found your interviews with teachers and personnel of the primary school where you have been, very interesting. I can totally relate, as I am a primary teacher too, being in the profession through much changes and turmoil. The story about you coloring the fridge blue really hits home – this just amplifies the role and responsibilities of being a teacher in a child's formative years.

I don't see myself as a philosopher and sometimes even hate it to contemplate life and its meaning too long – too much time wasted, but it was interesting to read your reflections and material used. Weinberger's "for every fact on the internet, there is an equal and opposite fact" really is true. I try to teach my learners to keep that in mind when using "oom google" for information. I think in this informative age that the pro's and cons of technology is a subject much debated – usually between older people and the 21st century learner. I must confess, I love the technology and being able to acquire information in an instant. It's good not to be dependent on the say-so of a teacher as in the days before computers and Google, but really getting out there and explore. The remarks of teachers you've interviewed is a universal assumption – especially people who chose teaching and mentoring as a career – when teaching primary school, you invest 10% academic knowledge and

90% skills and values. It is, unfortunately, the only timeframe where you can mould a young mind to become a responsible adult.

I do apologize if I hammer on the same tune, but the extract from Fishman, you used in your research just bring it all together by saying "integrity lays the foundation of responsibility", and the wise words of Barnett: "Where the will is present, everything is present, everything is possible. Where it is absent, nothing, educationally speaking, is possible."

This just emphasize your journey in the different stages of your life as a student, and frankly most other life-long learners.

I don't think that this type of letter of verisimilitude is what you quite have in mind, but thank you for giving me the opportunity to write this letter in response to what I've read. The Buckley's story of the red flower will stay with me and will make me more aware of what I am doing while teaching young minds. I thank you for that.

Letter of verisimilitude from Prof Carin Maree

Lukasrand

Pretoria

22 June 2018

Dear Nadine,

It was a privilege for me to read your PhD thesis, especially the section on your experience as a PGCHE student. I recall many memories of our time as co-students and much of what you have written reflects my own experiences of PGCHE…

The most outstanding memories that I share with you, are the concepts of authentic learning and wholebrain learning.

Being an academic at a university and a supervisor of master's and doctoral students for the last nineteen years, I enjoyed the fresh approach of integrating your own personal life narrative with the research process to contribute to science. Though you used your own life as a foundation, you included various document analyses, interviews and literature to ensure scientifically founded and grounded evidence to describe what it means to be a student in the twenty-first century.

Your explanation of the methodology used is clear and scientific and make it possible for others to repeat it in education as well as other social / human disciplines.

Furthermore, I appreciate the acknowledgement of the person as a whole person with body, mind and spirit and how these influence learning. You were able to capture the essence of being a student in the twenty-first century in terms of being a holistic being, the search for meaning, and the importance of finding meaning for deep and purposeful learning. In your thesis you were able to highlight the importance and relevance of authenticity in learning and personal growth for finding true meaning amidst a complex modern world which is exhilarating fast due to availability of technology and Internet.

Well done on capturing the changes, challenges and opportunities occurring in education (and the world) in a very senseful manner and explaining education in the 21st century at the hand of your own life.

I wish you the best for your journey ahead!

Kind regards

Prof Carin Maree

Letter of verisimilitude from Dr Kgadi Mathabathe

5 Phyllite avenue

Zwartkop extension 8

Centurion

0157

19 June 2018

Dear Nadine,

Thanks once more for allowing me the pleasure of being a participant in your study. I believe this is a story worth telling and a much needed piece of research. Reading about your experiences as an undergraduate student in the Faculty of Natural Sciences reminded me so much of my days as a student. I read your narrative with interest and felt so inspired to read about your experiences, challenges and successes as a student. I must say, I can totally relate to your experiences of trying to survive and meet the minimum requirements for my first degree. Speaking as one who is also responsible for teaching at an institution of higher learning, I also believe that a lot can be learnt from

the experiences that you shared. Those tasked with the opportunity to teach should do so with the intention to prepare students for the real world of work and an uncertain future rather than to drive the agenda of rote learning.

I have been fortunate in that I possess the experience of both being a student and an educator at the same institution. I have seen the university evolve with time and I must say although we are not there yet I have witnessed the university take some important steps to make learning relevant and inclusive. I was interested in reading about how being in the same lecture halls brought back memories and a sense of uneasiness. I agree I would feel the same way. Having watched your narrative process unfold and the copious research you have undertaken to get it underway I believe that I am well placed to vouch for the trustworthiness thereof.

I really applaud you for opening up your life to such scrutiny through your thesis. Your narrative is a true reflection of what most students face. I could relate to your experience of doing an MSc and feeling like you were carrying out instructions based on your supervisor's ideas of a research project. I too felt that it was only with my PhD that I found my voice and truly took charge of what I was doing. I also empathise with what you went through having to juggle loss through the death of your loved ones with completing your postgraduate studies. I started my PhD studies in 2013, in 2014 I lost my brother, in 2015 I lost my mom and the worst blow was losing my dad in 2016. I will admit that it does take something out of you knowing that those who eagerly waited to see you graduate will never be there to witness it.

Your narrative is evidence of the struggles and growth pains you had to endure to get to where you are today. A product of the PGCE (Postgraduate Certificate in Education) myself I believe the merging of your academic experience from the natural sciences with the PGCHE was a perfect match to transform you into a facilitator of learning who is well-equipped to prepare learners for an unknown future and to maximise their potential. There is so much I can say from the lessons I have learnt through reading your work but I will conclude by saying that I congratulate you for finding your voice through your PhD.

Yours Sincerely,

KC Mathabathe (PhD)

Letter of verisimilitude from Mr Niel Malan

17 Third Avenue
Bronkhorstspruit
18 June 2018

Dear Nadine,

When it became clear that your PhD project was going to be autoethnographic, I must admit that I had my doubts about the value of such an approach. (I am, after all, a "hard" scientist, and like facts to be supported by numbers.) But I also realized that the scope of the problem does not readily admit itself to a figure-driven approach, and that different academic fields have different ways of validating ideas, and that numbers is only one way, so I kept my council, trusting that you were getting good advice.

Having now read large part of your thesis, I must say that I am impressed. I would not have imagined that a mere "life story" could yield such rich material for research, and that it could be treated so rigorously. I have to admit that by comparison some science is not nearly as rigorous, despite being based on "hard data".

Our friendship is closely entwined with your career at University. We met after a talk I presented to a group of school-aged children on my visit to Antarctica at the science centre where you worked as intern. (It seems that this was in 2006, and the government department was running an Antarctica Month). As usual there were a number of members of the audience who were not brave enough to ask questions during the questions session. We ended up having a long conversation after everybody else had left. From what I remember the conversation centred on relationships, and how they survive the separation of an Antarctic expedition. That a presentation about "hard science" could engender a discussion about relationships show how human-centred you are, and is probably an indication that a career in education is the right one for you.

After that first meeting I regularly ran into you, as my daily route to and from the gym took me past the front door of the science centre, and I got to know you better through a series of chats.

Although our undergraduate careers did not overlap, we had a number of lecturers and subjects in common, so reading the account of your undergraduate experiences brought back many similar memories and feelings.

In reading your story I was a bit surprised to learn that you got your first degree on the four-year programme, and that you failed some exams. Because you're such a hard worker, I'd assumed that you passed everything on first try. That you didn't is probably an indictment of the education system.

It was good fun to accompany you on your visit to the Chemistry department lecture halls and labs. To me too it was interesting to see how the physical things have barely changed, and the way of teaching not at all. (As a side note, I recently took an opportunity to teach a practical at the third-year level. The practicals had not changed since 1992, when I was a third-year student myself.)

I have long considered myself a victim of the education system, to the extent that I homeschooled myself through Matric. I had always felt quite isolated in this. Having read your story, and your slow realization (in particular your third-year botany project) that education can be a very different experience from absorbing and regurgitating information, I feel validated. A true education should generate enough enthusiasm and excitement to stimulate working long hours.

I've also had the experience that "higher education" is not necessarily higher in quality. Similar to your experience of including sub-standard material in your master's degree dissertation on advice of your supervisor, when I expressed doubts about the quality and value of a chapter in my draft master's dissertation to my supervisor, I was told to leave it in: apparently the thickness of the publication was worth more than the value of the work.

I remember spending much time with you while you were working on deciding what to do next after your master's degree. (Portuguese lessons, I remember with a smile.) I witnessed the exploitation of your willingness and energy at the hand of the geographers, and your disappointments at various PhD opportunities not realizing.

You did not choose to do a PGCHE as a default; I don't know who recommended it to you, but you should think of them with gratitude. I don't think I have ever seen somebody develop so rapidly, and so thoroughly absorb the values taught in a course of learning. I remember attending the presentation of your Entrepreneurship project.

The PGCHE course also introduced you to the person who would become your PhD supervisor. I think it does him credit that he saw the potential in you, and wished to develop it. Or perhaps I should say "exploit it".

I have no doubt that a PhD would be an appropriate part of your academic career, and as is clear from the way you blossomed when you were doing science education, a PhD in education was a good choice.

Your supervisor certainly offered you a challenging project. I see parallels with your third-year botany project: a hard question, lots of painstaking work… A life story is of course much bigger than the few pages you have available, and I think you succeeded admirably in selecting a few key episodes to represent the whole.

Including your artwork in your thesis is certainly a bold and unconventional approach, but I have to commend you on living your message: the whole being is educated, not just the intellectual side of it. Taking art classes is certainly not an integral part of the sausage-machine, three-years-done-and-dusted, copy & paste PhD our institutions want to foist on the population.

I wish I'd had the time to read your thesis in more detail, but being busy with my own PhD in Chemistry, I wrote this response only on your life story, as you asked. I am nevertheless impressed by the thoroughness and rigour that you applied throughout it.

In closing, I want to leave you with one of my favourite quotes:

> "Learning is a peculiar compound of memory, imagination, scientific habit, accurate observation, all concentrated, through a prolonged period, on the analysis of the remains of literature. The result of this sustained mental endeavour is not a book, but a man."

Mark Pattison was a university reformer, and I think you would have agreed with much of what he's had to say. I also think that he would agree with me that the mental endeavour represented by this thesis resulted in a splendid woman.

Perhaps your thesis is just another battle in a long war. But in a world that needs a new "operating system" you are fighting a good fight, and I'm happy be on the same side as such a fierce warrior.

With kind regards,

Niel Malan

Letter of verisimilitude from Ms Tracy Shaw

155 Falaise
23 Prince Street
Point
Durban
4001

30 June 2018

Dear Nadine,

Thank you for affording me the privilege of reading your PhD thesis. You have provided a vivid walk down memory lane, and your work certainly has reignited a plethora of memories which I haven't thought about for years! So interesting hearing your thoughts and experiences of being an undergraduate student, many of which I can completely relate to and recall clearly. The accuracy of your recollection is remarkable and I remember very similar feelings and events of my years on campus.

I recall meeting you in our first year, as timid BSc students. Such a tall, friendly, intelligent, and stunning young lady! I was definitely drawn to you immediately as a friend and a fellow student. I am so thankful to this day for our chance meeting on campus because it has blossomed into such a beautiful lifelong friendship! I remember feeling very intimidated attending huge classes in our first year, with hundreds of students crowded into lecture halls, and not seeing any familiar faces. This was quite a shock after the sheltered environment of high school.

Nadine has given a true reflection of what it was like being an undergraduate student. She has awoken many memories and feelings for me through her writing. I recall zoology research assignments and huge volumes of work to get through in very little time. Nadine's mention of the exchanging of notes after class ignites memories for me… I would scribble down everything the lecturer said, and often my notes were almost illegible due to the speed of writing and trying to listen simultaneously. We were always afraid of missing something. Lecturers would frequently cover topics which were not detailed in our textbooks. I would go home and type up all my notes every day so they were neat and easy to study from. I gladly shared notes with whoever needed them, and we helped each other a lot as fellow students.

Nadine and I struggled through many long classes, practical sessions, assignments, tests, and exams together. I remember the particular instance that Nadine mentioned about sitting in a zoology practical session, collecting weevils from maize kernels. It was so tedious. Group members would often get frustrated with one another and these practical tasks seemed so pointless sometimes. We had the odd outdoor practical session for Zoology, which was much more enlightening and actually had some purpose. I too failed Chemistry in my first year, and it was very disheartening. The sheer volume of work and pace of lectures was just impossible to keep up with. I completely agree with Nadine's feelings on this subject. Parrot learning everything by heart and feeling terrified and frustrated as one could not understand concepts or keep up with the quantity of work covered, and the horribly confusing practical sessions… Chemistry was the cause of a huge amount of stress and despondency for many of us during our undergraduate years.

In the later years, when we parted ways into our different specialised fields of study, I recall our coffee and cake catch up therapy sessions on campus, which were most helpful in offloading our worries and stresses! Those times together and quick campus cappuccinos kept us sane! Nadine became a very close friend of mine and helped me through some tough times at university. She was a great support and definitely brightened up my campus days! This remarkable young lady experienced a huge amount of hardship throughout her university career, but despite all this, I believe she came out stronger and more driven than she ever could have imagined herself. Nadine has overcome numerous challenges, and has put her heart and soul into her studies, so much passion and dedication she has devoted to following her dreams.

I can certainly attest to the huge amount of effort that Nadine has put into this thesis, the countless late nights, the anxiety and stress of meeting deadlines, the blood, sweat and tears, the endless hours spent dedicated to getting this mammoth task done… Nadine has truly given this thesis her absolute all and I feel so proud to read her work and share in her memories.

Best wishes for the successful completion of your PhD, you deserve it!

Kind regards

Tracy Shaw

Registrar at South African Association for Marine Biological Research

MSc Zoology

APPENDIX H: REFERENCES

Ackoff, R. & Greenberg, D.J. 2008. *Turning learning right side up: putting education back on track*. Upper Saddle River: Wharton School.

Alexander, T. & Potter, J. 2005. *Education for a change: transforming the way we teach our children*. New York: Routledge Falmer.

Banajeree, R. 2014. Two sides of the same coin: the employment crisis and the education crisis. *Forbes Magazine*. 3 March 2014. Available: http://www.forbes.com/sites/ashoka/2014/03/04/two-sides-of-the-same-coin-the-employment-crisis-and-the-education-crisis/ [2014, August 30].

Barbezat, D.P. & Bush, M. 2014. *Contemplative practices in higher education: powerful methods to transform teaching and learning*. San Francisco: Jossey-Bass.

Barnett, R. 2004. Learning for an unknown future. *Higher Education Research & Development*. 23(3):247-260. DOI: 10.1080/0729436042000235382.

Barnett, R. 2007. *A will to learn: being a student in the age of uncertainty*. Maidenhead: McGraw-Hill Open University Press.

Barnett, R. 2013. *Imagining the university*. London & New York: Routledge.

Bhikkhu, B. 1980. *Anapanasati: mindfulness of breathing*. Translated by Bhikkhu Nagasena. Bangkok: Sublime Life Mission. Available: http://www.buddhanet.net/pdf_file/anapanasati.pdf [2014, February 2].

Boeije, H. 2010. *Analysis in Qualitative Research*. London: Sage.

Bohm, D. 1980. *Wholeness and the implicate order*. London and New York: ARK Paperbacks.

Carr, N. 2008. *Is Google making us stupid? What the internet is doing to our brains.* Available: https://www.theatlantic.com/magazine/archive/2008/07/is-google-making-us-stupid/306868/ [2014, September 8].

Carr, N. 2010. *The shallows: how the internet is changing the way we think, read and remember*. London: Atlantic Books.

Charmaz, K. 2014. Constructing grounded theory. Thousand Oaks, CA: Sage.

Claxton, G. 1999. *Wise up: the challenge of lifelong learning*. London: Bloomsbury.

Claxton, G. 2012. Virtues of uncertainty. *AEON Magazine*, 17 September 2012. Available: http://aeon.co/magazine/being-human/guy-glaxton-education-morality-character/ [2014, May 6].

Colvin, G. 2015. Humans are underrated: The three skills you need to thrive in the new workplace. *FORTUNE.COM*. 10:34-43.

Covey, S.R. 2004. *The 7 habits of highly effective people: powerful lessons in personal change*. Great Britain: Simon & Schuster.

Covey, S.R. 2006. *The 8th habit: from effectives to greatness*. New York: Simon & Schuster.

Dalai Lama & Cutler, H.C. 2009. *The art of happiness: a handbook for living*. London: Hodder & Stoughton.

Dalai Lama. 2012. *The universe in a single atom: how science and spirituality can serve our world*. London: Abacus.

Damasio, A. 1999. *The feeling of what happens: body and emotion in the making of consciousness*. New York: Harcourt.

Davenport, T.H. & Prusack, L. 2000. *Working knowledge: how organisations manage what they know*. Boston: Harvard Business School.

Delbanco, A. 2000. *The real American dream: a meditation on hope*. Cambridge: Harvard University.

De Quincey, C. 2005. *Radical knowing: understanding consciousness through relationship*. Rochester: Park Street.

Dewey, J. 1897. My pedagogic creed. *School Journal*, 54:77-80.

Dimitrov, V. & Wilson, S. 2002a. Fuzziology and lifelong learning. In *Fuzzy logic: a framework for the new millennium*. V. Dimitrov & V. Korotkich, Eds. Heidelberg: Physica-Verlag. 45-53.

Dimitrov, V. & Wilson, S. 2002b. *Fuzziology and lifelong learning*. Richmond: School of Social Ecology and Lifelong Learning, University of Western Sydney. Available: http://www.zulenet.com/see/FuzziologyandLL.html [2014, June 18].

Dimitrov, V. 2003. Fuzziology: a study of human knowing and being. *Kybernetes*. 32(4):491-510. DOI: 10.1108/03684920310463894.

Doidge, N. 2008. *The brain that changes itself: stories of personal triumph from the frontiers of brain science*. London: Penguin.

Drucker, P. 2000. Managing knowledge means managing oneself. *Leader to Leader*. 16(2):8-10.

Economist Group. 2016. March of the machines. *The Economist*. 25 June. Available: https://www.economist.com/news/leaders/21701119-what-history-tells-us-about- future-artificial-intelligenceand-how-society-should [2016, September 29].

Escudero, J.A. 2014. Heidegger on selfhood. *American International Journal of Contemporary Research.* 4(2):6-17. Available: http://www.aijcrnet.com/journals/Vol_4_No_2_February_2014/2.pdf [2017, November 8].

Esping, A. 2010. Autoethnography and existentialism: the conceptual contributions of Viktor Frankl. *Journal of Phenomenological Psychology*. 41:201–215. Available: http://booksandjournals.brillonline.com/content/journals/10.1163/156916210x532126 [2018, March 25].

Fishman, T. Ed. 2014. *The fundamental values for academic integrity*. 2nd ed. Clemson University: International Centre for Academic Integrity. Available: http://www.academicintegrity.org/icai/assets/revised_fv_2014.pdf [2013, March 2].

Frankl, V. E. 1946. *Man's search for meaning*. New York: Pocket Books.

Frankl, V.E. 2008. *Man's search for meaning: the classic tribute to hope from the Holocaust*. 7th ed. Translated by Ilse Lasch. Clays: Rider.

Frankl, V.E. 2011. *Man's search for ultimate meaning*. 4th ed. Croydon: Rider.

Frankl, V.E. 2014. *The will to meaning: foundations and applications of logotherapy*. Exp 3rd ed. New York: PLUME.

Gardner, H. 2008a. *Five minds for the future*. Boston: Harvard Business School.

Gardner, H. 2008b. *Five minds for the future* [Address at the worldwide launch of his book with the same title]. Geneve: Ecolint Meeting. (Unpublished). Available: https://howardgardner01.files.wordpress.com/2012/06/five-minds-for-the-future- january-20081.pdf [2014, August 15].

Goleman, G. 1995. *Emotional intelligence: why it can matter more than IQ*. New York: Bantam Books.

Goleman, G. 2004. *Emotional intelligence & working with emotional intelligence*. London: Bloomsbury.

Greenfield, S.2014. *Mind change: how digital technologies are leaving their mark on our brains.* London: Rider.

Grulke, W. 2000. *Ten lessons from the future: 21st century impact on business, individuals and investors*. Parklands: Once Communications.

Hall, E.T. 1976. *Beyond culture*. New York: Anchor.

Hanh, T.N. 2008. *The miracle of mindfulness: the classic guide to meditation by the world's most revered master*. Boston: Beacon.

Hawken, P. 2009. Paul Hawken's commencement address to the class of 2009. *Common Dreams*. Available: https://www.commondreams.org/views/2009/05/23/paul-hawkens-commencement-address-class-2009 [2013, September 16].

Heidegger, M. 1927. *Sein und Zeit (Being and Time).* Halle: Max Niemeyer.

Heidegger, M. 1962. *Being and time*. Translated by John Macquarrie and Edward Robinson. New York: Harper & Row.

Heidegger, M. 1968. *What is called thinking*. New York: Harper & Row.

Huddleston, B. 2013. *The dark side of technology.* Charlottesville (VA): Brad Huddleston Ministries.

Huddleston, B. 2016. *Digital Cocaine: a journey toward iBalance*. Vereeniging: Christian Art.

Institute for American Values. 2003. *Hardwired to connect: the new scientific case for authoritative communities.* (Report from the Commission of Children at Risk, USA). Available: http://americanvalues.org/catalog/pdfs/hwexsumm.pdf [2014, August 8].

Jaworski, J. 2011. *Synchronicity: the inner path of leadership*. 2nd ed. San Francisco: Berret-Koehler.

Kabat-Zinn, J. 2013a. *Mindfulness in education* [Video file]. Available: https://www.youtube.com/watch=fWPLr225CRI [2014, June 2].

Kabat-Zinn, J. 2013b. *Wherever you go, there you are: mindfulness meditation in everyday life*. New York: Hyperion.

Kabat-Zinn, J., Davidson, R.J. & Houshmand, Z. Eds. 2011. *The mind's own physician: a scientific dialogue with the Dalai Lama on the healing power of meditation*. Oakland: New Harbinger.

Kahneman, D. 2012. *Thinking, fast and slow*. Clays: Penguin.

Kurzweil, R. 2000. *The age of spiritual machines, when computers exceed human intelligence*. New York: Penguin.

Kurzweil, R. 2005. *The singularity is near: when humans transcend biology*. New York: Viking. Available at: http://stargate.inf.elte.hu/~seci/fun/Kurzweil,%20Ray%20-%20Singularity%20Is%20Near,%20The%20%28hardback%20ed%29%20%5Bv1.3%5D.pdf [2015, March 20].

Leonard, G. & Murphy, M. 1995. *The life we are given: a long-term program for realizing the potential of body, mind, heart and soul*. New York: Tarcher/Putnam.

Magrini, J. 2011. Recovering the ontological understanding of the human being as learner. *Inquiry in Education*. 2(2):Article 5. Available: http://digitalcommons.nl.edu/cgi/viewcontent.cgi?article=1049&context=ie [2013, September 25].

Max, D.T. 2017. Beyond Human. National Geographic. 231(4):40-63.

Mitra, S. 2005. Self organising systems for mass computer literacy: findings from the 'hole in the wall' experiments. *International Journal of Developmental Issues*. 4(1):71-81. DOI: 10.1108/eb045849.

Mitra, S. 2012. *Beyond the hole in the wall: discover the power of self-organized learning*. (Kindle Single). New York: TED Books.

Mitra, S. & Dangwal, R. 2010. Limits to self-organising systems of learning – the Kalikuppam experiment. *British Journal of Educational Technology*. 41(5):672-688. DOI: 10.1111/j.1467-8535.2010.01077.x.

Mitra, S., Dangwal, R., Chatterjee, S., Jha, S., Bisht, R.S. & Kapur, P. 2005. Acquisition of computing literacy on shared public computers: children and the "hole in the wall". *Australian Journal of Educational Technology*. 21(3):407-426. DOI: 10.14742/ajet.1328.

Newman, F.M., Marks, H.M. & Gamoran, A. 1995. Authentic pedagogy: standards that boost student performance. *Issues in Restructuring Schools.* Report no. 8. Madison: Center on Organization and Restructuring of Schools.

Palmer, P. J. 1994. *To know as we are known: education as a spiritual journey* [Adobe Digital Editions]. HarperCollins e-books. Available: https://play.google.com/books/reader?id=vKz9rb7DBD8C&pg=GBS.PP1.w.1.0.0 [2014, March 20].

Palmer, P.J. 1998. *The courage to teach: exploring the inner landscape of a teacher's life*. San Francisco: Jossey-Bass.

Peck, M.S. 1978. *The road less travelled: a new psychology of love, traditional values, and spiritual growth*. New York: Simon & Schuster.

Piaget, J. 1952. *The child's conception of number*. London: Routledge & Kegan Paul. (Original work published 1941).

Pink, D.H. 2006. *A whole new mind: why right-brainers will rule the future*. New York: Riverhead Books.

Plutchik, R. 2001. The nature of emotions. *American Scientist*. 89:344-350. Available: http://www.emotionalcompetency.com/papers/plutchiknatureofemotions%202001.pdf [2017, February 10].

Ralston, P. 2010. *The book of not knowing: exploring the true nature of self, mind and consciousness*. San Francisco: North Atlantic Books.

Rand, A. 1964. *For the new intellectual: the philosophy of Ayn Rand*. New York: American New Library.

Ray, M. 1999. *Community building as metaphor for a worldwide paradigm shift*. Available: http://www.visionnest.com/cbw/Metaphor.html [2013, October 15].

Rinzler, L. 2012. *The Buddha walks into a bar: a guide to life for a new generation*. Boston: Shambhala.

Rowson, J., Young, J., Spencer, N., Lindley, E. & Gecius, E. 2012. *The power of curiosity: how linking inquisitiveness to innovation could help to address our energy needs*. London: RSA Projects.

Saldaña, J. 2016. *The coding manual for qualitative researchers* [Adobe Digital Editions]. 3rd ed. Thousand Oaks: Sage. Available: https://play.google.com/books/reader?id=ZhxiCgAAQBAJ&pg=GBS.PR10 [2016, April 18].

Scott, D.K. 2002. Spirituality in an integrative age. In *Education as transformation: religious pluralism, spirituality, and a new vision for higher education in America*. V.H. Kazanjian & P.L. Laurence, Eds. 2nd ed. New York: Peter Lang. 23-36.

Slabbert, J.A., De Kock, D.M. & Hattingh, A. 2009. *The brave 'new' world of education: creating a unique professionalism*. Cape Town: Juta and Company.

Slattery, P. 2006. *Curriculum development in the postmodern era*. 2th ed. New York: Routledge.

Smilkstein, R. 2011. *We're born to learn: using the brain's natural learning processes to create today's curriculum*. Thousand Oaks, CA: Corwin.

Summerlee, A.J.S. & Murray, J. 2008. Can universities survive the 21st century? *Forum on Public Policy: Journal of the Oxford Round Table*. Summer(2):0-10. Available: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.608.9838&rep=rep1&type=pdf [2013, May 25].

Turak, A. 2013. *Business secrets of the trappist monks: one CEO's quest for meaning and authenticity*. New York: Columbia University.

Turak, A. 2014. What every leader must know about personal development. *Forbes.* Available: https://www.forbes.com/sites/augustturak/2014/01/10/what-every-leader-must-know-about-personal-development/#3381be424ee2 [2017, January 15].

Vance, A. 2010. Merely human? That's so yesterday. *The New York Times*, 12 June 2010. Available: http://www.nytimes.com/2010/06/13/business/13sing.html?pagewanted=all [2015, May 2].

Von Glasersfeld, E. 2008. Learning as a constructive activity. *AntiMatters*. 2(3):33-49.

Weinberger, D. 2012. *Too big to know: rethinking knowledge now that the facts aren't the facts, experts are everywhere, and the smartest person in the room is the room*. New York: Basic Books.

Wheatley, M.L. 2006. *Leadership and the new science: discovering order in a chaotic world*. 3rd ed. San Francisco: Berret-Koehler.

Wright, R. 2014. *Buddhism and modern psychology* [Video lecture 1]. Available: https://class.coursera.org/psychbuddhism-001/lecture [2014, April 1].

Zajonc, A.G. 2002. Molding the self and the common cognitive sources of science and religion. In *Education as transformation: religious pluralism, spirituality, and a new vision for higher*

education in America. V.H. Kazanjian & P.L. Laurence, Eds. 2nd ed. New York: Peter Lang. 59-68.

Zohar, D. & Marshall, I. 2001. *Spiritual intelligence: the ultimate intelligence*. London: Bloomsbury.

Zull, J.E. 2011. *From brain to mind: using neuroscience to guide change in education*. Arlington: Stylus.