THE 21st CENTURY SKILL CHALLENGE:

SKILL DEVELOPMENT IN AN INCREASINGLY COMPLEX AND VOLATILE SOCIETY

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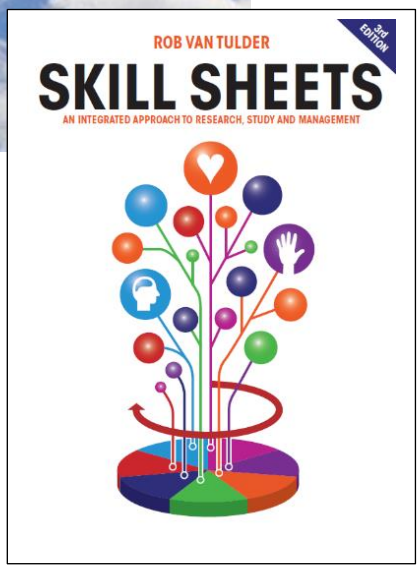

This booklet presents the basic philosophy of the Skill Sheets collection. The Skill Sheets presents an integrated formula of skill formation and training. It has been developed in co-creation with students and colleagues over a period of more than 20 years. Presently, it is adopted in a large number of universities (including applied sciences universities). The third edition, published in 2018, has added a number of basic motivational skills to the original thinking, which made it even more important to explain the basic positive philosophy of the format in more detail. This text is not included in the book, partly to limit the number of pages, partly because this exposes will probably primarily be read by teachers and educational scholars. There are references in this booklet to specific skill sheets, indicated by an arrow and a sheet (for example: → B1). Tutors and education scholars are also invited to give their thoughts and enter into a conversation and the best way to develop so-called '21st Century Skills' that combine 'head-heart-hands' in a creative and productive manner. The text is free for reproduction. The whole Skill sheets formula is in principle open source and open access.

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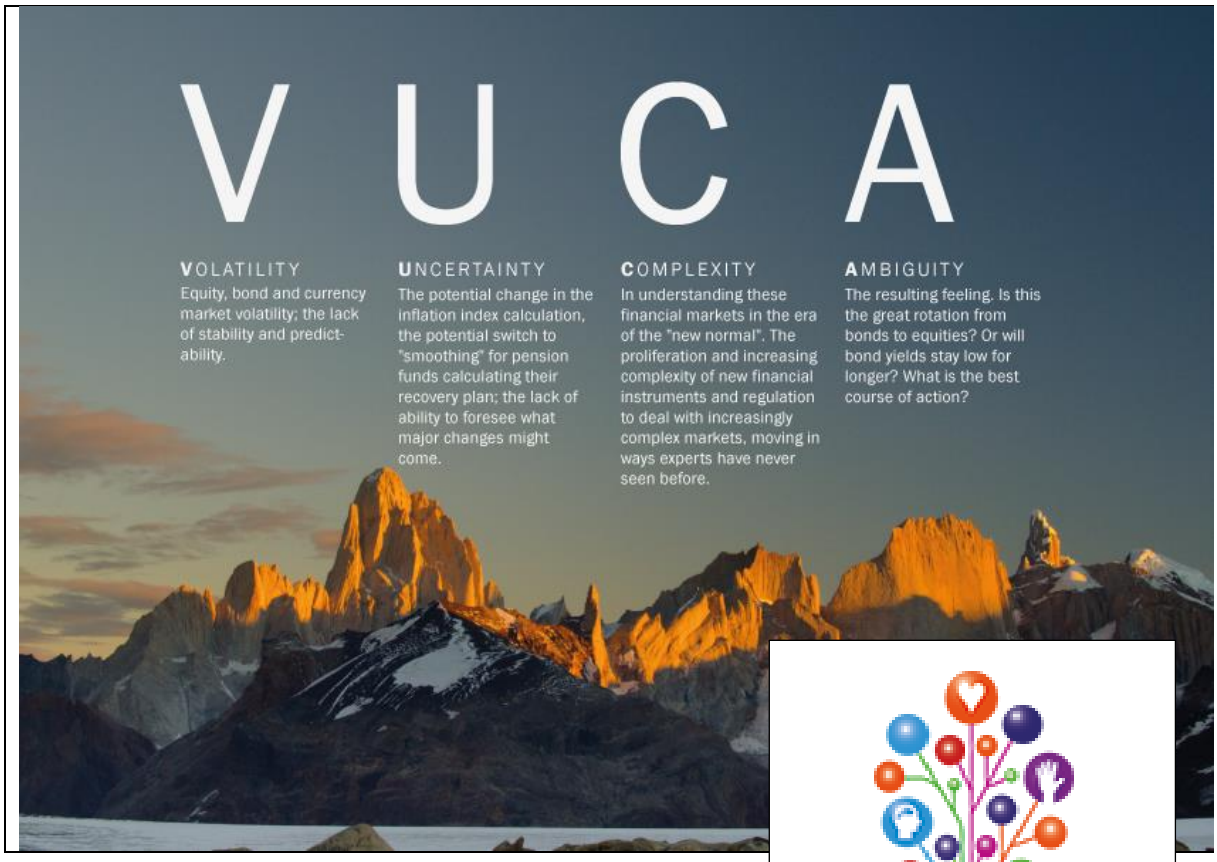
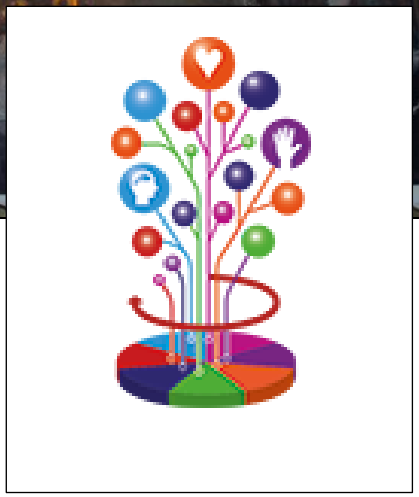




I. Introduction - the urgent need for integrated skill development in a VUCA world

We are living in a so-called 'VUCA world'. This acronym was introduced by the US military to cover for the increased Volatility, Uncertainty, Complexity and Ambiguity that technological, political and economic processes create at the moment. Under the influence of the so-called 'fourth industrial revolution' the world has become increasingly multilateral and is moving in relatively unpredictable directions. A VUCA world seriously hampers the way organizations and people can make decisions, plan forward, manage risks and foster change – which gets even worse if people want to adopt a more longer term perspective for instance by taking up the 'grand challenges' of today such as climate change, poverty, health issues or globalization. It is more important to develop general (or meta-) skills than to focus on specific – instrumental – skills related to specific job profiles or practical competencies such as presentation, writing, or reading.

In 2016, the World Economic Forum assessed that by the year 2020, one third of skills (35%) that are considered important in today's workforce will have changed. Some jobs – under the influence of advanced robotics, advanced materials, biotechnology – will disappear, others will grow and jobs that don't' exist today will become commonplace. The WEF asked human resources and strategy officers from leading global employers for instance what skill requirements will become by the year 2020 (Table 1).

Table 1 Changing Skill ambitions: top 10 skills to thrive in the 4th industrial revolution

In 2015	In 2020
1. Complex problem Solving	1. Complex problem solving
2. Coordination with others	2. Critical thinking
3. People Management	3. Creativity
4. Critical thinking	4. People management
5. Negotiation	5. Coordinating with others
6. Quality control	6. Emotional intelligence
7. Service orientation	7. Judgment and decision making
8. Judgment and decision making	8. Service orientation
9. Active listening	9. Negotiation
10. Creativity	10. Cognitive flexibility

Source: WEF, 2016

Skill priorities show some form of continuity and interrelation. Complex problem solving, critical thinking and creativity score consistently high over time. In recognition of the new nature of jobs, however, also more collective skills like people management, coordination and negotiation skills have become more important. In support of these qualities, we can see furthermore that emotional intelligence, cognitive flexibility, service

orientation and judgment and decision making – more than more instrumental skills like quality control or active listening - are amongst the top 10 skill for thriving in this rapidly changing (VUCA) society.

At teaching institutes, this trend is further acknowledged in the demand for so-called '21st Century skills". They include a number of '**foundational literacy core skills**' such as numerical-, scientific-, ICT-, financial-, cultural- and civic literacy, But they in particular include a number of competencies and qualities that are related to how students approach **complex challenges** (through critical thinking/problem solving; creativity; communication and collaboration) and a changing environment (through curiosity, initiative, persistence, adaptability, leadership and social and cultural awareness). Each country and region in the world reiterates different parts of this agenda.

In the Netherlands, for instance, 21st century skill were further specified along five skill development lines[1]: (1) the skill to **collaborate**; (2) the skill to **construct knowledge** (research, analysis, synthesis, evaluation and interpretation of other knowledge); (3) skill to **apply ICT** (for instance the use of computer to research complex problems); (4) **problem solving abilities and creativity** (applied to real-life problems); (5) **self-control** and planning in acquiring new skills (aided by quality assurance, self-evaluation and reflection processes).

The European Commission launched a New Skills Agenda for Europe, that makes a distinction between four clusters of skills that can change over time in terms of competences and qualifications (levels of mastery): (1) **basic skills** (including literacy, numeracy, foreign languages and digital skills); (2) T**ransversal skills**, such as the ability to learn and take initiative, to work with others and solve problems, will help people deal with today's varied and unpredictable career paths; (3) **entrepreneurial skills**, knowledge and attitudes will help contribute to employability, support new business creation and benefit individuals and society on the whole. (4) **Digital skills**, are required in all three areas.

Whatever the specific take on the skill challenge: all presented lists stress the importance of a learning mind-set and a willingness to intelligently spent time on the development of more generic (meta-) skills than a proven talent or ability for (mindlessly) training specific skills. Hardly any of the top-tier skills are instrumental – or can be trained in dedicated skills tracks. It is not really sensible for instance to engage in specialised 'presentation' and/or 'writing' skills classes, if this is not related to 'solving problems', 'grasping complexity' or 'developing leadership' skills.

[1] http://www.21stcenturyskills.nl/modellen (visited 27-8-2017)

Two key challenges for effective 21st Century Skill development:

1) skill development need to be **linked to real existing (often complex) problems** and …
(2) relevant skills need to be acquired and trained in **interaction** with each other.

Luckily, relevant skills can be obtained by anybody willing to understand and invest in an integrated approach to skill development. With abundant access to learning modules, supportive tools and the like around the world, skill development requires more than ever, especially *awareness of the basics and an attitude willing to acquire skills*, rather than lengthy practice sessions of specialised learning. This is the approach proposed by the Skill Sheets (Van Tulder, 2018a). This booklet – or long essay - discusses some of the most relevant insights coming from leading thinkers on the nature of societal change. How to assess major – multi-layered - trends in society: as an opportunity or a threat? Often positive and negative developments appear at the same time. Sometimes they are related. How to deal with them in a skilful and responsible manner? This booklet discusses the consequences for skill development for students as well as practitioners. It explains why the university and other institutes of higher education can still be considered the best environment for sophisticated 21st century skill development. But there a big proviso has to be formulated: this learning environment is not be 'consumed', it requires involvement and co-creation skills of everyone involved. 21st century skill development are a joint responsibility – now more than ever.

II. Five Challenges for developing 21st Century Skills

The effective development of 21st century skills in an increasingly volatile, ambiguous and complex (VUCA) world involves five dimensions of knowledge and intelligence application, creation and accumulation:

- Relevant knowledge
- Reliable (principled) knowledge
- Timely knowledge
- Shared knowledge
- Purposeful knowledge

A VUCA creates opportunities as well as threats on each of these accounts. Consequently, five challenges need to be addressed at the same time. They all are related to different expressions of the VUCA society. Some of these expressions are more positive than others. None of them can be ignored.

II.1 Relevance

A VUCA world creates in particular a challenge for complex problems solving skills. What type of complexity are we actually looking at? What is at stake? Already in the 1990s, authors started to realise that a so-called 'networked knowledge society' was rapidly coming of age (cf. Castells, 1996). Instead of hierarchical communities, relatively open communities increasingly interact with each other. The access to knowledge is increasing, partly due to the spread of the Internet, but also due to the breaking down of ideologies and other shared values. Communities of peers pragmatically get together to interactively produce joint knowledge. This trend is best exemplified by the Wiki-phenomenon in which an open community of often unregistered participants – aided by collaborative software and the Internet – generate knowledge through quickly adding, removing and editing content. 'Wiki' in principle means 'able to be edited quickly'. In some instances, quick and open Wiki networks have already provided better and more accessible knowledge results than the slower networks of closed communities dominated, for instance, by scientific peers. The networking society has multiple centres for power and decision-making, which also makes it more difficult to change its course once it takes the wrong route. The declining number of shared values can lead to the disintegration of societies that were built on these values, with nothing replacing them (cf. Etzioni, 1998). The power vacuum produces an institutional void, in which the lack of common rules and practices can also lead to chaos (cf. Van Tulder, with Van der Zwart, 2006). In economic terms, the wiki-society got organised as a 'shared-economy' or the 'we-economy', which emphasizes decentralized collaboration as much as competition. But sharing, also implies exclusion of those groups that are not allowed to participate.

If quick and open becomes more pervasive, it could also jeopardize the

creation of more thorough and deep knowledge, which sometimes requires closed networks of dedicated and committed peers that engage in dialogue to develop knowledge. Wikipedia as the most advanced global application of the Wiki-principle has been criticized for being susceptible to manipulation and electronic vandalism. Cornell University, confronted with comparable developments, even instituted a taskforce to enhance 'wisdom in the age of information'. Another term used for the effects of abundant information is 'infobesitas' which leads to people facing increased choice stress. Or in the words of Mega Trend watcher John Naisbit (1984): "we are drowning in information, but starved for knowledge."

- **Relevance**: the first challenge of the VUCA society is to increase the reliability and relevance of open knowledge exchange, without losing flexibility. Open knowledge exchange requires high skill levels to wisely use the abundance of knowledge, and to access and produce *relevant* knowledge. In the internet age, this obviously requires a high level of 'data literacy'.

II.2 Reliability

Networking changes the traditional selection criteria for identifying the quality and the relevance of knowledge. Absolute quality is becoming less relevant than relative quality. This is also due to the absence of a mutually accepted authority that can define absolute quality standards. Increasingly, benchmarking and rankings are used to distinguish 'best-practices' and help individual participants specify their own rules of engagement. A 'rating economy' matures in which people start to rate hotels, restaurants, products, but also governments and companies. The rational argument is that the 'wisdom of the crowd' provides higher quality information than the opinion of a single expert. The more intuitive argument is that you trust the opinion of your fellow group more than of independent expert even if they have a high scientific prestige. The bubble economy reinforces this trend (see below).

But who is defining the 'best-practice' and who compiles the rankings and ratings? It has been shown that the more independent ranking agencies

produce more reliable knowledge. At the same time 'peer reviews' act as an increasingly important mechanism through which information and influence is regulated. In media, accountancy, the medical and legal trades, science in general, even in regards to entire countries, peer reviews are considered the only feasible way to come to judgements. But how independent are those peers and who defines who the peers are? Networks of peers often constitute rather closed communities, which in turn limit the trend towards openness.

There is, consequently, a constant quest for producing ratios, rankings, and exact measures. What counts is what you can measure, and in the present society that also applies to the unmeasurable. The resulting 'numeracy society' creates another problem – that of an increasing number of innumerate people. Innumeracy is the 'inability or unwillingness to understand basic mathematical ideas involving numbers of logic as they apply in everyday life' (Dewdney, 1993). It is the mathematical parallel of illiteracy. In networking processes, actors (companies, governments, special-interest groups, the media) increasingly use mathematics – in numbers, surveys, percentages – to sell their ideas and products. But use can easily turn into abuse, as actors exploit the innumeracy of their audience by twisting logic and distorting numbers (ibid:2).

In this search for 'facts' and measures, however, science is becoming yet 'another opinion'. Experts therefore susceptible to low levels of trust. This trend has become further reinforced from within science, where an increasing number of scientific disciplines found considerable flaws in the robustness of their theories and empirical findings. This problem applied to the more 'softer' social sciences like psychology, but also to more 'hard sciences' like biomedical research. Sometimes up to 50% of published findings could not be reproduced or validated. Science is a human activity. These developments point at serious flaws in the organization of science – in double blind review procedures, ranking of journals, funding of research – but also in the kind of knowledge that is sought after – with a bias in favor of quantifiable knowledge. The organization of science itself has become part of the complexity problem that require a high level of skills (Science, 2015).

These developments feed into two other societal trends: the 'Post-Truth society' and the 'bubble society'. Post-truths policies relies on feelings, not facts. Since 2017, the Trump administration in the United States has become the leading, but certainly not the only, exponent of this trend. Post-truth politics create 'alternative facts' that are not intended to convince people but to reinforce prejudices (The Economist, September 10th 2016). This trend is pervasive, not only as part of new forms of politics and an exponent of 'low trust' societies in which science has also become under pressure.

- **Reliability:** The second challenge of the VUCA society is to produce high quality and relevant knowledge on the basis of peer review and benchmarking. It requires high skill levels to identify, select and reproduce *reliable* knowledge. To distinguish 'fake news' from 'real news' and 'facts' from 'fables'. It also requires the ability to work together in teams, learn how to learn and apply persuasion and influencing skills in an ethical manner and to deal with biases.

II.3 Timeliness and dynamics

Modern society can empower skilful participants. But as a societal model, it seems to come at a considerable price. Knowledge creation and diffusion is basically a slow process. There seems to be less time available for slow progress. Under the constant pressure of media, people are often stimulated to put more emphasis on timely information than on relevant information. The concept of a 'deadline society' is another expression of this phenomenon: relevant knowledge is only what can be produced within the deadline. In a deadline society, 'being right' is less important than being proved right by your peers. This leaves tremendous room open for so-called 'pseudo-intellectuals' and the rule of the 'mediacracy' – when appearances are more important than reality. The spread of pseudo-intellectualism is a sign of intellectual sloppiness. One of the mechanisms through which pseudo-intellectualism operates is through easy abstractions and superficial judgements (Barzun, 2002). 'Mediacracy' sounds remarkably similar to 'mediocracy' (or 'mediacrazy').

Instead of collaboration and dialogue, society becomes governed by the principles of a 'debate society', in which sound bites and smart one-liners are more important than solid argumentation. Culture historian Herman Pleij complained that students nowadays 'can do many things, but don't know anything anymore'. At the same time this spurs a high degree of negativity, criticism and cynicism. This trend is based on a fundamental human trait, i.e. that people tend to remember four negative memories for every positive one (Roberts et al., 2005). This makes distant and negative commenting easier than committed and positive feedback. The mediacracy

is further fed by these tendencies. Research comparing the contents of British media over time, found that the ratio of negative versus positive articles moved from 3:1 in 1974 to 18:1 in 2001 (Guardian Media Supplement Survey, 2005). Based on these figures the present society can also be labelled as a 'cynical society'.

Consequently, the level of opportunism in societal interactions increases. Enter the idea of a 'low-trust' society (Troman, 2000). The intensification of mutual relationships leads to calculating behavior in which participants – in case they still want to get it right – want to do this with preferably the least amount of effort. Often, this is easier to obtain in a closely-knit network of people, which further precipitates the concept of a 'knitting society' in which it proves easier to network than it is to work. Sociologist Kees Schuyt refers to this phenomenon as the 'multi-individual society' in which everybody negotiates with everybody else, but on the basis of bleak convictions. MIT professor Sherry Turkle (2011) points to the development that people expect more from technology (in particular social media) and less from direct interactions. She calls this trend 'alone together', the abundance of communication between people that is accompanied by a lack of contact. This is typical of a high-tech society in which the identity (the self) is fragile and linked to technological networks. The adage becomes 'I share so I exist'. In a society in which convictions become bleak and personal contact superficial, strategic behavior – that can involve misrepresenting one's preferences in order to vote against the least preferred outcome – prevails. The flipside of the debate society is therefore what sociologist Henk Becker has called the 'protestocracy'. Societal actors have to speak up in order to be heard, or to be allowed to participate at one of the (manifold) bargaining tables where decisions are made. When faced with negative consequences of specific measures, you have to share the protests, or risk being hit twice as hard. It leads to interactions that are largely guided by tactical and short-term considerations.

The 'low-trust' society gives room to a 'second-opinion' society. Basically, the search for second opinions highlights the growing assertiveness and research orientation of people that acknowledges that there can be more sides to an issue or a problem if the quality levels are not established objectively. Second opinions can lead to more informed choices. However, in practice the 'second-opinion' society also leads people to search for a second opinion if they do not like the first opinion they get – no matter the quality. The principle of *competitive bidding* increasingly applies to participants of the bargaining society even in the private realm of personal health (sometimes with devastating effects for the individual involved). As a consequence, quackery and charlatanism are on the rebound in many societies. The 'scientific method' (of proving what you claim to be true or relevant) is put under pressure.

This trend is accompanied and partly reinforced by the bubble economy and the mediacracy, in which people organize themselves in (social)

networks of like-minded members. Social media networks like Facebook and twitter reinforce this trends. Commercial networks like Amazon or search engines like Google do the same, by applying specific algorithms people's preferences are filtered; but they don't decide what gets in or don't see what gets edited out (Pariser, 2011). This is a highly selective process. Research on the filtering effects of Facebook, for instance, shows that in five years' time Facebook users become more myopic in using specific sources of news: after a while they only select – or get selected by Facebooks algorithm – those news items that exactly fit their world view. This selection bias becomes stronger, the more active people use the social network (cf. Volkskrant, 11 March 2017). The leading internet corporations create a 'platform economy' in which a relatively limited number of companies dominate networks, create new offerings (such as Airbnb or Uber) but also require new form of regulation.

- **Timely organized**: the third challenge entails in particular organizing and producing relevant and reliable (controllable or auditable) knowledge for specific audiences. It requires high skill levels to produce (often together with others) *timely* knowledge with sufficient independence and openness towards new insights, as well as the ability to effectively and modestly communicate about the results.

II.4 Sharing – outcome

What is the outcome of all of the above parallel developments? Two societal concepts are relevant in this respect: the risk society and the hyperkinetic society. Ulrich Beck first coined the term 'risk society' in 1992. He focussed on competing scientific and political ways in the management of the increasing risks associated with modern society. Modern risks are 'manufactured' and much more the result of human activity than in the past. The operation of the risk society contains a boomerang effect, in that individuals will also increasingly be exposed to these risks. But the distribution of the causes and consequences of risk can be unequal. In the view of Beck, the unequal distribution of risk is fundamentally dependent on the knowledge and access to information of individuals. This brings us back to the previously mentioned skill challenges. To what extent can

individuals become aware of the threats and opportunities of the risk society? Here the challenge can become very personal.

The present risk society has also manufactured a 'hyperkinetic society' (cf. Hallowell, 2005) in which fast thinking is more important than deep thinking. The demands on time and attention of the human brain have exploded over the last two decades. Life has accelerated tremendously. According to Edward Hallowell (2005), the human mind is filled with noise, and the brain gradually loses its capacity to fully and thoroughly do anything. Computer expert Linda Stone (1998) coined the term 'continuous partial attention' for this phenomenon. The human brain can be improved, but can also be destroyed due to societal stress, multi-tasking and loss of dedicated attention for important aspects of life. An increasing number of people complain about loss of memory and concentration. According to neurologist, Margriet Sitskoorn, these complaints are caused by a mismatch between existing skills and the demands imposed upon us by the rapidly changing environment. The cognitive brain might perfectly understand the operation of the bargaining society; the emotional brain does not (yet). As a result, even smart people tend to underperform and suffer from serious attention deficits. Only under stress can they perform. Stress stimulates the production of adrenaline, which resembles the chemicals used to treat Attention Distraction/Deficit Disorder – a neurological disease. Firms, universities, society at large ask people 'to work on multiple overlapping projects and initiatives, resulting in second-rate thinking' (Hallowell, 2005). The hyperkinetic society tends to reward those that do a lot and punish those that try to focus. The hyperkinetic society reinforces the universal human tendency to procrastinate (→B9).

A so-called 'Gig economy' is developing. It creates an environment in which temporary positions are common as are short-term engagements. Flexible work, short-term contracts and the like prevail. The problem with the gig economy is that short-termism prevails, collective learning becomes more difficult. The gig economy feeds into – and is the result of – a low trust society.

As a consequence of the coming of age of modern society in many countries, managers, students, teachers, researchers, administrators, parents, and politicians are increasingly operating in a continuous 'survival' mode. This affects the functioning of your brain, which in turn further precipitates calculating behavior. In such a society everyone has to become a calculating person to a certain extent. You can do that cleverly or not. For instance, engaging in many activities at the same time requires prioritization and management, which in turn requires clever calculation. Calculating behavior is a fact of life in a multi-faceted, rapidly changing society. It is difficult to attach negative or positive connotations *per se* to this behavior.

- **Shared intelligence:** The fourth challenge of a VUCA society entails the production of *shared and meaningful knowledge* that takes into account the outcome of societal processes, and assesses their desirability in order to come up with effective solutions. In the words of Douglas Englebrecht, key contributor to the Internet revolution, 'for coping with critical, global problems (…) a higher order of shared intelligence is essential' (quoted in *Business Week*, September 6, 2004). For an individual student this challenge implies that you are intimately aware of the positive as well as negative consequences of the hyperkinetic society for yourself, and are capable and willing to make effective use of the knowledge developed by yourself and others. This requires an integrated approach to skills, for which the skill sheet collection is intended – to give you sufficient support.

II. 5 Purposeful and Synthesized knowledge – use you heart!

Dealing with the often contradictory claims and trends in the 21st Century requires one final knowledge challenge: how to synthesize and stay focused on creating purposeful knowledge. This boils down to a fundamental understanding of your personal motivation: what triggers it and what sustains it. Making knowledge relevant implies that you link your intelligence and knowledge development to real societal issues and a strong intrinsic motivation to deal with them (see section 1). The final challenge can thus be summarized as developing purposeful knowledge and intelligence. This insight builds on a long tradition of thinking regarding skill and knowledge accumulation, but also on the position of universities in society.

Skills without motivation are void. Learning without a more basic understanding of what motivates people (as researchers, students or practitioners) is without purpose. So, skills do not only involve 'what' and 'how' questions – strongly linked to cognitive and practical skills. But effective skill development is equally dependent on 'why' and 'what for' questions, related to personal motivations and societal ambitions. This idea builds on educational thinkers like Moore (1940) or Von Humboldt (1793).

Both embrace the idea of "education of the heart". Moore argues that "without an animated, educated heart, the intellect appears superior, and we give too much attention and value to it". The result: 'many are schooled, but few are educated'. This idea resonates rather well with the original ideas of German enlightened humanist and founder of the modern university - Von Humboldt - who saw universities as places to search for 'truth'. In his treaties *Theory of Human Education* (1793: 283), he states that education needs to link to the 'concept of humanity in our own person [...] which, can only be implemented through the links established between ourselves as individuals and the world around us'. The individual is not only entitled, but also obliged, to play his part in shaping the world around him or her. The 'heart' becomes a metaphor for our humanity and attention to the wider world around (and in) us.

Purposeful skills development creates a link between scientific and societal challenges. This ambition can also be presented as a 'triangle'– also known as the 'activation trinity': how to effectively combine "head" (thinking), "heart" (passion) and "hands" (practical skills). Phrased differently: the heart relates to 'why' questions, the head adds the 'what' dimension and the hands are aimed at 'how' to make this work (Cf. Sinek, 2015). This activation trinity poses a synthesis challenge. It introduces the 'heart' dimension in traditional education and training that is often largely concentrated on rational mind-set development and practical approaches. Challenges of the 'heart' add the following dimensions to the training curriculum: what are the real problems we face; what motivates us; how can we organise our lives in a holistic, mindful and meaningful manner? Three less rational "why" questions then become equally relevant: 'why me,' 'why now' and 'why not'?

Introducing the heart in education, research and management practice, however, is not without risk. As one blogger rightfully argued: hearts in sole combination with hands can lead to 'reckless enthusiasm' (ideologies), hearts merely in combination with heads to strategies 'without legs' (no implementation), and heads solely in combination with hands to uninspired or disjointed action. It is the combination, the synthesis of head, heart and hands, that carries weight (Table 2).

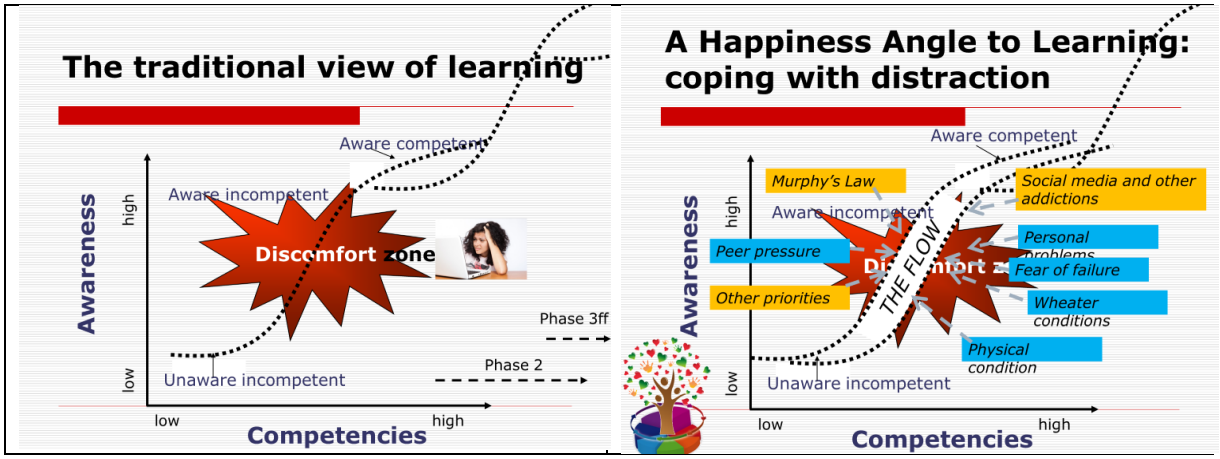
Table 2 Combining heart-head-hands?

<table>
<tr><th></th><th>Head</th><th>Heart</th><th>Hands</th></tr>
<tr><td>Basic questions</td><td>What?
Who?
Why?</td><td>Why me?
Why now?
Why not?</td><td>How?
Where?
When?</td></tr>
<tr><td rowspan="3">Ineffective combinations?</td><td>*missing*</td><td colspan="2">"Reckless enthusiasm"</td></tr>
<tr><td colspan="2">"Strategy without legs"</td><td>*missing*</td></tr>
<tr><td>"Disjointed…</td><td>*missing*</td><td>…action</td></tr>
<tr><td>Ambition</td><td colspan="3">Synthesis</td></tr>
</table>

Source: based on 'blog' consultantsmind.org [April 2014]

The cover of the third edition of the Skill Sheets (2018a) illustrates this ambition symbolically: grounded in a solid foundation of integrated skills, a robust and self-nurturing 'tree' of growing skills related to insights and passion can develop. Education with and of "the heart" provides the missing link between "hands" and "head," between practice and logic. Without this, skills training does not 'make sense'.

Motivation is key. But how can it be organized in a learning environment? Any learning experience commences with *personal awareness* (self-management) and is followed by a number of learning phases. In the first stage of learning people/children are relatively incompetent but blessed in ignorance of that particular incompetence. Learning at higher education levels always requires that they become aware of their incompetencies. So the second stage of the learning cycle often involves a period, which in learning theory is also referred to as the '*discomfort zone*'. In order to reach higher stages of competence, everybody has to deal with this period. Being in the discomfort zone, means you are acquiring new insights and new skills. People who are afraid or have difficulties in coping with this discomfort zone will start behaving in a calculated manner, put less effort in the learning cycle, which seriously limits their learning effect.



How to make learning a more gratifying experience? Instead of thinking of learning as a discomfort zone, it can be portrayed as a 'flow'. Getting in the flow is easier when people are doing something that they really like or that they find really important (linked to their heart and passion). It is even considered by experts on happiness as one of the most important characteristics of happiness. How does this work? According to positive psychologist Mihaly Czikszentmihalyi (1997) you find most pleasure and lasting satisfaction in activities that bring about a state of flow (Czikszentmihalyi, 1997). People feel most happy when working on something that consumes their attention completely. They are fully focused, oblivious to what is happening elsewhere, and time flies by. Flow is unrelated to income or intelligence (Bormans, 2012: 258). People in general

experience 'flow' when working on an interesting challenge, that is within their reach (but not too easy) and requires a considerable level of skills. Halfhearted attempts reap comparable results as calculating efforts. Activities that create a flow are intrinsically motivating and therefore valuable because they create a mood that provides a goal in itself. The flow becomes self-perpetuating. Flow enables people to blossom and function optimally. This can explain why people feel happier when they are working in areas they are passionate about (warm heart), which is relatively easy to concentrate on (inspired head) and which helps them to acquire and practice all sorts of skills (productive hands) that they might have mastered before. Happiness then goes together with hard work and consequently creates a greater feeling of achievement for more complex problems, that are, however, not too complex. People/students are working with great awareness on something that they are not (yet) competent in, precisely to become more competent. So the much feared 'discomfort zone,' in fact, potentially presents the moment of everybody's greatest happiness – as long as they can work steadily on relevant problems, and without too much disturbance. The moment of ultimate happiness then arrives when people succeed to get out of this 'zone' with a higher degree of competence and awareness.

How to sustain purposeful action in a VUCA world? We know from motivational research (Van Tulder, 2018b) that complexity breeds paralysis, that 'grand challenges' are often encountered with negative – pessimistic frames. Topics like climate change and global poverty – framed as upcoming disasters, for which there are reasonable arguments - often lead to what is called 'apocalyps fatigue'. Heads and hands are not sufficient to deal with complex issues alone. We know from motivational research, however, also that intrinsic motivation is strongly stimulated by the heart.

Luckily, the same VUCA has also brought forward a clearer focus on a common agenda: the Sustainable Development Goals (SDGs). They were introduced in September 2015, after an intense multi-stakeholder engagement strategy in which all sectors of society participated. The SDGs create a purpose for a common agenda for the year 2030. The purposes are non-ideological, pragmatic and achievable – provided all sectors of society collaborate and invest their energy. Nobody with a 'warm heart' can for instance be against alleviating poverty in all its forms (SDG1), provide access to education (SDG4), make supply chains more sustainable (SDG12) or make sure that life below water is safeguarded (SDG 14). The SDGs present a positive change agenda that thereby includes most recent insights from positive psychology. It also creates a platform for purposeful efforts of research and teaching institutes. The best flow in a learning environment can be created by linking the activation trinity to the SDGs. This can be summarized as the "synthesis challenge.

The most relevant personal dimension of this synthesis challenge actually involves different types of 'intelligence'" at the individual level. There are all sorts of theories and classifications on what constitutes 'intelligence'. Likewise there exist many tests on how to measure intelligence. One of the most obvious popular tests being the IQ test. Scores on this test measure primarily analytical intelligence and are often used as a selection tool. High IQ scores suggest 'geniality'. But IQ scores are difficult to interpret and therefore seriously debated (→ B5). In response, others have argued that emotional intelligence is equally important. Thus an EQ test was introduced. Practical intelligence (PQ), finally, has been introduced in more business-like environments and for technical professions. More and more, however, psychologists are arguing that numeral scores on either dimension present seriously flawed coverage of people's abilities. People have multiple Intelligences. Gardner (2000) for instance distinguishes eight forms. The definition of intelligence has also changed to cover the most important dimensions of intelligence in their interaction. An interesting definition in this context was introduced by Sternberg (2003). In his book 'why smart people can be so stupid', he defines individual intelligence as "mental activity directed toward purposive adaptation to, selection and shaping of, real-world environments relevant to one's life". What he portrays as 'successful intelligence' is comprised of three factors: analytical, creative and practical intelligence. The debate among psychologists is still ongoing, but a synthesis seems obvious: combined, accumulated and focused intelligence (IQ+EQ+PQ) should create *Societal* intelligence (SQ).

■ **Purposeful intelligence:** The fifth and final challenge of a VUCA society entails the development of meaningful individuals that are able to deal with all the challenges and opportunities that they face in a focused manner. This requires societal intelligence (→B1) and the ability to let heart (motivation/passion) – head (rational thinking) and hands (practical abilities) work together to create innovative solutions to present-day challenges.

II.6 Bringing it all together

Table 3 summarizes the various characterizations of modern society – which on closer scrutiny together constitute the real VUCA world – with major threats but also major opportunities. The five challenges and trends are to a large extent mutually reinforcing.

Table 3 Conflicting trends/characterizations of modern society

■ **The Network Society**	You are who you know.
■ **The Knowledge Economy**	Access to knowledge is abundant and decisive for active participation.
■ **The Wiki Society**	Quick and open is better than thorough and closed. 'I share, so I exist.'
■ **The Open Society**	Interrelated open networks create better results than closed, isolated, networks.
■ **A Peer Review Society**	Absolute quality does not exist; it is all in the eye of the beholder.
■ **The Benchmarking Society**	Doing it right is relative to the 'best-practices'.
■ **The Numeracy Society**	What counts is what you can measure, even the unmeasurable.
■ **The Deadline Society**	It is only relevant if it can be achieved within the deadline.
■ **The Pseudo-Intellectual Society**	It is not about being right but about being proved right.
■ **The Knitting Society**	It is more effective to network than to work.
■ **The Mediacracy**	What/who you appear to be is more important than what/who you are.
■ **The Calculating Society**	Getting it right is only right if it takes the least amount of effort.
■ **The Multi-Individualist Society**	Everybody opportunistically bargains with everybody else.
■ **The Low-Trust Society**	Low mutual trust in skills and integrity.
■ **A Second Opinion Society**	Two is more than one.

■ **The Debate Society**	You don't have to win a debate, but be sure not to lose it.
■ **A Protestocracy**	If you do not protest, you will be ignored (and hit twice as hard).
■ **The Cynical Society**	Commenting is more important than commitment.
■ **The Risk Society**	A society that is preoccupied with the future 'manufactures' risk and distributes it unevenly.
■ **A Bubble society**	Seemingly open, but relatively closed networks of likeminded people
■ **Rating economy**	Experts and scientists cannot be trusted; there is considerable wisdom in the crowd
■ **A Gig economy**	Short-term prevails over long-term
■ **The Hyperkinetic Society**	Fast thinking is more important than deep thinking.
■ **The Post-Truth Society**	'Alternative facts' are as relevant as 'real facts' ; facts are less important than opinion and emotions and '' fake news' becomes a point of discussion
■ **The We/sharing-Economy**	Whereas competition prevailed in the old economy, the new economy is based on collaboration and sharing
■ **A VUCA society**	Volatility, Uncertainty, Complexity and Ambiguity prevail
■ **The Digital and Platform society**	Digital networking and communication infrastructures that provide a global platform for communication, collaboration and the search of information
■ **A Goal-oriented Society**	By defining global and universal ambitions for the world (The Sustainable Development Goals), knowledge and positive energy can be pooled for a common agenda

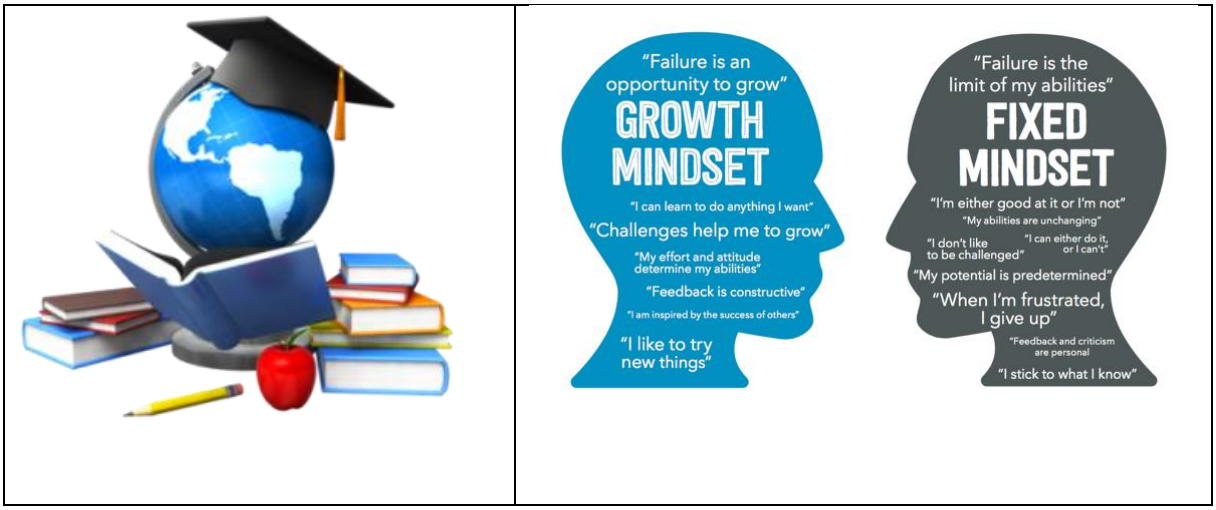
Five Skill Challenges

1 **Relevance:** wisely use the abundance of knowledge to access and produce relevant and meaningful knowledge.
2 **Reliability:** identify, select and reproduce reliable knowledge.
3 **Timeliness:** produce, together with others, timely knowledge with sufficient independence.
4 **Sharing:** produce shared and meaningful knowledge that takes the outcome of societal processes into account.
5. **Purposefulness and synthesizing**: feed your intrinsic motivation, create a flow in which you combine head-heart and hands to nurture 'societal intelligence' and focus on 'grand challenges'

How to get "activated" depends on how the learning environment is organized – by yourself and by others. Sections III and IV explain how this can be achieved in a pragmatic, realistic and responsible manner.

III. A reality check: Entering a calculating learning environment

Personally, I have come to summarise the many societal developments that were discussed in section 2, under the single heading of an **'international bargaining society'** (cf. Van Tulder with Van der Zwart, 2006). This concept abstains from any positive or negative connotations, but only recognises that a society is materialising in which more and more assertive stakeholders are willing and capable of bargaining over the rules of the game and its outcome. For society as a whole, it is not clear whether this will lead to positive or negative outcomes. Witness in particular the crisis of science as 'yet another opinion' fed a low-trust society governed by post-truth policies and room for 'alternative facts'. The VUCA world creates a bargaining society that increases the relevance of acquiring more meta-cognitive (head-hands), but also emotional (heart) skills. What does this context actually mean for students who engage in learning at a moment when they probably will make decisions (acquiring skills related to content) that will have tremendous impact on the rest of their lives? Higher education often presents a 'tipping point' in a vital time of people's lives – so-called formative years of adulthood between the age of 18 to 25 – that defines future pathways and mind-sets. . But an academic environment creates much more opportunities than a secondary school, not in the least because students have reached a more mature age and are considered to take up much more responsibility for their own learning. And they can.



At the start of any type of advanced study after secondary school, you face the challenge of a significant change in attitude. The information load you are facing is often overwhelming; you are expected to study large amounts of material in a disciplined manner, gather information yourself, work together with other students that come from different places (and cultures sometimes) and create new information. With relatively little external control or incentives from the educational institution, the

responsibility for personal development and academic achievement rests largely on the individual student. There are no laws forcing you to study, and your parents are hardly able to check whether you are doing your 'homework'. Tutors can enthuse and encourage you to study, but in the end it all comes down to your own *intrinsic motivation* and your ability to adapt to this new style of learning. Moreover, academia is less and less a place where in splendid isolation from the outside world, scientists and students can pursue 'the truth' and accumulate knowledge and skills. Academia has become part and parcel of the *international bargaining society* and researchers/teachers are under increased stress to publish (or perish) and are struggling to get their methods and theories right, while often engaged with more suspicion than in the past (see section 1).What are the implications of the (VUCA) bargaining society for the academic environment? Faculty members often find themselves caught up in a 'publish or perish' rat race and struggle with an increasing and diverse set of demands and activities. Students increasingly bargain over grades, as well as the content and work load of courses – confronted as they are with an increasing and diverse set of demands and ambitions in a complex society with a wide range of possibilities. Higher education as a public good is getting increasingly mixed up with a private mode of organising and financing. Higher education, in many countries around the world, is becoming a *hybrid* form that unites public and private – with all its opportunities, but also with all its drawbacks. By blending into the international bargaining society, academia also becomes susceptible to one of its dominant mechanisms – participants engaging in calculating behaviour and seeking to maximise output through minimum effort. The wider academic community in principle consists of the following actors: students, staff (administrators, teachers, researchers) and financiers (governments, business, parents).

Table 4 The academic community as a calculating society

Calculating…	Characteristics	Possible Consequences
Students	Only doing what is required; trying to make maximum use of any ambiguities in a programme; engaging in free-rider behavior; CV-building (extra-curricular activities are more important than actual study to distinguish and less frequent exams; yourself in the job market).	Lengthy appeal procedures; lack of time for effective studying; constant demand for lower intensity of classes and less frequent exams; plagiarism; increasing number of pseudo-intellectuals; grade-inflation.
Administrators	Kissing up, kicking down; not laying down clear rules so as to manipulate them to own advantage; not engaging in evaluation exercises; networkers.	Lack of transparency; lengthy meetings; atmosphere of mistrust; lower productivity; increased overhead expenditures.

Calculating…	Characteristics	Possible Consequences
Scientists/teachers	Refraining from engaging in small group tutoring (too much work); preference for mass lectures (highest returns per contact hour) and strict grading systems; multiple-choice exams; limited availability; scientist as a bureaucrat.	Limited commitment to students; hierarchical; rule-oriented rather than content oriented; stricter rules; lowered quality of exams; growing gap between teaching and research.
Scientists/researchers	Choosing 'easy' topics that lead to easier publications or easier funding for consulting research; use of junior researchers; free-rider on the efforts of colleagues in their own institutions; networkers in the academic community and funding organizations.	Publishing as an act of extreme pleasing of referees (or 'prostitution'; cf. Frey, 2003); 'old boys' network in research funding; (top) scientists become administrators; gap between academics (know a lot about little) and intellectuals (know something about a lot) increases.
Governments	Budgetary problems in funding universities not in the least because more people study – and they study longer; trying to 'rationalize' education, cutting back on funding of scholarships and involving private parties in funding; stricter selection or admission criteria; privatization of higher education.	Race between universities to attract additional funding; decline in cooperation in periods of rationalization; lack of funding through scholarships force students to work, often with negative consequences for their studies.
Business	Due to decreased government funding, business gets more involved as sponsors (buildings, facilities), but also as customers for research. Scholarships of firms select the 'best' students. Choice of master's studies is strongly influenced by job opportunities. Thesis topics reflect business interests.	No fundamental but only applied research is done. Interests of business become the leading research questions. Scientist becomes 'guru'. 'Market conformity' of the university triggers more calculating behavior. 'Best students' are defined from the perspective of future employers, not necessarily with reference to scientific requirements.
Parents	*Quid pro quo:* support in financing higher education as retirement scheme and way to exert control over children.	Parental affection channeled through scholarships and dependency relations; only interested in the grades and consecutive career – not in the topic.

Table 4 illustrates the various forms of calculating behaviour exhibited by these stakeholders and the possible sub-optimal consequences of this behaviour. See whether this image corresponds to your academic environment, and to what extent. It will help you to determine the extent to which you should develop a strategy to escape the negative consequences of a calculating academic community. The result of a calculating environment has been that students (as well as teachers and researchers) have a tendency to be (1) less motivated to learn, (2) less prepared to work hard, (3) try to evade complex problems and (4) have a shorter concentration and interest span for developing skills and content. This is exactly opposite to what constitute 21st Century skills! Research of the Dutch *Onderwijsinspectie* (Ministry of Education and Sciences, 2016) shows that this situation seems more problematic in the Netherlands than in other countries. The advice is to make education more meaningful, personal and more coherent. Exactly the formula that the Skill Sheets embraces.

An overly calculating environment implies high transaction costs and increases the propensity towards free-rider behavior of all involved. American philosopher Martha Nussbaum (2010) talks about the silent crisis in the educational system in this context: instead of teaching students how to think critically on complex global problems, the system focuses on instrumental skills for direct results (often business-orientated). Nussbaum's solution is education aimed at democratic citizenship and the re-establishment of 'liberal arts' as a basic training requirement at universities and high schools in an intensive and Socratic manner. This Skill Sheets collection follows Nussbaum's basic orientation. It helps you to develop your own (humanistic) competencies, even if the system does not provide optimal conditions.

One of the basic problems for individual students is that they only understand what they have missed out on during their studies long *after* graduation. Whilst the bargaining/knowledge society is also characterized by the continuous need for education and re-education, missed opportunities at university level do not easily get compensated for during your postgraduate career. The choices made at university often have a lasting impact on an individual. The lasting impact does not apply to the academic discipline chosen – there is an abundance of examples of postgraduates who established a career in a completely different area to the one they were trained for. A more lasting impact exists in terms of the skills and attitude you have developed during these extremely important formative years. Whatever attitude you develop in this period, including the social networks you become involved in, will shape your future in a more profound manner than the exact study you choose.

IV. Shaping your environment: The university (nevertheless!) as a positive learning environment

So much for the 'realistic' scenario. Luckily, a university environment should be able to make the best out of the bargaining society, provided students/participants are able and willing to effectively apply the five Skill challenges presented in section I. The university (and other institutes of higher education) can provide excellent preconditions for a continuous and virtuous learning environment as long as students realise that they are not passive consumers of these facilities, but are active **co-creators** of this learning environment. There are at least five dimensions to this issue: the staff; the library; the free haven function of the university; the peers, and the application of quality standards.

- **Outstanding and committed staff**: Universities make it their business to attract the best intellectual resources available. Even in remote areas around the world, academic staff are dedicated to the combination of research and teaching. Their commitment is not dependent upon their status, and often not even upon their remuneration. Calculating students who project their, somewhat distorted, expectations upon staff members tend to assume that the faculty is generally not very eager to invest much time in supporting students, certainly not bachelor and undergraduate students. If you approach a teacher to bargain about your grades in an ostensibly calculating manner – you received a 5.2 and start negotiating to receive a 5.5 (the minimum requirement to pass in most countries) – it should not come as a surprise that the teacher also behaves in a calculating manner. It is likely that the staff member will be absent or will make you feel that this is not a priority. It has been shown, however, that faculty members at some of the top universities in the United States – including even a number of Nobel Laureates – proved to be very receptive to students' concerns, provided that these students entered their room with an informed question and/or showed that they had done their homework (having read some of the professor's academic writings). The inaccessible professor suddenly became very accessible.

Making use of the great potential of academic staff requires that (1) you are willing to listen to and learn from people who are more experienced or knowledgeable than you; (2) you are prepared to invest time and energy to reap the rewards of interacting with existing staff and (3) you do not view staff as 'teachers' – as a burden you have to bear in order to get a sufficient grade – but as 'researchers', 'advisers', 'mentors', 'writers' – which is much closer to their identity and ambition…

- **Dedicated libraries and librarians**: In a Google-world, knowledge accumulation seems to be an individual activity. Nothing is more beyond the point. In the 'old' days universities had big libraries with books and manuscripts. This is still the case, but the function of the library is changing. Nevertheless, notwithstanding the financial limitations of your particular university, most of the time the university is the place where you will still find the best equipped libraries and the best trained librarians *relative* to other nearby facilities. Why? Because universities make it their business to invest in 'knowledge', and academic staff deals with relatively well-informed customers (you), who prompt them to continuously request good library facilities. Librarians are trained to be of assistance to you and their self-esteem is often dependent on the degree to which they are capable of assisting you in your research efforts. Librarians around the world also have a professional interest in finding things on the Internet, so their advice can be very useful before you start 'Googling around' to find information. Besides, large amounts of relevant information cannot be found through the Google search engine(s) (→ A18). Many students who did internships at international organizations, government departments, companies, and the like, found out that these organizations often have no access to very sophisticated databases and sources. They return to the university library to find the relevant information. Libraries (or comparable facilities) provide 'safe spaces' to study, think alone and – to be honest - also to meet your peers. They are a serious environments other than the café around the corner.

Making use of the often excellent university libraries and librarians requires that (1) you understand the limits of Googling around for relevant information, (2) you know where the library is; (3) you know your way around the library, i.e. you have spent some time understanding the system and its manifold applications and (4) you understand why the librarians are there…

- **An intellectual-free haven**: The University – no matter how it is structured – often provides an opportunity to develop your intellectual capacities, thus furnishing you with the competencies to belong to the 'thinking' segment of society. The societal elite of a country strongly corresponds with the intellectual elite of a country. This requires a relatively safe and secure environment to experiment and get feedback on complex issues that necessitate a large number of skills. When you go to university you extend your 'learning' period with the aim to reach higher competencies than you would normally attain; you must learn to walk before you can run. But you should also understand that the level of intellectual freedom, the university can provide depends on the type or organization as well as the type of open-mindedness the academic staff is able to implement. Pay first attention to discussion on scientific 'rigor' versus 'relevance' that guides the direction of research. Pay also attention to the discussion on 'efficiency' versus 'effectiveness' of the kind of teaching that the organization offers. The level of abstract and intellectual thinking that you need to acquire as part of 21st century skills does not come out of a 'toolbox' but will be the result of a thriving intellectual community. Are you interested to participate?

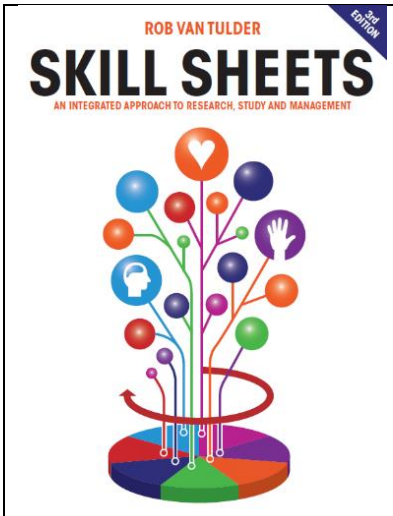
> An intellectual-free haven is only relevant to you if you (1) are interested in independent thinking; (2) want to think in the first place and (3) are willing to learn and receive feedback, (4) want to get engaged in the discourse on relevant theories and methods…

- **Interesting peers**: A university is a meeting place of interesting peers; everybody comes to the university with specific ambitions and ideals; some might be more calculating, but in general no student has ever entered a university just for economic reasons – the alternative being to get a job and earn some 'real bucks' straight away. Moreover, your fellow students come from all over the country (or even the world) and probably have had some interesting life experiences. It is a matter of tapping into these stories and experiences. Your university experience will become a 'micro cosmos' of what you will encounter during the rest of your life – although right now in a somewhat more controlled environment. Didactic research has found that you often learn more from your fellow students than from lecturers. It might start with 'how to fry an egg' (if you have left the parental home for the first time), but can proceed into very rewarding exchanges of insights and experiences on how to analyze society and how to come up with interesting solutions to real problems.

> Making use of interesting peers requires that you (1) understand the basics of 'peer teaching' and the way in which you can profit from an intelligent exchange with your peers and (2) are prepared to act as a peer to your fellow students as well…

- **Promoting high standards**: Universities are increasingly competing to establish and maintain high standards; in the bargaining society they are judged on the basis of peer reviews (visitation commissions) of their educational, research and administrative quality. Whether or not these systems are fair and effective is contingent upon a large number of variables. But it implies in any case that there is a strong sense of quality control at most universities around the world. As a student you can make use of this awareness by demanding the highest possible quality in teaching, examinations and related activities. Faced with the serious flaws in the organization of their own community, and the many cases of fraud or poorly executed (lazy) research, many disciplines have started to discuss how to create higher standards. At the same time, a discussion has appeared on how to make science more 'relevant' for complex and multidisciplinary/qualitative topics that a more calculating community of researchers tends to abstain from. It is worthwhile to keep track of the most important discussions in these areas. In case your university does not engage you in this discourse, you should ask for greater transparency.

> The commitment to high standards requires that you are interested in the quality (1) of life, (2) of your environment and (3) of the activities in which you participate It also implies that you keep track of the discourse that appears in the scientific disciplines on which you base your information.



The Skill Sheets provide detailed help for anyone willing to engage in this co-creation effort. Consider the following Mottos for further inspiration:

Skill Mottos

- *Everyone can acquire a minimum mastery of all relevant Skills. It is a matter of attitude.*
- *You are as skilled as the weakest link in your Skill Circle.*
- *Dare to enter the discomfort zone!*
- *There is only one right way to go through the reflective cycle (and it does not direct to the left).*
- *'A person is not shaped by the skills (s)he has, but by the choices (s)he makes on the basis of these skills' (cf. Boers, Lingsma, 2003).*
- *Skills can be taught, but – more importantly – they can be learned.*
- *Practice, practice, practice? No, the impact of quality always prevails over quantity.*

- **… shaping your environment requires heart-head and hands together!**

This is a positive choice. To help and inspire you further, the five basic building blocks of the Skill sheets formula have been explained in a 20 minute video which summarizes it as the 'heart' formula:

	Technique	**Principle**
Holistic	The skill Circle	You are as strong as your weakest skill link
Energize	The learning cycle	Change your discomfort zone into a ' flow'
Activate	Motivation pathways	Activate intrinsic and extrinsic motivations to progress
Reflect	Reflective cycle	Always take the right turn and go through the whole cycle
Triangulate	The synthesis challenge	Strive for a synthesis – not a compromise – between head (thinking) – heart (passion) and hands (doing/action)

The clip (in Dutch and English) can be found on:

- www.skillsheets.com
- www.robvantulder.nl

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