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Auli Guillard (ed.)

## SOCES HANDBOOK - ASSESSMENT OF TRANSVERSAL COMPETENCES

FOCUS ON ENTREPRENEURSHIP, SENSE OF INITIATIVE  
AND SOCIAL SKILLS

Auli Guiland (ed.)

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SENSE OF INITIATIVE AND  
SOCIAL SKILLS



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SOCES proposes a framework for the methodical assessment of the previously mentioned important working life competences, which can be used for assessment and quality assurance.

#### **Project consortium:**

SOCES project was coordinated by Coventry University, UK (Head of Academic Development Martin Jenkins) and run in collaboration between the following partners:

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- **Coventry University, UK** (Head of School for Energy, Construction and Environment Stephen Austin, HE Consultant and Researcher Sarah Wilson-Medhurst)
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- **St. Cyril & St. Methodius University of Veliko Turnovo (VTU), Bulgaria** (Prof. Margarita Torodova, Senior lecturer Donika Valcheva)

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Auli Guillard (Laurea UAS)

## 1. INTRODUCTION

The development of digital technology and logistics has promoted globalisation and modernisation of working life creating an increasingly interconnected world and given rise to the knowledge societies. “*Knowledge about societies are capabilities to identify, produce, process, transform, disseminate and use information to build and apply knowledge for human development. They require an empowering social vision that encompasses plurality, inclusion, solidarity and participation.*” (UNESCO, 2005.)

Societies face collective challenges such as balancing economic growth with environmental sustainability, and prosperity with social equity. Individuals need to master various technologies and to continuously select between and make sense of large amounts of information. The competences that individuals need to display, have become more complex, requiring more than mastering of certain limited skills.

Facing these challenges, education should offer ways to diminish social, digital, and knowledge division and exclusion. Special emphasis is required to assure that education at all levels correspond to the needs of real-life situations thus enabling students to develop appropriate competencies for social and working life. Educational programs should consider, and whenever possible, reflect authentic real life applications. Particularly on the post-secondary level, a key function of teaching and learning today should be preparation of students for careers and the rapidly evolving challenges of the 21 century.

Innovative teaching and learning practices should be applied in all education institutes: in schools, universities, vocational education and training. The use of digital technologies and opening up participation and collaboration should spread through all types of institutions and all educational programmes. (Inamorato dos Santos, Punie & Castaño-Muñoz, 2016, p.26.)

The assessment of skills and competences should be considered important both in education and professional life. Traditionally assessment is understood as grading and often it concentrates on the outcome. At best assessment is an integral part of the learning process that develops throughout the study unit and guides the student or team in the learning process (formative) and not just giving grades (summative). Ideally, the students have an active role in assessment. The instructor and students could co-operatively determine the criteria by which the judgements are made regarding the work. Individual and collective as well as self-, peer and teacher assessment should be seen complementary. In appropriate combinations, they allow feedback and encourage students and student groups while promoting a culture of shared purpose and learning. Well adapted, tested assessment tools can assure reliable and valid information and promote learning.

### 1.1. Competences and skills

Skills are described, on the one hand, as human characteristics which can develop through education, training and experience although personal traits play an important role in developing some skills (OECD, 2011). On the other hand, skills can be described as “*generalizable attributes of individuals that confer advantage in the labour market*” (Esposto, 2008).

Competences are broader than knowledge and skills (Rychen & Salganik, 2000). While skills are considered as human capital or potential, the competency approach focuses on what the people can do rather than what they know. Competences are described as “*behavioural manifestations of talent*” (Boyatzis, 2008) or “*observable aspects of performance in specific circumstances*” (Spencer & Spencer, 1993). Competences are not personal constructs or traits but rather dispositions that can be attributed to individuals, teams and organisations. They are latent attributes identified and defined in a community of practice (Spencer & Spencer, 1993) and structured around demands and tasks (Rychen & Salganik, 2000).

“*Fulfilling complex demands and tasks requires not only knowledge and skills but also involves strategies and routines needed to apply the knowledge and skills, as well as appropriate emotions and attitudes, and effective management of these components. Thus, the notion of competencies encompasses cognitive but also motivational, ethical, social, and behavioural components. It combines stable traits, learning outcomes (e.g., knowledge and skills), belief-value systems, habits, and other psychological features. In this view, basic reading, writing and calculating are skills that are critical components of numerous competencies.*” (Rychen & Salganik, 2000).

“*Key competencies reflect a notion of what constitutes a good and successful life for individuals beyond the satisfaction of elementary personal needs.*” (Rychen & Salganik, 2000). The European framework (ANC 2006/962/EC) describes competences related to basic cognitive skills, these being communication in the mother tongue, communication in foreign languages, mathematical and science and technology competences.

Transferable competences are defined as competences that can be transferred from one job to another (OECD, 2012). They are sometimes also called transversal, generic, soft or employment competences. They can be learned within an educational or a social context and then transferred to a career, and generally be used and developed in all areas of people’s life. Transversal competences include digital skills, learning skills, social and civic skills, sense of initiative and entrepreneurship, and cultural awareness and expression.

Competences are not innate, inborn characteristics but they are instead learnt characteristics. Learning competences is an on-going, lifelong, learning process which occurs in multiple settings. “The settings and social institutions relevant for the development of competencies besides school are family, peers, work, political life, religious life, cultural life, etc.” (Rychen & Salganik, 2000).

“Competency learning is not only a matter of personal effort. The development of competencies assumes a favourable social and ecological environment, which includes but goes beyond the satisfaction of basic needs (food, housing, health, etc.). It is also dependent on the quantity and quality of learning opportunities. Therefore, the structure of the economy and social institutions plays an important role in the development of competencies.” (Rychen & Salganik, 2000).

This handbook concentrates on two competences that are tightly interlinked namely: social competences, sense of initiative and entrepreneurship. While the critical importance of these competences in future employment is widely recognized, in most countries the educational practices and the connected assessment methods are still under development (EACEA/Eurydice, 2012; International Bureau of Education, 2016).

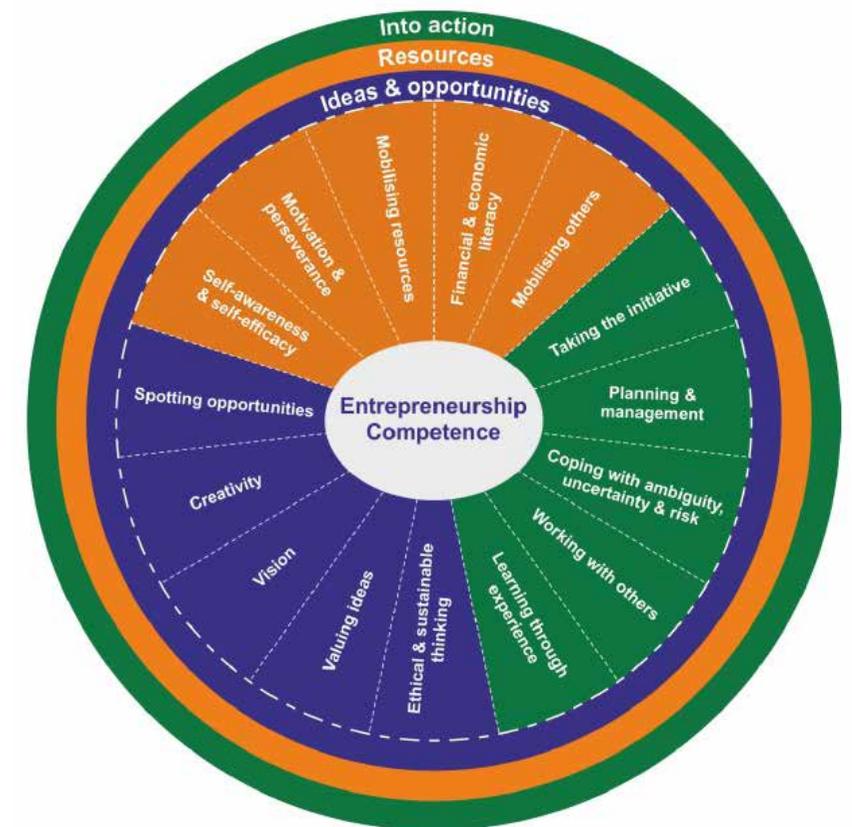
## 1.2. Entrepreneurship competence

“Entrepreneurship is when you act upon opportunities and ideas and transform them into value for others. The value that is created can be financial, cultural, or social” (FFE-YE, 2012; Bacigalupo, Kampylis, Punie, Y. & Van den Brande 2016). This definition incorporates value creation in the private, public and third sectors and in any hybrid combination of the three and “embraces different types of entrepreneurship, including intrapreneurship, social entrepreneurship, green entrepreneurship and digital entrepreneurship”. (Bacigalupo & al., 2016.)

“Entrepreneurship as a competence applies to all spheres of life. It enables citizens to nurture their personal development, to actively contribute to social development, to enter the job market as employee or as self-employed, and to start-up or scale-up ventures which may have a cultural, social or commercial motive.” (Bacigalupo & al., 2016.)

Entrepreneurship, sense of initiative and social competences, which are in the focus of this handbook, are tightly intertwined and entrepreneurship stands above them all. The recent conceptual model created by the EntreComp project considers that entrepreneurship consists of 15 different competences or building blocks as presented in Figure 1. (Bacigalupo & al., 2016.)

“Depending on the context of take-up, it is reasonable to expect that more emphasis may be put on some of the competences and less on others, or else that competences are streamlined to mirror an entrepreneurial process created to foster learning through entrepreneurship. In other words, the EntreComp Framework can be seen as a starting point for the interpretation of the entrepreneurship competence, which over time will be further elaborated and refined to address the particular needs of specific target groups.” (Bacigalupo & al., 2016.)



**Figure 1:** Entrepreneurship: Areas and competences, EntreComp conceptual model (source: Bacigalupo & al., 2016.)

### 1.3. Competences in business management and recruitment

by Seija Aalto (Savares)

An important human resources (HR) and recruitment network (CIPD) defines the competency related terminology in the following way: In the past, HR professionals have tended to draw a clear distinction between 'competences' and 'competencies'. The term 'competence' (competences) was used to describe what people need to do to perform a job and was concerned with effect and output rather than effort and input. Competency (competences or competencies) described the behaviour that lies behind competent performance, such as critical thinking or analytical skills, and described what people bring to the job. However, in recent years, there has been growing awareness that job performance requires a mix of behaviour, attitude and action and hence the two terms are now more often used interchangeably." (CIPD)

A "competency model" consists of a set of competencies that are relevant to the performance in a particular job, job family, or functional area arranged by job role. For example, an organization may have a set of competencies for one job (e.g., database engineer), and a similar but somewhat different set of competencies for a related job (e.g., senior database engineer). The more senior roles may have new competencies added.

A competency framework is a broad framework for integrating, organizing, and aligning various competency models. Hence a competency framework, as used in HR, is a structure that sets out and defines each individual competency (such as problem-solving or people management) required by individuals working in an organisation or part of an organisation. (CIPD.)

In a competency framework a critical aspect is considered to be the degree of detail. If a framework is too broad (containing only general statements about individual competencies), it will fail to provide adequate guidance either for employees as to what is expected of them or to managers who have to assess their staff against these terms. If, on the other hand, it is too detailed, the entire process becomes excessively bureaucratic and time-consuming and may lose credibility.

According to CIPD research, typical skills found in employer competency frameworks include:

- communication skills
- people management
- team skills
- customer service skills
- results-orientation
- problem-solving.

Similar findings have emerged from other recent research (Suff, 2010).

Competency frameworks are used in addition to recruitment also as a tool for improving organisational performance and change management through focussing and reviewing each individual's capability and potential. According to CIPD research, employers most commonly use competency frameworks for employee reviews/appraisal; enhanced employee effectiveness; greater organisational effectiveness; better analysis of training needs as well as enhanced career management.

### 1.4. Recruitment tests and human resources practices in business

by Seija Aalto (Savares)

An increasing number of organisations are using psychometric tests to aid the employee selection process and also to assist in teambuilding, organisational and human resource development and change management processes. According to a survey conducted by the Society for Human Resource Management about 18% of companies currently used tests in the hiring process in 2013. The number is growing at a rate of 10-15% a year according to many industrial and organizational psychologists, as well as the Association for Test Publishers. (Dattner, 2013). Overall, 70.2% of all companies responding to the survey indicated that they used some form of assessment, as defined above, with at least one population in their organization. Although similar studies of this nature are not directly comparable (because they were focused solely on high potential identification and not formal assessments), this finding provides a more realistic counter balance to the perhaps somewhat unrealistic highs of 90-100% reported in smaller studies cited above. It also supports the observation made earlier that assessments may have become more popular recently, at least in large organizations with well-established talent management and leadership development functions. In short, over two-thirds of these top companies do have formal standardized assessments efforts in place today.

The tests used in recruitment and human resource development are designed to measure person's suitability for a specific role based on the personality characteristics and aptitude i.e. cognitive abilities. Desirable competencies assessed by psychometric tests include an ability to adapt quickly and deal with change, as well as networking and individual leadership and strategic capability. Interpersonal communication skills, related to teamwork, are also often included on key deciding factors.

In general, all psychometric tests include two sections:

1. An ability testing, this includes a range of psychometric aptitude tests – verbal reasoning, numerical reasoning, abstract reasoning, and other non-verbal reasoning tests – some of which are already performed online without actual attendance at an assessment centre. Online testing is becoming increasingly popular. The advantage of online testing is that once the test is completed, an analysis of the results can be calculated straight away.

2. A behavioural psychological section which includes competency based interviews, personality questionnaires, and assessment centre exercises such as group exercises, role play exercises, situational judgment tests, In- and E-tray tests, written exercises, case studies and sometimes serious games.

#### 1.4.1. Psychometric tests

##### **Aptitude tests**

Aptitude tests are generally designed to measure the work-related cognitive capacity and usually measure both so called fluid and crystallised intelligence. The theory of fluid and crystallised intelligence suggests that people's intelligence is composed of a number of different abilities that interact and work together to produce overall individual intelligence.

Fluid intelligence is considered independent of learning, past experience, and education and the use of it can be related to abstract reasoning, pattern recognition, problem-solving, ability to quickly learn new skills, ability to quickly integrate new information, strategic thinking, etc. Within the business environment, fluid intelligence is used to predict person's capacity to work well in environments characterised by complexity, uncertainty, and ambiguity. Abstract reasoning requires an ability to draw assumptions and conclusions based on information supplied in the form of symbols or matrices. In such tests participants will be asked to identify a missing item or diagram that complete a certain pattern of logic, usually in the form of a matrix.

Crystallised intelligence is the ability to learn from past experiences and relevant learning, and to apply this learning to work-related situations. Work situations that require crystallised intelligence include comprehending written reports and instructions, ability to produce reports, ability to use numbers as a tool to make effective decisions, etc. This type of intelligence is based upon facts and rooted in experiences, and becomes stronger as we age and accumulate new knowledge and understanding. There are many aptitude tests that measure different aspects of crystallised intelligence. The most common are verbal reasoning, numerical reasoning, spatial reasoning and mechanical reasoning.

##### **Emotional intelligence**

An increasing trend in testing is to include emotional intelligence testing. The concept of Emotional Intelligence (EI or EQ) developed in the 1990s. The EQ is used as a measure of emotional skill level. It reflects the ability to understand your emotions, to control your emotional reactions, to motivate yourself, to understand social situations and to communicate well with others. EQ is particularly important in activities involving team work, dealing with others on a one-on-one basis and displaying leadership behaviours. Whether or not you are emotionally intelligent and will score high in an EQ test, is typically determined by five personality traits which have been proposed by Reuven Bar-On. These are:

- Interpersonal intelligence (social responsibility / empathy)
- Intrapersonal intelligence (emotional self-awareness)
- Adaptability (flexibility / reality testing)
- Stress management (stress tolerance / impulse control)
- General mood (cheerful / sombre / optimism)

There are many theories on EQ that are closer to a personality theory than to a measurement of abilities, as is the case with an IQ test. Two influential models which can be considered to be personality measurements, are the ones developed by Bar-On (1997) and Goleman (1995). Both also talk about an EQ test. The dominating models on emotional intelligence measurements are the ability model, the mixed model and the trait model.

The ability model proposes that EI includes 4 types of abilities:

- Perceiving Emotions
- Using Emotions
- Understanding Emotions
- Managing Emotions

The test based on this model is the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) which uses emotion-based problem-solving.

The mixed model, introduced by Daniel Goleman, focuses on EI as a wide array of competencies and skills that drive leadership performance.

- Self Awareness: The ability to read one's emotions and recognize their impact in decisions.
- Self Management: Involves controlling one's emotions and impulses and adapting to changing circumstances.
- Social Awareness: The ability to sense, understand, and react to other's emotions
- Relationship Management: the ability to inspire and influence others and manage conflicts

The main tests related to this model are The Emotional Competency Inventory (ECI), developed by Goleman and Boyatzis, which provides a behavioural measure of the Emotional and Social competencies and The Emotional Intelligence Appraisal, which can be taken as a self-report or 360-degree assessment.

The trait EI model, developed by Petrides, refers to an individual's self-perceptions of their emotional abilities and is measured by self-report.

##### **Personality tests**

The personality describes how a person inherently "is"; for example, introvert or extrovert or "thinking oriented" or "feeling oriented". In measuring the personality the Big Five Personality Traits model, also sometimes called OCEAN model, is now a

broadly respected personality scale, which is routinely used in business and in psychological research. It measures five key dimensions of people's personalities:

- Openness (sometimes called intellect or imagination), is used to measure level of creativity, and desire for knowledge and new experiences.
- Conscientiousness is used to determine organisational skills and how to make plans and follow them through.
- Extraversion/Introversion is measuring the level of sociability.
- Agreeableness is used as a measure for empathy and friendliness.
- Natural Reactions (sometimes called emotional stability or neuroticism measures the emotions and stress resistance. (Goldberg, 1992.)

There are currently well over 2,500 personality questionnaires on the market and each year dozens of new companies appear with their own 'new' products. Some of these products are broad-spectrum tests designed to classify basic personality types, some are designed to test candidates for suitability for a particular job and some are designed to test for particular traits – for example, honesty and integrity (<http://www.psychometric-success.com>). The questionnaire is supposed to discover what kind of person you are in ways that you wouldn't necessarily admit to in an interview, with questions designed to expose how you behave and what motivates you. A good test will be set up to pick up on any inconsistencies and make it difficult for you to put on an act – there is a built-in "lie scale". However, the reliability of the personality tests is often questioned. The most widely used personality tests are The Myers-Briggs Type Indicator (MBTI) and The SHL OPQ32 and the 16PT Personality Test.

### **Trends**

The psychometric assessment consists generally of an interview, a number of aptitude tests (online or paper-based tests). Depending on the level of the role and complexity of the assessment the test is supported with role plays and as a recently also with game assessments.

A trend that affects the selection process is that more people are comfortable using a computer and the internet, which leads psychometric test developers to administer psychometric tests online rather than asking candidates to come into an office to complete paper-based tests.

Use of more interactive and tailored assessments such as Situational Judgement Tests that assesses judgement required for solving problems in work-related situations or simulation games is increasing. The challenge with these tests is to build real validity into an engaging experience, which both samples the desired behaviours and gives a realistic job preview. The use of serious games of serious games is still limited, however quickly increasing. An example is Revelian's new applicant assessment tool in gamified recruitment assessment that combines gamification with analytics, data, predictive psychometric models and cloud technologies. The game, 'Theme Park Hero', is designed to measure candidate ability including mental

agility, cognitive speed, attention span, spatial aptitude and numerical reasoning ([www.revelian.com](http://www.revelian.com))

### **1.4.2. Competence measurement**

#### **Multisource Feedback**

360-degree feedback (Bracken, Timmreck, & Church, 2001) has developed to a core HR process. Most companies today have had some experience with 360 tools for developmental or organizational change purposes (e.g., Church, Waclawski, & Burke, 2001). Despite some methodological, statistical, and ethical concerns (London, 2001), recent reviews have emphasised the increasing use (e.g., Nowack & Mashihi, 2012) (Dalton & Hollenbeck, 2001), (Bracken & Church, 2013).

#### **Online Assessment**

The online assessment tools that are readily available include the tests as Big Five, 360 Degrees, Influencing Styles, Quinn's test, Matrix and tests of verbal and numerical reasoning. In addition Digital role playing or WEBCAM tests and Situational Judgement tests are often provided on-line.

#### **Digital roleplay**

In a digital role play a candidate sees a situation with a recorded actor online. The candidate responds spontaneously and this reaction is recorded via a webcam. The assessor can evaluate the candidate's reactions later. In this way a semi-interactive 'real life' conversation occurs between an actor and the candidate. The goal is usually to assess the communicative, management and commercial competencies of candidates. The advantages indicated to a digital role play in comparison to a live role play is that it takes less time, is more reliable and all candidates complete the same test it.

#### **Situational Judgement Test**

A SJT consists of tasks in which short films are played. For each task a question is asked about the corresponding movie. The candidate indicates which answer best suits him or her.

#### **In-tray Exercise** (source: [www.jobtestprep.co.uk](http://www.jobtestprep.co.uk))

An in-tray test is used by assessors to evaluate additional skills which are not usually measured through ordinary aptitude tests. Its main objective is to assess managerial abilities, prioritisation, organisation, problem solving, and time management skills. In-tray exercises simulate real-life workplace situations. You are asked to take the role of one of the employees in a fictitious company, usually in the role you are applying to. You are provided with documents portraying the company's profile and given different tasks simulating a typical work day. You might be told, for instance, that you have just returned to the office after a week's absence and must go through e-mails and memos, return phone calls and complete multiple tasks. Your position in this exercise is based on the role you are applying for, and the materials, tasks and actions required are usually based on the job. Background documents include company information, organisational charts and role specifics. The material for the tests

includes memos, emails, faxes, minutes, papers and so on, and you have to complete a task based on these pieces of information. Tasks include ranking documents in order of urgency or priority. In some tests you are also asked to describe the actions you would take, or explain why you have chosen this priority or action.

The in-tray exercise is a very different test to many of the other tests that you will take during your recruitment process or at an assessment centre. You are tested on a range of skills including:

- Time management
- Organisation of work load
- Prioritisation and making sound decisions
- Management ability - i.e. delegation, taking responsibility, decision making and so on
- Office relationships
- Understanding of organisational culture and structure

In some recruitment processes the in-tray exercise has been replaced by an e-tray exercise. Although the names are similar, the style of exercise and tasks usually differ. In an in-tray exercise you are provided with hard copies of the documents you need to work with. Additionally, you may face an assessor who will want to discuss your behaviour and reactions on the test.

#### **E-Tray Exercise** (source: [www.jobtestprep.co.uk](http://www.jobtestprep.co.uk))

E-tray exercises, on the other hand, provide an online computerised simulation. As a result, the testing environment is different, as are the style of questions and tasks you are required to perform. These tests are provided by numerous assessment companies. They are usually part of the assessment centre stage of the application process for many big employers, such as Deloitte, KPMG, Shell, and the UK Civil Service, but can also be taken online in some cases. The exercise usually consists of three parts: Background information, online inbox simulation, and a writing task. Sometimes there is no writing task, or it is done orally as part of the following interview. Time limits and number of questions differ between test providers, but are usually about one and a half hours for 25 questions.

#### A typical E-tray test: (source: [www.jobtestprep.co.uk](http://www.jobtestprep.co.uk))

Background information (about 10-15 minutes) in the first part you need to review various documents describing your role in the company, the company's organisational structure and values, current affairs and so on. There may even be a calendar with several appointments already set in it. All of these documents will be organised in folders with indicative titles to help you figure out where everything is. Your performance is not assessed here, as this is only meant to provide you with the information you need in order to answer the questions in the following parts of the exercise.

Online inbox simulation (about 60 minutes) Emails from different people arrive at your inbox. These can be from your boss, your boss' secretary, your subordinates, someone from your team or people outside your work place. Each email is

accompanied by a question, the nature of which depends on the position you have applied for; customer service applicants will probably have to handle angry clients, whereas managers may have to analyse financial reports or recommend new strategies. The background information is still accessible at this stage, so you can use it to decide how important the message is and how to handle it. Some emails may include attachments with further information you will need to consider before you answer the question.

The questions are usually multiple-choice, asking you to choose the most appropriate course of action. Some versions ask for the least appropriate response as well, so you need to choose two answer choices. It is important to understand, however, that the distinction between correct and incorrect answers here is not as clear-cut. For this reason, if you choose the second-best response instead of the most appropriate one, you should still be credited with some of the points. You can find some question examples and tips here. Some of the later emails you will receive may relate to previous ones you have already replied to. You will not be allowed to change your answers, but you will be able to review them as many times as you like. These follow-up messages will only arrive after you have replied to the first ones, so if you keep messages in your inbox for too long, you will not get the chance to complete enough items.

The frequency of incoming emails usually increases toward the end of the session, to assess your performance under pressure. You should try to respond to as many messages as you can in the time you have left, but beware of making hasty decisions which will result in inappropriate answers. Some of the questions may require the use of a calculator. You will also be able to make notes, either on paper or the exercise software.

Writing task (about 20-40 minutes) in the third part of the exercise you will be asked to type one or more emails in response to some of the messages in your inbox, evaluating your writing and problem solving skills. You will need to make valid arguments, justify your decisions, and use appropriate language, depending on the receiver's identity.

The inbox task is usually scored automatically by a computer, whereas the written exercise is scored by a human assessor, who then gives the final evaluation taking into account your performance on all parts of the exercise.

#### **Simulation Games**

Serious games or simulations are increasingly being investigated for assessment of different competences.

Examples include:

- Theme Park Hero is Revelian's new applicant assessment tool. The gamified recruitment assessment combines gamification with analytics, data, predictive psychometric models and cloud technologies. The game, 'Theme Park Hero', is

designed to measure candidate ability including mental agility, cognitive speed, attention span, spatial aptitude and numerical reasoning ([www.revelian.com](http://www.revelian.com))

- Skyboard is a decision making game of The National Aerospace Laboratory (NLR). (<http://www.nlr.nl/capabilities-iv/serious-gaming>). NLR is the independent knowledge enterprise in the Netherlands on aerospace ([www.NLR.nl](http://www.NLR.nl))
- Eagle Racing and EIS are games developed by INSEAD/CALT. Eagle Racing is a video-based collaborative decision-making simulation game. EIS- is a simulation game on Change management and team work by INSEAD-CALT (<http://www.calt.insead.edu/> and <http://www.alpha-simulations.com/>)
- Information Overload , DigiSIM and Managing the Olympics 2028 are simulation assessment games used by LTP

Further information :

- [www.smartrecruiters.com](http://www.smartrecruiters.com)
- <https://www.ets.org/>
- [http://www.psychometricinstitute.com.au/How\\_to\\_prepare\\_for\\_Chandler\\_Macleod\\_psychometric\\_tests.html](http://www.psychometricinstitute.com.au/How_to_prepare_for_Chandler_Macleod_psychometric_tests.html)
- <http://www.ltp.nl/nl/assessmentwijzer>

## 1.5. SOCCES Project

SOCCES was built on the European framework for eight key competences, defined in 2006 (ANC 2006/962/EC). The goal of SOCCES was to provide teachers and evaluators with a unique and consistent list of entrepreneurial competences, their definitions and operationalisations, and a set of practical assessment tools which allow to measure students' mastery in entrepreneurial transversal competences.

According to Erydice report (2012), whilst the status of the basic skills is well established, the development of the curricula and assessment of the transversal skills is lagging behind. SOCCES project addressed directly the recommendations as defined in the Erydice report and also in the renewed Higher Education Modernisation Agenda (June 2013). The report emphasized that higher education should help students prepare for life and work and provide relevant knowledge, skills and experience – including transversal skills – for future private, social and working life. Innovation in higher education should pay attention to tailoring learning modes to a diverse student body, develop program informed by and adapted to labour market needs and exploiting the potential of ICTs. (HE Modernisation report, June 2013; EC). The report also suggested that curricula should be developed and monitored through dialogue and partnerships among teaching staff, students, graduates and labour market actors, drawing on new methods of teaching and learning, so that students acquire relevant skills that enhance their employability, which was exactly the method used in SOCCES.

EU Communication (Rethinking Education: Investing in skills for better socio-economic outcomes) stated that assessment needs to be better harnessed. “Efforts

*should continue to develop tools for individual assessment of skills, particularly in the areas of problem solving, critical thinking, collaboration and entrepreneurial initiative”* (Strasbourg, 20.11.2012 EU COM (2012) 669 final). The impact of assessment and validation of skills is significant in facilitating mobility in the European labour market, addressing skills shortages in growing sectors and supporting economic recovery (EU COM (2012) 485). Brian Holmes, head of EACEA, stated in “*New ways of learning need new ways of assessing*” (Online Educa, Berlin, 2010) and NAHE (2008) that current methods of quality assessment need to be adapted for virtual learning. As a result of the findings the EU Council invites member states to make arrangements for validating non-formal and informal learning.

## 1.6. About SOCCES Handbook

This SOCCES Handbook is targeted to teachers and evaluators who wish to use the SOCCES assessment frameworks, methods and tools proposed for assessing transversal competences. The Handbook intends to provide a bridge between broad, high level overviews and explicit, detailed guidelines applicable to the needs of a specific institution. It aims to facilitate the assessment process aims, steps and grading methods.

The strategic overviews presented in the SOCCES Handbook intend to link to operational activities in order to reinforce the need to develop practical procedures grounded firmly in the educational mission of the institution. The Handbook provides pointers for finding further guidance and for assisting development of policies and practices applicable in individual institutions.

Ideally, the SOCCES Handbook could be used to help focus thoughts, increase overall understanding, promote training, and act as a catalyst for further action and to oil the wheels of that process.

The SOCCES Handbook is divided into five chapters that are linked together but can also be used independently. Each chapter has been written by different experts reflecting the way of thinking and researching the specific issue.

The first chapter discusses the background of the work done for this handbook and gives general information on the Erasmus+ funded project through which the development work was channelled. The second chapter presents the main results of the work namely the assessment framework (Annexe 2) and the selected methods and tools which are available in the SOCCES toolbox ([www.socces.eu](http://www.socces.eu)). The third chapter discusses learning environments which are suitable for assessing transversal competences in challenging students to develop and express transversal competences. The main focus is on building a business case through which teaching and learning will happen. Chapter four and five give complementary information to chapter three in the form of practical guidance on virtual collaboration as well as confidentiality and intellectual property right issues.

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## 2. ASSESSMENT

This chapter concentrates mainly on presenting the assessment framework and assessment methods and tools that are proposed for assessing transversal competences. The main goal of the chapter is to give a general view of assessment and more precisely guide in teachers and evaluators in planning the assessment of selected transversal skills. The actual assessment methods and tools are presented in the SOCCES toolbox which is available on the project website: [www.socces.eu](http://www.socces.eu).

### 2.1. Introduction and Background for Developing Assessment

Assessment is the process of gathering and interpreting evidence to make judgements about student learning. It is the crucial link between learning outcomes, content and teaching and learning activities. Assessment is used by learners and their teachers to decide where the learners are at in their learning, where they need to go, and what is the best way to get there. The purpose of assessment is to improve learning, inform teaching, help students achieve the highest standards they can and provide meaningful reports on students' achievement.

#### Types of Assessment

Diagnostic assessments (also known as pre-assessments) provide instructors with information about student's prior knowledge and misconceptions before beginning a learning activity. This is a type of assessment which examines what a student knows and can do prior to a learning program being implemented.

Assessment of students' skills and knowledge upon entry to the program provides a baseline against which to assess progress.

Assessment can be both a formative and summative process. Formative assessment is used to provide feedback to students and teachers to promote further learning. Summative assessment contributes to the judgement of student learning for reporting and certification purposes.

- **Formative assessment** – is assessment for learning. It is used at the beginning of an instructional period and during the process of instruction as teachers check for student understanding. Diagnostic tools determine what students already know and where there are gaps and misconceptions. Formative assessment also includes assessment as learning, where students reflect on and monitor their own progress. The information gained guides teachers' decisions in how to enhance teaching and learning. Formative assessment enables students to learn through the process of feedback and opportunities to practice and improve. As students reflect on and monitor their progress this process effectively becomes assessment as learning and contributes to students planning future learning goals.
- **Summative assessment** – is assessment of learning. It is used towards and at the end of the instruction period. Teachers document the culmination of students' learning achievements through tasks that invite students to demonstrate their mastery and knowledge of the course content. Summative assessment data provides teachers with information about how effective teaching strategies have been, time needed for instruction and how to improve teaching for future students.

In 2002 the Assessment Reform Group (Cambridge University, School of Education) produced ten principles that are foundational to assessment for learning.

Assessment should:

1. be regarded as a key professional skill for teachers
2. be part of effective planning of teaching and learning
3. promote commitment to learning goals and a shared understanding of the criteria by which they are assessed
4. be recognised as central to classroom practice
5. focus on how students learn
6. provide constructive guidance about how to improve
7. develop learners' capacity for self-assessment so that they can become reflective and self-managing
8. take account of the importance of learner motivation
9. be sensitive and constructive because any assessment has an emotional impact
10. recognise the full range of achievement of all learners

## 2.2. Assessment in education

Assessment in education is defined as a process of gathering evidence, making judgments and drawing inferences about student's achievements and performances (Curtis, 2010). Pellegrino, Chudowsky & Glaser (2011, p. 42) described assessment as "a tool designed to observe students' behaviour and produce data that can be used to draw reasonable inferences about what students know".

To date, the theoretical debate on assessment and the methods to assess has suggested that "the aim of assessment is primarily to educate and improve student performance, not merely to audit it" (Wiggins, 1998, p. 7). Therefore, assessment not only plays a role of certification or final stage of a teaching a learning program, but it is considered as part of building knowledge process (Segers, Dochy, & Cascallar, 2003). Teaching is increasingly seen as a scaffolding activity aimed at supporting students to operate at the edge of their competences. In this perspective, assessment should provide feedback on where students are and how they could be supported to progress further, in order to promote meaningful learning. This occurs when learners are actively involved and have the opportunity to take control of their own learning process. Under this perspective the main role of assessment consist in providing feedback to learners, emphasizing metacognition, self-assessment and the transferability of knowledge and competences acquired within other settings (Packer & Goicoechea, 2000).

In the last decade, literature has therefore pointed out a change in the perspective regarding the practices, methods, tools and aims of assessment. As summarized by Segers & al. (2003), new directions in assessment regard a shift from de-contextualization to authenticity, from single to multiple measurements, from a low to a high assessment of comprehension, from assessing a few to assessing many dimensions of intelligence, from the separation to the integration between assessment and learning processes, and from the idea that assessment is teacher directed to the notion of student's responsibility in evaluation (see Figure 2).

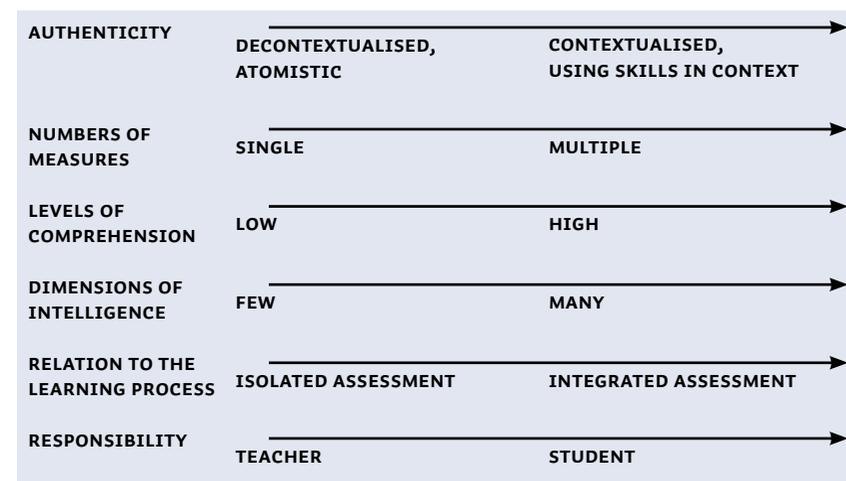


Figure 2. New directions in assessment (Segers & al., 2003)

Mixed methods and models of assessment, which include assessment elements as suggested from classical measurement, cognitive, and constructivist theoretical approaches to learning, can be seen in line with these new directions.

All these theoretical approaches present both strengths and weaknesses in the assessment of students' transferable competences, as highlighted in Table 1. Therefore, it can be suggested that an adequate assessment should include mixed models of assessment, i.e., elements from classical measurement, cognitive, and constructivist theoretical approaches to education.

Table 1. Strengths and weaknesses of different theoretical approaches to assessment

THEORETICAL APPROACH	STRENGTHS	WEAKNESSES
BEHAVIOURISM	EVIDENCE BASED APPROACH ASSESSMENT BASED ON INDICATORS	MORE FOCUS ON LEARNING OUTCOMES RATHER THAN LEARNING PROCESSES RISK TO INHIBIT MOTIVATION
COGNITIVISM	EMPHASIS ON SELF-REGULATION SYNERGY WITH LEARNING PROCESSES	GENERALIZABILITY OF RESULTS LACK OF STANDARDISATION
CONSTRUCTIONISM	COMMITMENT FOCUS ON LEARNER	GENERALIZABILITY OF RESULTS LACK OF STANDARDISATION

Adopting this view, the main role of assessment should be that of providing feedback to learners, emphasizing metacognition, self-assessment and the transferability of knowledge and competences acquired within other settings (Packer & Goicoechea, 2000). Assessment tools should therefore be authentic and contextualized (i.e., using skills in context), adopting multiple measures, having high levels of comprehension, assessing many dimensions of intelligence, offer an assessment integrated with the learning process, and being student-centred (Segers & al., 2003).

## 2.3. Assessing transferable competences

The assessment of transferable competences is particularly challenging since these competences are not easily definable, neither completely separated from competences related to contents. The methods of assessment of transferable competences should therefore be concerned on three key issues (Gibb, 2014). First, the contexts (inputs), i.e., transferable competences should be clearly specified in order to define "good performances" and to contextualize it into the educational or organizational

goals, characterizing the broader learning environment. Second, the content of transferable skills assessment, which is related to quality and asks for fair methods and tools for evaluating such competences, using observations, data and inferences and quality information. Third, the consequences (outcomes) of transferable skill assessment, which should consist in making learners aware of their behaviour, reflect on their own experiences, self-motivate and going on in a path of formative assessment for receiving constant feed-back for self-improvement. At the same time soft skills assessment outcomes have a formative impact on the further teaching and training activities (Gibb, 2014, p. 466).

In line with these considerations, the assessment of transferable competences should (a) serve diagnostic, formative, summative, and certification purposes; (b) use models of competence development based on cognitive research, but transforming psychometrics to deal with new kinds of assessment and making students' thinking visible; (c) account for new modes of communications (e.g., ICT); (d) include collaboration and teamwork (i.e., integrate individual performance evaluation by assessing collaborative tasks); (e) include local and global citizenship; interpreting assisted performance (i.e., ensuring accessibility and customization of items for students with special needs); (f) ensure validity; and (g) consider cost and feasibility (Ketchagias, 2011, p. 129-130). To this extent, a few principles for the methodological development of assessment of transversal competences have been summarized by Ketchagias (2011, p. 121-122) as the following:

- reflecting the development of transversal competences goals and clearly specify the expected soft skills, and their development, from novice to expert;
- include adaptability to different circumstances where such competences are actually used and adopted, even taking into account unexpected situations;
- be based on performance, to give evidence to the ability to apply knowledge to critical thinking, problem solving and analytical tasks, which are key aspects connected with soft skills expertise;
- be formative for teaching and learning processes, offering directions, suggestions and feedback for improving soft competences;
- providing information and improving knowledge on student's cognitive and metacognitive learning strategies;
- assess fairly all learners, even adopting adjustment when necessary, in order to reduce the impact of difficulties and come to an authentically equal evaluation;
- be accurate and reliable, according to assessment purposes, and clearly specify its technical and statistical qualities or limits in order to give the possibility to the evaluator and the evaluated to assess the impact or generalisation of results;
- provide information that can act as feedback not only for learners, teachers but also for policy makers and for a wider public to be sensitised to the importance of soft competences;
- contribute in improving competences and strategies for promoting such competences for educators, teachers, trainers;
- be integrated in a wider assessment system that can authentically improve lifelong learning.

The methods for assessment of transversal competences should therefore use models of competence development based on cognitive research, but transforming psychometrics to deal with new kinds of assessment and making students' thinking visible; account for new modes of communications (e.g., ICT); include collaboration and teamwork (i.e., integrate individual performance evaluation by assessing collaborative tasks); include local and global citizenship; interpreting assisted performance (i.e., ensuring accessibility and customization of items for students with special needs); ensuring validity; and consider cost and feasibility (Ketchagias, 2011, p. 129-130).

Assessment strategies and methodological tools that have been taken into consideration while developing the assessment tools within the SOCCES project in relation to the transversal competencies are:

- **Anecdotal records:** objective narrative records of student performances, strengths, needs, progress and negative/positive behaviour
- **Authentic tasks:** activities that are genuine and purposeful. These can include real-life shopping tasks, measuring a ball-park, designing a home, building a bridge or tower, writing about significant issues and so on
- **Checklists, scales or charts:** identification and recording of students' achievement can be through rubric levels, letter grade or numerical value, or simply by acceptable/unacceptable
- **Conferences:** meetings between the student/parent/teacher and others where progress is checked and goals for growth are established and agreed upon
- **Contracts:** agreements or goals (verbal or written) set by the teacher/parents and the student
- **Games:** games are excellent opportunities for simulations and small and large group assessment
- **Diagnostic inventories:** student responses to a series of questions or statements in any field, either verbally or in writing. These responses may indicate an ability or interest in a particular field.
- **Peer evaluation:** assessment by students about one another's performance relative to stated criteria and program outcomes
- **Portfolios:** collections of student work that exhibit the students' efforts, progress and achievements in one or more areas
- **Rubrics:** a set of guidelines for measuring achievement. Rubrics should state the learning outcome(s) with clear performance criteria and a rating scale or checklist.
- **Self-evaluations:** student reflections about her/his own achievements and needs relative to program goals
- **Simulations:** the use of problem-solving, decision-making and role-playing tasks
- **Student journals:** personal records of, and responses to activities, experiences, strengths, interests and needs
- **Student profiles:** a compilation of data which may include student work samples

- **Student-led conferences:** where the student plans, implements, conducts and evaluates a conference regarding their learning achievements. The purpose of the conference is to provide a forum in which students can talk about their school work with parents/carers and demonstrate their growth towards being self-directed lifelong learners.
- **Teacher observations:** regular, first-hand observations of students, documented by the teacher.

The proposed assessment tools and detailed instructions are based on the growth mind-set concept (Figure 3), emphasizing on the development and improvement processes one can achieve with transversal competences as well as their dynamic nature.

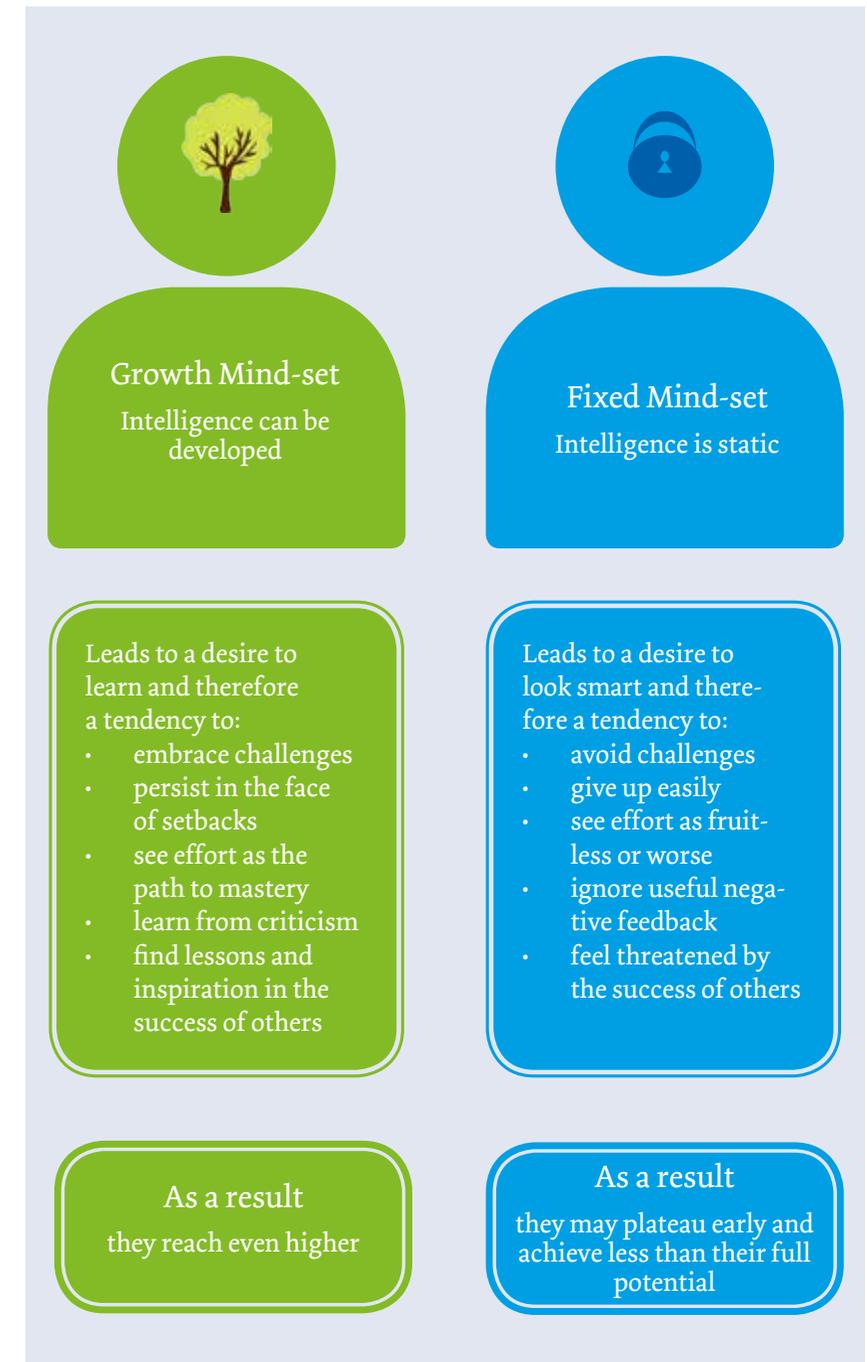
Recent studies have shown that people with so called “growth mind-set” (vs fixed mind-set) (Dweck, 2006, 2006b, 2012) work and learn more effectively and display a desire for challenge and resilience in the face of failure (Boaler, 2013). “On the other hand, students with a ‘fixed mind-set’ believe that you are either smart or you are not” and therefore they are not interested in developing themselves and are unwilling to tackle new challenges (Dweck, 2006). “Dweck’s studies show that around 40% of US students display a growth mind-set and 40% a fixed mind-set, while the remaining 20% show mixed profiles. When students undertake an intervention to move them from a fixed to a growth mind-set they immediately start performing at higher levels in school” (Boaler, 2013).

## 2.4. SOCCES Assessment Framework

The SOCCES assessment framework has been developed through a multi-step method including (1) a baseline analysis mapping the current educational environments and practices in teaching and assessing transversal competences; (2) the selection of assessment elements, methodology and tools; (3) the pilot testing of the assessment framework through two virtually-enabled, real-life business cases; and (4) analysis of data and further refining of assessment tools.

The proposed assessment framework to assess social and entrepreneurial transferable competences regards the following five areas of competences or sub-skills.

1. Positive attitude and initiative
2. Communication and interaction
3. Team-work and collaboration
4. Critical and analytical thinking or problem solving, including risk assessment
5. Creativity and Innovation



**Figure 3.** Growth vs fixed mindset (Figure by Tarja Laakkonen, tree created by Freepik; based on research by Carol Dweck, 2012)

For each of the five identified areas of competence, a list of detailed competences has been developed and operationalized. Each competence can be assessed according to three levels of mastery or expertise: low, medium, and high. These three competence levels were determined according to the data regarding the normative assessment on the students participating in SOCCES pilot tests.

The developed assessment framework has been incorporated in a concrete assessment module that can be used in different educational environments. The module includes a collaborative, virtually enabled assignment (Business case, see chapter 3) and is accompanied with teacher instructions. This assessment framework provides the first step to a modular European assessment and certification system for entrepreneurial competences, an “EuroComPass” for higher education, similar to the European Computer Driving Licence. SOCCES has also elaborated a specific proposal for an EuroComPass to measure Social, Entrepreneurship and Sense of Initiative competences.

An overview of the assessment framework, a comprehensive list of competences and assessment methods, can be found in Appendix 1.

The SOCCES assessment framework applies various assessment methods or tools which ensure evaluation of students’ performances and feedback for students. Specifically, the proposed assessment is intended to be based on a reflexive circle of multiple assessments, including self, peer and teacher.

The competence medium-level mastery is calculated as the average pre-test and post-test median  $\pm$  one standard deviation. For each competence one or more assessment tools are proposed, with the aim of proposing a mixed-method assessment framework and obtaining multiple assessment measures.

## 2.5. Assessment Methods, Templates and Forms

The assessment methods proposed within the framework of the SOCCES project aim to assessing specific entrepreneurial and social competences, falling into five macro-areas of competences, namely: positive attitude and initiative; communication and interaction; critical and analytical thinking; creativity and innovation; teamwork.

The model used to develop those competences (as it can be seen in figure 4 below) is based on the following principles:

- Assessment must be strictly connected to learning goals and learning activities
- Assessment must be formative, in order to provide feedback for constant and progressive improvement



**Figure 4:** The model used for developing the SOCCES assessment framework

- Assessment must be free of judgement: we assess behaviour or outputs we do not assess, evaluate or judge a person
- Assessment is being made within a collaborative environment either physical, virtual or a blended one.

This proposal is characterized by an approach to assessment:

- referred to a multi-phased one-time assessment session, composed by a sequence of assessment tools to be administered to the person to be assessed;
- based on a reflexive circle, including self-assessment, assessment from evaluators, and multiple assessment;
- serving diagnostic, formative, summative, and certification purposes.

For each competence one or more assessment tools are proposed, with the aim of presenting a mixed-method assessment framework and obtaining multiple assessment measures. The assessment tools proposed to measure the selected entrepreneurship and social competences along with the respective templates and forms are shown in Appendix 1.

## 2.6. Practical instructions for assessment

When applying the assessment tools developed within the framework of the SOCCES project, one needs to be able to provide an answer to the following questions:

- What to assess first?
- Where to get started?
- How to learn to use the assessment tools?
- What should one know to get started?
- How should one get prepared for making the assessment ?
- How can one get started in using the assessment methods ?
- What are basically the practicalities in applying the assessment tools?

Depending on the goals of the assessment exercise and on the learning activities, teachers can choose to select a few or all the competences presented in the assessment framework. There is no best order to undertake the assessment tools.

Since the assessment methods proposed within the framework of the SOCCES project are mainly based on a mixed-method assessment framework, aiming at obtaining multiple assessment measures, the answers to the questions above cannot be generalized.

In fact, the assessment tools can be used as

1. Diagnostic tool – therefore being used before starting a learning path, in order to highlight the starting competence level of the class and give indications for the choice of dedicated teaching methods and contents
2. Formative tool – to be used during the learning path, in order to adjust the contents, methods, and strategies to make all students reaching the goals
3. Summative tool – to assess the final outcome of a learning process, and verify if goals have been achieved, also for certification purposes
4. Certification tool – to assess and certify the personal competences, as a standalone process

SOCCES has produced forms and templates for the assessment which are ready made to be distributed to students. When using the forms and templates, teachers should treat them as:

- Anonymous: if the teacher is not interested in linking the evaluation to the student (e.g., carrying out summary statistics on a sample)
- Non-anonymous: if the teacher is interested in linking the evaluation to the student (e.g., monitoring the progress over a certain learning path; or when the evaluation serves certification purposes)

## 2.7 Analysis and results

Once the teachers have received the documents back from the students as well as from the other teachers, who participate in the assessment process, an analysis is to be conducted on several levels, depending on the specific learning/educational context, namely:

- The individual level of the student (based on the assessment framework and the respective rubrics) together with recommendations for further improvement and learning exercises/educational courses to be undertaken/applied.
- A comparison analysis of the students to be found in the group/class (based on the levels of the rubrics of the assessment framework) in order for specific business challenges to be introduced.
- A pre- and a post- educational course/learning (business challenge) analysis on the initial and post-level (not end level since it is a dynamic process) with recommendations/tips for further improvement when and where necessary.
- In general, most of the tools propose both self-assessment and etero-assessment (e.g., peer- and teacher-assessment). Each tool provides indications and formulas about how to obtain the score (e.g., by summing and averaging the raw scores on all items on a certain psychometric scale). These scores can be applied back in the competence three-level (low, medium, high) rubric and apply them in the learning/education context one is to be found

## 2.8 Interpretation and feedback

The competences are evaluated according to three levels of mastery or expertise: low, medium, and high (for further details, see SOCCES project Report “Evaluating entrepreneurial transversal competences: An assessment framework”).

The interpretation and the feedback that the teacher needs to provide are largely context-dependent since the assessment tools provide the flexibility and the freedom to be used either within or outside a specific learning course/educational programme, thus being over-arching a specific set of an educational program.

If within a group learning environment with the objective of not only outcome-driven result but also process-based one, the teacher might choose to provide the results and the respective recommendations either on an individual or on a group level or have parts discussed only individually and parts definitely within the group. The learning objectives and the learning goals of the respective individual/group need to be leading for the decisions to be made by the teacher.

Moreover (taking into account the growth-mindset model used to develop the assessment tools), the feedback that needs to be provided has to have the form of an invitation for further improvement rather than an obligation for this to be explicitly needed or compulsory obliged.

As a suggested strategy, teachers can take into account that - whether feedback is just there to be grasped or is provided by another person - helpful feedback is (Wiggins, 2012):

- **Goal referenced:** Effective feedback requires that a person has a goal, takes action to achieve the goal, and receives goal-related information about his or her actions.
- **Tangible and transparent:** Any useful feedback system involves not only a clear goal, but also tangible results related to the goal. That is why, in addition to feedback from coaches or other able observers, video or audio recordings can help people perceive things that we may not perceive as we perform; and by extension, such recordings help us learn to look for difficult-to-perceive but vital information.
- **Actionable:** Effective feedback is concrete, specific, and useful; it provides actionable information. Thus, "Good job!" and "You did that wrong" and B+ are not feedback at all. One can easily imagine the learners asking themselves in response to these comments, What specifically should I do more or less of next time, based on this information? No idea. They don't know what was "good" or "wrong" about what they did. Actionable feedback must also be accepted by the performer, thus leading to action and not to controversy.
- **User-friendly:** Even if feedback is specific and accurate in the eyes of experts or bystanders, it is not of much value if the user cannot understand it or is

overwhelmed by it. Highly technical feedback will seem odd and confusing to a novice. Too much feedback is also counterproductive; better to help the performer concentrate on only one or two key elements of performance than to create a buzz of information coming in from all sides.

- **Timely:** In most cases, the sooner I get feedback, the better. Before one can say that this is impossible, remember that feedback does not need to come only from the teacher, or even from people at all. Technology is one powerful tool—part of the power of computer-assisted learning is unlimited, timely feedback and opportunities to use it. Peer review is another strategy for managing the load to ensure lots of timely feedback; it is essential, however, to train students to do small-group peer review to high standards, without immature criticisms or unhelpful praise (the assessment tools proposed within the SOCCES project are exactly oriented towards this goal).
- **Ongoing:** Adjusting our performance depends on not only receiving feedback but also having opportunities to use it. What makes any assessment in education formative is not merely that it precedes summative assessments, but that the performer has opportunities, if results are less than optimal, to reshape the performance to better achieve the goal. In summative assessment, the feedback comes too late; the performance is over.
- **Consistent:** To be useful, feedback must be consistent. Clearly, performers can only adjust their performance successfully if the information fed back to them is stable, accurate, and trustworthy. In education, that means teachers have to be on the same page about what high-quality work is. Teachers need to look at student work together, becoming more consistent over time and formalizing their judgments in highly descriptive rubrics supported by anchor products and performances.



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### 3. LEARNING ENVIRONMENTS FOR ASSESSMENT

We know little of the future working life although various studies concentrate on building pictures of it. The technological revolution is continuous and much of the technology that will be used in future is not yet available. Moreover, adoption of technology requires time.

Even though important advances are made in technology, humans hold important roles. No technology allows the artificial brain to replace humans in the capacity of thinking independently. Humans will be needed in business, management, innovation and development, marketing and sales. Photographers, musicians, painters and designers will be needed (Rouvinen & Pajarinen, 2014.)

In communication between humans the role of gestures, body language, way of talking and the person's private history play an important role. In this respect humans, will remain superior to machines even in the future and jobs where facing people is crucial like in medicine and nursing, safe jobs will remain available. Moreover, humans are needed in motivating others, which leaves working possibilities e.g. for teachers, educators, therapists. (Rouvinen & Pajarinen, 2014.)

Even though robots become increasingly performant, they cannot completely replace human senses and motorics in fields such as medicine and nursing. Rise of technicality of the society creates continuously new needs and new working opportunities. Humans remain behind all technical development and people are needed for innovating use for the new technology and then developing the technical solutions. At the same time people are needed in production, marketing, use, maintenance, recycling. Software architects, database designers and ICT-experts will be among the most secured jobs in the future. (Rouvinen & Pajarinen, 2014.)

Each euro used for development of technology, requires a tenfold investment in assurance of transition of human thinking patterns as well as human and organisational practices (Rouvinen & Pajarinen, 2014). In working life, control, compliance, and compartmentalisation (3 C's) are being outplaced by ideas, information, and interaction (3 I's) (Ketj de Vries, 2006).

The situations related to professional engagements are changing. Having a job does not mean holding the same role in the organization for ever. The recent financial crisis has shown that people have to adapt their role to the requirements of the organization. New tasks can be given at the same time as part of the previous ones may lose their importance. Many tasks disappear, will be taken care of by machines or will be outsourced. Taking over new tasks means facing new challenges, learning new skills, using new information, adapting to new working conditions and so on. As job markets change, individuals might have to change their working profile and learn a completely new profession. This can be based on the person's own initiative, as is often the case when the working conditions deteriorate considerably or through losing one's job. Many also wish to try a new profession, advance their career and experience new occupational challenges.

The following illustration gives an idea of the human qualities requested by business today (Figure 5).

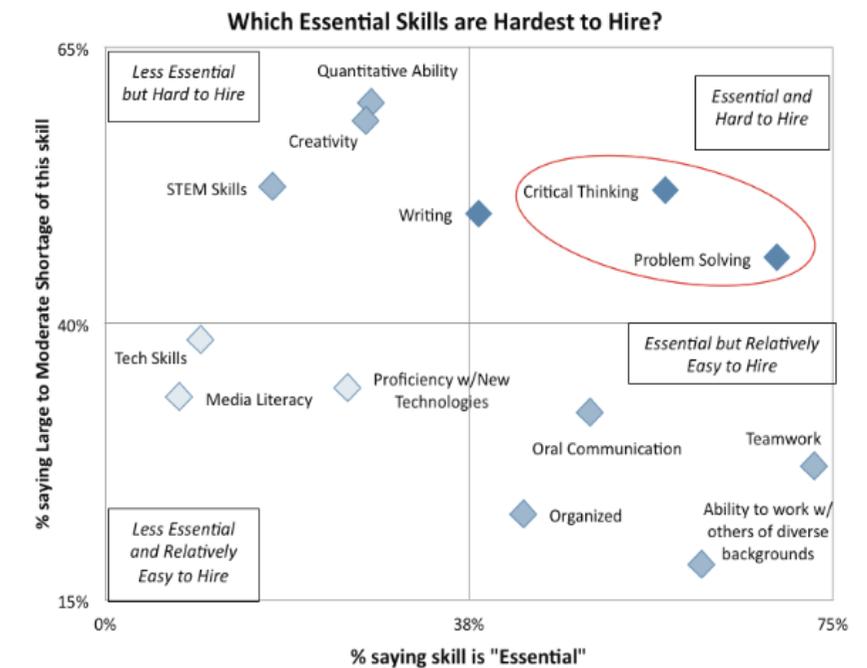


Figure 5. Human qualities requested for recruitment (Source: Molnar, 2015)

The illustration is based on the work of US Committee for Economic Development, a nonpartisan public policy group of business and education leaders committed to improving the growth and productivity of the economy. Information was collected by a survey which aimed at identifying the most needed skills in US business and the ones most difficult to find in the workplace. The illustration shows that critical thinking and problem solving in job applicants are the most essential, but hardest to find. (Molnar, 2015)

*“Graduates with today’s computer science skills, for instance, can find that their knowledge is outdated within two to three years.”* Working life has little possibilities of teaching workers to update their skills. Education should help students to become good citizens and good thinkers. Students need to be learn to evaluate their own skills and needs of learning, to learn, analyse, ask good questions, and do good problem solving. Critical thinking, problem solving, communication and the ability to work collaboration in teams and in networks with others of diverse backgrounds are among the most sought competences. (Molnar, 2015.)

Future challenges require the rethinking of teaching and learning approaches. This can include a transition from teacher to learner centred approach; shift responsibility for learning to the learner; offer team learning opportunities aside to individual work; replace pure memorizing by learning to find, critically evaluate, select and apply information.

The next chapter discusses the teaching and learning environments that can promote learning and expression of future working life, especially transversal competences and are suitable for their assessment.

### 3.1. Introduction

Future challenges require modernisation of teaching and learning approaches and involving elements such as:

- Transition from teacher to learner centred approach;
- Shifting responsibility for learning from teacher to the learner;
- Replacement of pure memorizing to finding, selecting, critically evaluating and applying information;
- Creation of collaborative learning opportunities aside to individual work;
- Evolution from theory centred approach to educational environments and methods where learning happens “in, through and for” authentic working-life challenges;
- Transition from monodisciplinary to multidisciplinary, interdisciplinary or transdisciplinary learning environments
- Integration of digital communication for promotion of collaboration and participation and avoidance of exclusion

### Learner centred teaching

According to various studies, teaching is today often still teacher centred, unilateral transmission of the teacher’s knowledge (lecturing) rather than facilitation of learning (Weimar, 2013 p.65). Instead of aiming at building a strong knowledge foundation, *“content should be used to build a knowledge base and to develop learning skills and learner self-awareness”*. (Weimar, 2013).

On the one hand, teachers find it difficult to limit their part in knowledge transmission as they consider that there is so much to cover and they possess the required knowledge. On the other hand, moving towards a learner centred approach sets the teachers in a new role, that of facilitators; open-minded and innovative applicators of modern educational environments and methods. For this, teachers have to accept that all teaching and learning situations cannot be planned in detail in advance; new things may appear that require adaptation to the situation. *“Teachers control less, but students are involved more”*. (Weimar, 2013 pp. 70-71.) Teachers may face uncomfortable situations but at the same time, they can also learn new things and develop as members of learning circles which now include not only teachers and learners but various working-life stakeholders.

Through the transition from teacher to learner centred approach, only teachers but also students find them in a new situation. In traditional educational environments, students’ passivity is a *“well-known and serious problem and because traditional methods of teaching have now been proven to exacerbate the problem”* (Weimar, 2013 p. 37). Through the transition students become responsible for learning, participate in determination of learning goals and hold an active role in the learning as well as in evaluating the learning outcomes. *“Students need practice in extrapolation and transfer of knowledge. Learning with others is more effective than learning alone and moreover, meaningful learning is facilitated by articulating explanations to one’s self, peers, or teachers”* (Weimar, 2013 pp. 40-41.)

Weimar (2013) presents seven principles that should guide the implementation of learner-centered teaching:

1. Teachers let students do more learning tasks, i.e. let them summarize, draw conclusions, pin point difficult areas in the reading, etc.
2. Teachers do less telling, i.e. get better at asking questions.
3. Teachers do instructional design work more carefully, i.e. create more in-class assignments that help students apply cognitive skills to relevant material.
4. Faculty more explicitly model how experts learn, i.e. are willing to share their own learning process and thought process in answering unexpected questions.
5. Faculty encourage students to learn from and with each other (self-explanatory).
6. Faculty and students work to create climates for learning. This is less fuzzy than it sounds. It is about e.g. giving students options so that they accept responsibility for their learning.
7. Faculty use evaluation to promote learning, i.e. use peer assessment and feedback as a point of departure for a discussion.

### Learning together with other students

People learn today in different ways than before. For example, understanding a certain content is socially constructed through conversations and communication about this content. Learning together with others helps students to identify their resources while also encouraging them to reach out to one another to solve problems. While building collaboration skills this also enables deeper learning and understanding.

Brown & Adler (2008) present the concept of social learning (see illustration 2). Students who study in groups, even only once a week, are more engaged in their studies, better prepared for class, and learn significantly more than students who work on their own (Brown & Adler, 2008).



This perspective shifts the focus of our attention from the content of a subject to the learning activities and human interactions around which that content is situated. The effectiveness of social learning is based on the interaction: students can create understanding through social interaction through discussion, asking and answering mutually and thus clarifying unclear issues, uncertainty or confusion. This approach transfers the goal from “learning about” to “learning to be” a full participant in the field. This involves acquiring the practices and the norms of established practitioners in that field or acculturating into a community of practice. (Brown & Adler, 2008). At the same time the integration of information available other than that offered by the teacher becomes essential as in real working-life. At the best students learn to search, critically evaluate and adopt information available from various sources such as libraries and internet. The open sources of various other educational institutes and research centres can become valuable complementary sources for discussion and knowledge creation.

A special case of social or collaborative learning is learning in teams through a collaborative learning task. This is the case described later in the business case.

A team is a small number of people who are committed to a common goal or purpose for which they consider themselves mutually accountable. Teams utilise resources (input), maintain internal processes (throughput) to produce specific outputs/products.

The success of a team or the “collective competence” consists of trust, commitment, communication and joint problem solving (Blomqvist & Levy, 2006). Successful team work enables students to develop and show pertinent communication, responsible interdependence, and psychological safety, as well as a common purpose and a clear understanding of roles and task. (Guilland, Harmoinen & Saloranta, 2014).

Team work requires a form and structure otherwise the team can’t work in an efficient way. Even if the team members say that they are operating in a good way without having an exact form or structure, it can be seen that only planned and decided rules and ways of acting assure achievement of the set goals. This necessitates also that teachers have to be aware of the proper ways of guiding teams to assure that students achieve the learning goals both on team and personal level. Attention must be focused on both learning of theoretical dimensions and reflective dimensions. (Guilland & al., 2014.)

Team members must be encouraged to estimate their own performances regarding both the objectives of team work and their own learning. Finally the competence of each individual to consider and self-assess his or her own work becomes a central starting point of team work and learning. It is also important that team work is sequenced so that it supports learning. Even if the team had a plan that seems to end up achieving the set goals, teams should be flexible and capable of changing practices, ways of working or develop the working atmosphere when necessary to assure learning by all team members. (Guilland & al., 2014.)

Self- and peer assessment are elementary parts of collaborative learning. The goal of peer-assessment is to generate feedback on student performances, to promote learning and engage students. Students learn to give and receive feedback from team members and revision it for planning further studies and assignment work. It is necessary that students interact and discuss the study content with peers to understand and connect the learning with what they already know. Through peer-assessment students reflect the criteria of desired performances and in this way it promotes the analytical process of learning. Both partners of peer-assessment work closely with the criteria which also increases likelihood of learning from peers. Peer-assessment can serve multiple purposes: assessment, learning, social control, learning-how-to-assess and for promotion of active participation. By learning to apply peer-assessment students become less dependent on the teacher, which can be very valuable also in the cases, when the teacher has limited time for guidance and support. Learning peer-assessment is a precursor for becoming a skilled self-assessor. (Guilland & al., 2014.)

### Learning in collaboration with working life

Due to improvements in communication and transportation, world has become increasingly "flat" challenging business through worldwide competition. The companies and areas that have the best answers to productivity and innovation are the winners. A well-educated workforce with competitive skills are the essence of such companies and areas especially if they can assure continuous learning and creation of new ideas. (Brown & Adler, 2008).

Business needs education but also education needs business for assuring learning of the most updated knowledge and skills. Worldwide organisations such as OECD but also European Council and local authorities in various countries have repeatedly stressed the need for stronger partnership between education and working world for enhancing learners' employability, entrepreneurial potential and familiarity with the working world. In this way, employers' knowledge and experience can be used, in the course of the learning process, to help each individual acquire the knowledge, skills, competences and positive attitude towards work that will support the student's chances of finding a suitable job or starting own business.

### Multi-, inter and transdisciplinary teaching

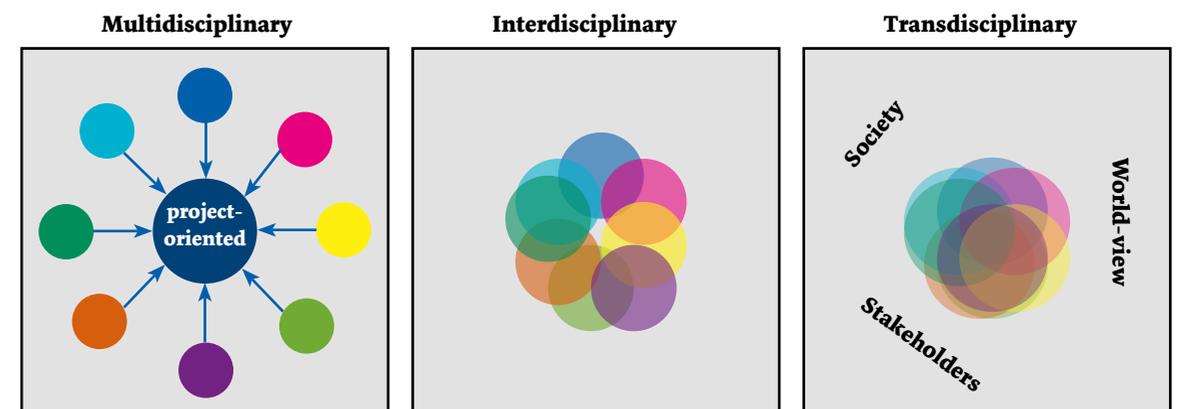
Multidisciplinary refers to a combination of various disciplines as independent and separate components of learning. "This allows students to work within discipline specific parameters and attain discipline specific goals." "In the case of team based learning in a multidisciplinary learning environment, students experience sharing communication more than collaborative problem solving." (Park & Son, 2010.)

An interdisciplinary approach expands the multidisciplinary process through collaborative communication. Interdisciplinary learning consists of more collaboration and interactions between disciplines. Learners are involved in solving problems beyond their discipline. This requires "an organizational support infrastructure that promotes work interdependence, increases self-management, and increases responsibility on

the part of team members for group performance and student outcomes". (Dyer, 2003; Park & Son, 2010.)

Transdisciplinary learning promotes efficiency of learning by giving value to the knowledge and skills of team members. This approach requires effective and frequent communication among team members. (Dyer, 2003.)

Transdisciplinarity comprises use of shared conceptual framework that draws together concepts, theories, and approaches from the parent disciplines. It particularly emphasises students' learning experience in sharing their skills and experiences (cross-training) and producing new knowledge. "True transdisciplinarity goes beyond simply drawing together concepts from the disciplines. It creates new frameworks that break down (transgress) the traditional boundaries of the disciplines. Team members must be competent enough in their own disciplines and understand the language of all relevant disciplines that enables them to contribute to the members' quality research or learning and combine various perspectives to build up a new framework." (Park & Son, 2010.)



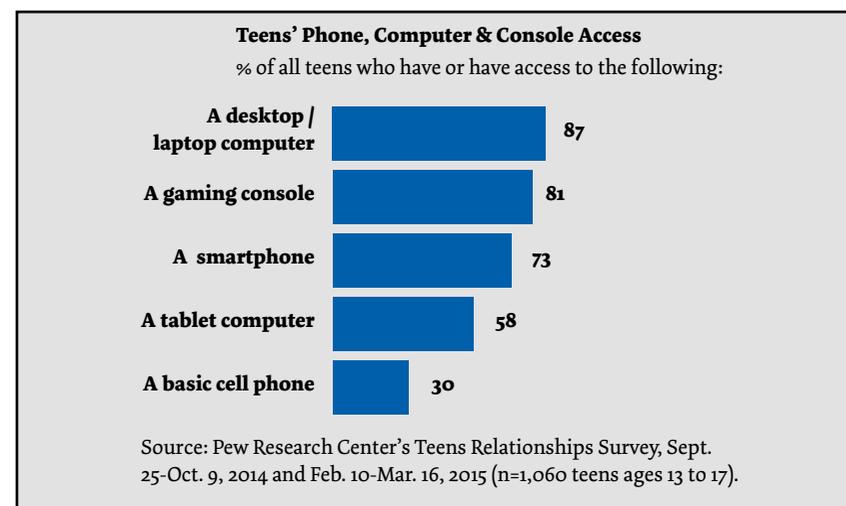
**Figure 6:** Three forms of integration of various disciplines and stakeholders in learning. Source: [https://nanohub.org/groups/howpeoplelearnnano/crossdisciplinary\\_nature\\_of\\_nanotechnology](https://nanohub.org/groups/howpeoplelearnnano/crossdisciplinary_nature_of_nanotechnology)

### Integration of digital communication in learning

At the same time enhancement of ICT-skills and ICT-based learning is crucial. Leading researchers, practitioners, administrators and policymakers from various countries underline the importance of an education reform through technology and social media.

Individuals have different intellectual profiles: linguistic, logical-mathematical, spatial, musical, bodily-kinaesthetic, interpersonal, intrapersonal and naturalist. Teaching methods should enable different learning paths to ensure equal chances for all learners.

Young learners today have grown up with computers and mobile phones and are regularly connected. According to recent studies, fully 87% of American teens (13 – 17yrs) have or have access to a desktop or laptop computer, and 58% of teens have or have access to a tablet computer. Moreover, 24% of teens go online “almost constantly,” facilitated by the widespread availability of smartphones. (Lenhart, 2015.) Therefore integration of ICT-based learning can offer multiple possibilities to learners and motivate them in a different manner than other working tools or sources of information. Young people have learnt to be connected and therefore use of ICT for working in teams or networks is not technically create a similar challenge as other generations that possibly do not all share the same experience of using various digital applications in daily life.



**Source:** Lenhart, 2015 p.8

The various digital possibilities in the form of internet, social media, and different digital applications enable creation of learning environments that motivate and encourage students and support in engagement in learning goals. Teaching and learning platforms offer favourable opportunities and conditions (a dynamic energetic atmosphere, created in an online class, in which learners interact and communicate with each other) for social learning by connecting a growing number of learners for participation in the process of creating and using content. These new circumstances lead to a changed culture of learning among peers.

#### **Learning IN, THROUGH and FOR authentic business cases**

Learning in a business case is a second step of social learning in groups. Learning happens in teams (and networks) around a collaborative assignment that is created in collaboration with business partners are represents a real working-life challenge.

In a business case a student team (or a network of teams) aims at solving an authentic working-life problem. Authenticity means that the learning process is based on a genuine development project carried out for working-life, which corresponds to the areas in which the students wish to become experts (Raij, 2007 p.22). There are various other forms of authentic learning models as described for example by Herrington & Herrington (2006) in their book *Authentic Learning Environments in Higher Education*. The book presents many examples from various disciplines on authentic learning tasks and guides teachers in building such.

The value of business cases compared to other type of authentic learning tasks, is that business case are based on authentic challenges of working life. They aim at supporting competitiveness of business and therefore need to bring together research, development and innovation for offering business partners new ideas and solutions. The next chapters describe creation of a business case based collaborative assignments for assessment and presents examples from the SOCCES pilot studies.

### **3.2. Business case framework**

Modern learning environments are interactive and offer development of communication. Multidisciplinary disciplinary and technology enhanced environments enable learning and expression of various competences. Modern teaching and assessment methods based on individual and team approaches can encourage the learners to take over an active role in their learning process. Working in collaboration with industry for developing solutions for their real challenges enables teaching and learning in working life, through real working life challenges and for working life.

Learning experience is more likely to have significant, positive gains for the learners if they are active rather than passive recipients within it. Learning in a passive system has a much greater tendency to be both superficial and quickly forgotten.

Business cases offer authentic challenges and support collaboration between various partners, working life, customers, research and education. This chapter aims at giving manifold information on building a business case, integrating it in education, planning the educational process, methods and tools.

#### **3.2.1. Planning the integration of a business case in other studies**

by Susanna Nieminen (Laurea UAS)

Learning of transversal competences is hardly ever possible isolated from practise. It is not enough to know about good communication or teamwork in theory. This knowledge is valuable only if one can apply it and act accordingly in real situations. Everyone needs a lot of practice to master these skills and for students this is a part of learning working life skills.

Teaching and learning transversal competences should be integrated in other learning activities. In principle, learning of almost any (practical and) substance specific topic can be blended with developing transversal competences. The only requirement is that in addition to theoretical and individual work students work together on practical tasks to solve authentic working life challenges. Basic prerequisites for such a task include e.g.

- Working in groups or teams
- Planning and executing a project to solve a real problem or challenge
- Applying theory into practise in authentic circumstances
- Diverse reporting and communication needs.

Some proven examples of topics that can be blended with learning of transversal competences include

- Understanding a phenomena
- Solving a complex problem
- Interpreting a difficult concept
- Developing a solution
- Planning a new service, product or part of it
- Creating of a business plan

Planning a learning environment and activities to assess transversal competences follows the general guidelines of planning a course with an authentic business case. It starts from analysing the learning objectives and planning the rough process for achieving them. The main parts to be considered include

### **1. Identifying the learning process with a business case to achieve the learning objectives**

The motivation to use a business case approach as a learning process must always arise from achieving the learning objectives. It would be good to make a preliminary plan of the assessment in this phase. This could include ideas on the purpose of the assessment; are there needs for formative assessment as well as for summative.

### **2. Finding a suitable business partner and agreeing on the roles and principles**

Finding a suitable business partner who is willing and able to work with the students is vital to the success of the project. It is always important to agree on the roles of the partner and discuss the expected outcome of the project so that the partner has realistic expectations on the project. The minimum interaction usually includes initial briefing (background information and description of challenge), support during the process (meetings, exchange of information) and feedback on final outputs. More face-to-face interaction usually means better understanding of the challenge and more applicable results to the partner.

### **3. Describing the business challenge**

It is important to have a written description of the challenge that serves as a common starting point and an expression of expected end result for the students. This document does not usually state the path to the solution but merely tells about the gap between the current state and the goal. How concrete and how in detail issues are described may vary considerably depending on stage of the students and the objectives of learning. This topic is discussed in detail in chapter 3.2.2.

### **4. Planning the business case process with intermediate steps and milestones**

The business case process imitates the process in real working life. Several model processes has been proposed in literature and can be used as part of learning process. In chapter 3.2.3 a so called Double Diamond model is presented.

### **5. Planning the detailed activities of learning, teaching, and guidance for each step**

In this phase the learning process is getting its concrete form as a series of learning events. Each event will be equipped with materials, methods and tools. Platform to best support learning is chosen and the assignments with outcomes are planned. In chapter 3.2.4 a collection of tools and methods that can be used in different phases of the process is presented.

### **6. Planning the assessment principles, procedures, and tools to comply with the learning objectives**

Information related to this issue is presented in chapter two (Assessment Methods, Templates and Forms). Various small assessment procedure) promoting reflection, discussion and immediate feedback are often more important than labourous assessment tests especially if they do offer students information on procedures for further development.

### **SOCCEs Pilot Project**

In the SOCCEs project a pilot testing of the assessment framework was carried out by using a business case as a learning environment. The pilot arrangements are reported in the end of each subchapter as an example to give an idea how a potential business case could be constructed.

City of Helsinki is building a new Central Library. Six student teams from four different universities and countries were asked to generate new roles for a future library.

#### **3.2.2. Description of the challenge**

The business case challenge describes the problem, gap or challenge that the business partner has presented. The challenge needs to be clarified in the form of a clear problem description that give a well reflected summary of the problem in such a form and language that the developers can tackle it. Joint discussions often precede

the documentation which in turn can and should be done together with the business partner and the developers to assure comprehensive but still clearly focused documentation of the challenge.

A minimum amount of background information on the business partner is necessary to be able to set the challenge in an appropriate frame. Such information can be considered to be the following: sector of industry, main services of the company, size and yearly turnover on the company, yearly sales of the product or service in question as well as the way in which the challenge has been tackled previously in the company.

A comprehensive business case challenge description could consist of the following elements (Table 2), though much of this complementary content can be collected by the developer team in the Discovery Phase.

**Table 2:** Elements of a Comprehensive Business Challenge Description

CASE COMPANY	CHALLENGE	BUSINESS CULTURE	STAFF/ EXPERTISE
FIELD OF ACTIVITY	DESCRIPTION OF THE CHALLENGE	HIERARCHICAL OR FLAT ORGANISATION	RELEVANT EXPERTISE
BUSINESS ENVIRONMENT/ COMPETITORS	BACKGROUND: THE ORIGIN OF THE CHALLENGE/ THE NEED TO BE TACKLED	READINESS TO ACCEPT NEW INNOVATIONS	WILLINGNESS TO CO-CREATE WITH THE USERS/ STAKEHOLDERS
BUSINESS PHASE: (GROWING, STAGNATED OR DECREASING)	PREVIOUS SOLUTIONS, THEIR STRENGTHS AND PITFALLS	WILLINGNESS TO INVEST IN A NEW SOLUTION	AVAILABILITY (TIME, NUMBER OF PEOPLE/ HOURS)
COMPANY SIZE (IN SALES VOLUME; IN STAFF; IN MARKET)	BUDGET FOR THE DEVELOPMENT WORK		CONTACT PERSON

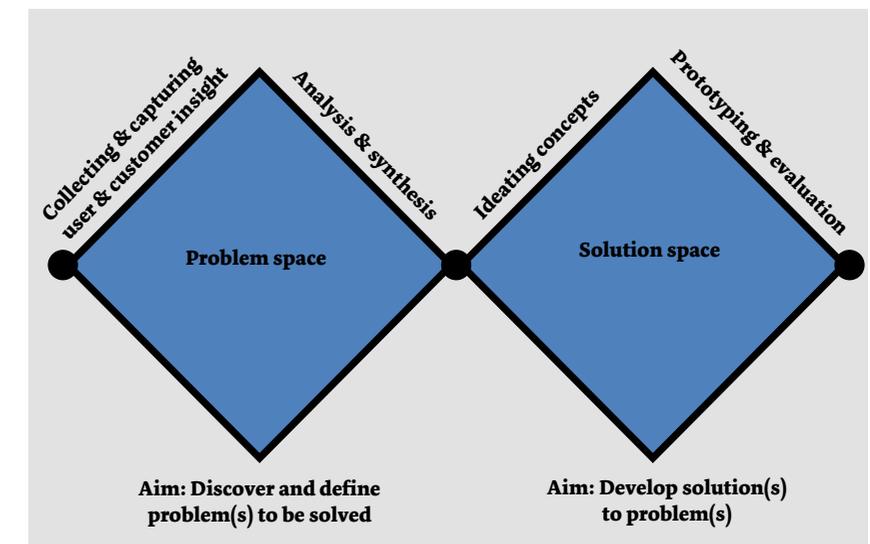
© Guillard

### SOCES Pilot Project

The business challenge description is presented in Appendix 2. We did not directly use the chart 2 to define the challenge but covered the main elements and ideas in the proposal. The rest of the information was gathered by the teams from the Library Project web pages. Since the pilot case was a public project intensely activating citizens much of the general information needed in the project was readily available in the Internet. This enabled the international approach and meant that no direct contact by the students with the contractor was necessary to complete the challenge. However, according to our experience at least one chance to discuss and pose questions to the customer would have improved the motivation and commitment of the teams. Also some feedback would have been beneficiary.

### 3.2.3. Business case process

British Design Council has developed a model for an innovation and development (or design) process. This so called Double Diamond model visualizes the various steps of development, innovation and design four steps (4 D's): Discover, Define, Develop and Deliver. (Design Council, 2005). Figure 7 visualizes the Double Diamond model. In this version presented by (Clegg, 2014) the illustration is completed by examples of the contents of each step.



**Figure 7:** The Double Diamond Model (source: Ari's Blog, 2015. Retrieved from: <http://stopandfix.blogspot.fr/2015/07/the-double-diamond-process.html>)

**DISCOVER:** An innovation or development process starts normally by identification of a challenge or gap or on the basis of a new idea. In the Define step the challenge, gap or idea is studied closer for creating understanding of the context and background and get introduced to the eventual previous solutions that have been developed to tackle the challenge and their outcome. Market and user study can be part of this step as well as an analysis of the existing solutions/services. An elementary part of the Discovery step is to take notice of the existing intellectual and financial resources and the available time.

**DEFINE:** The Define step enables to focus the development and innovation process on the basis of the information gathered in the Discovery step. In the Define step a project specific challenge is developed and the initial challenge is defined. To concretize the challenge it is useful to formulate clear questions describing the challenge. The questions should be simple what and how sentences that are closely related to the project specific challenge and complete each other (e.g. What is the solution to

the challenge like? What are the most important elements of the solution? What solution can be developed with the available resources?).

These questions are useful for focusing the development work. Moreover they enable in the final step to compare and reflect if the goals of the development process were achieved and to what extent.

**DEVELOP:** The Develop step is the one where the main creative, innovation and development activities take place. In this step collaboration with various stakeholders as well as the other development team members is of crucial importance. Several studies have proved that collaboration leads to effectiveness, which makes innovation possible. The power of collaborative actions and thinking is exponential to the power of working in a single manner either as a sole company or an individual (Blomqvist & Levy, 2006; Nieto & Santamaría, 2007; Taatila, 2009; OECD, 2010). Teambuilding activities enable to establish a team, get the teamwork organized and define each one's roles and tasks.

Workshops and various development methods facilitate collaborative activities in innovation and development. Many of these are quite well known, easy and low cost solutions such as Brainstorming, Brainwriting, Role Playing, 5 Hats etc. Several of these methods are presented in the following chapters.

**DELIVER:** Delivery step finalizes the development process. It can consist of final tests and finalization of the prototype, planning of the further development processes or production as well as other means of implementing and disseminating the results. In this phase the results of the previous steps are collected together and colated in a summarizing document, a written report and/or audio-visual documents.

Evaluation of the development process, self-and peer-evaluation of the team members as well as feedback from the customer are elementary parts of the Delivery step.

### SOCCEs Pilot Project

The implementation process in the pilot is described roughly in Figure 8. It follows the double diamond model and included weekly assignments (Appendix 3) and meetings. In addition to work in the teams, the students had to learn and comment other teams' deliveries and participate in two international webinars.

The project was completed in four weeks. Every week the teams were given assignments covering the main themes: 1) Team building and introduction, 2) Choose the challenge and present the plan, 3) Prepare a preliminary idea and 4) Deliver the final proposal. We had all the written material (assignments and some background material on methods etc.) on the Fairshare platform and thus it was the same for all teams. In addition, each teacher prepared his/her own material for the weekly meetings. So

## Helsinki City Library Pilot

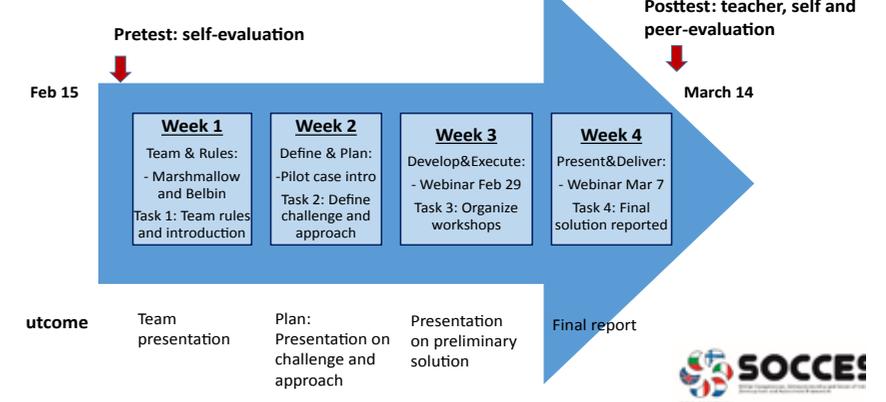


Figure 8: Business case process – SOCCEs pilot project

the guidance and preparation for the webinars was adapted by the local teacher to the class separately. This approach was chosen since the student teams had very different background and experience and they represented different disciplines.

Because of the limited time for the pilot the outcome was in the form of presentations or short reports.

### 3.2.4. Methods and tools

#### Teambuilding and Team Roles

A team is a limited, mostly a small number of people who share a common “purpose and goal for which they hold themselves mutually accountable”. Teamwork can be characterised by the use of resource (input), the processes (throughput) and the outcome (output).

To work efficiently a team must get organized, plan the work, guidelines for the working, timetable as well as each team members' tasks and roles. Planned and decided rules and ways of acting assure achievement of the set goals. Successful teamwork sets requirements on the organisational structure, individuals as well as the teamwork processes. (Mickan & Rodger, 2000; Guiland, Harmoinen & Saloranta, 2014). The following table presents elements of successful teams (Table 3).

Various methods are described in literature on building a team. Many of them suit for face-to-face teambuilding but also online games are available for virtual teambuilding such as the three easy methods for virtual team building presented by Osman (Osman, 2015).

**Table 3:** Characteristics of Successful Teams (Mickan & Rodger, 2000)

ORGANISATIONAL STRUCTURE	INDIVIDUAL CONTRIBUTION	TEAM PROCESS
CLEAR PURPOSE	SELF-KNOWLEDGE, (SELF-ASSASSMENT)	COORDINATION
APPROPRIATE CULTURE	TRUST	COMMUNICATION
SPECIFIED TASK	COMMITMENT	COHESION
DISTINCT ROLES	FLEXIBILITY	DECISION MAKING
SUITABLE LEADERSHIP		CONFLICT MANAGEMENT
RELEVANT MEMBERS		SOCIAL RELATIONSHIPS
ADEQUATA RESOURCES		PERFORMANCE FEEDBACK

Marshmallow Challenge is an easy, low-cost and very efficient teambuilding activity that can be used as well for children as for adults in working life situations. It enables participants to “learn profound lessons in collaboration, innovation and creativity”. “The task is simple: in eighteen minutes, teams must build the tallest free-standing structure out of 20 sticks of spaghetti, one yard of tape, one yard of string, and one marshmallow. The marshmallow needs to be on top”. (Anon.) The Marshmallow Challenge is described in detail in Appendix 6.

People may behave in various ways but the useful ways of behaving in a team can be classified in to a number of typical team roles as described by Belbin (2010). “The roles that people take in a team are seldom evident at all from their features or general appearance. That is why when a group of strangers meet for a purpose, much time is spent in probing, in weighing up each other, and avoiding getting down to real business” (Belbin, 2010).

Professor R. Meredith Belbin has developed a Team Role theory that is well known among managers and management trainers all over the world. Team players are categorized in nine (9) different Team Roles. Each person can identify themselves belonging to one or several role type. Getting teamwork organized requires distinct decision of the roles and tasks of every member. “The skills of the players are important but the strength of the team depends more specifically on how well the players combine.... Star players who fail to pass the ball are no longer an asset and may be dropped in favour of those who fin in best. In the high-performance team, each player knows when and where to enter and to exit.” (Belbin, 2010). The Belbin Roles and the instruction concerning the use of the method are presented in Appendix 7.

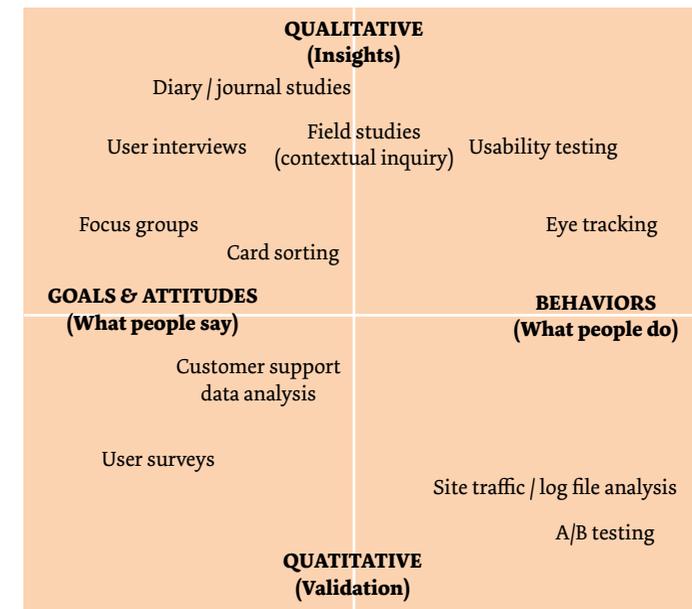
**Methods for the Discover Step**

Discover step can consists of various elements depending on the general knowledge of the developers on the issues. Some examples are presented in the list below:

1. Create general understanding of the phenomena. Read about the phenomena from various sources and critically evaluate the information to create a reliable picture.

2. Collect background information on challenge or gap to be tackled such as existing research data, company or service specific information, other statistics etc. from data banks. Both quantitative and qualitative information can prove to be necessary.
3. Elicit case and challenge specific information:
  - Observe, shadow and/or interview stakeholders such as staff and/or customers
  - Create understanding of the challenge precisely in this case

Figure 9 presents a general view of the available methodological approaches that can be used in collecting information in the discovery step. The choice depends much on the available resources but also on the goal and style of the study.



**Figure 9:** Different methods organized by goal and the style of study (Portigal, 2013)

A qualitative approach is useful when little or nothing is known about the issue. It answers to questions what and how. The quantitative approach gives information on the scale of the phenomena, how many people are concerned. It gives answers to questions such as how many, how often, how much.

What comes to the qualitative methods, various forms of observation and interviews such as shadowing or Gorilla Interviews offer quick and easy means of gathering information for creating a general picture of the situation and understanding the general context. Similar actions done on internet discussion groups or social media can be a rapid way of getting a general idea of the aspects that customers and end-users consider important related to the issue in question (Kozinets, 2015).

Appendix 6 presents examples of simple data collection methods and their use.

### Methods for the Define Step

In the Define step the work to be done in the Development step is planned. This can consist of the following elements:

- Determining project objectives
  - Defining research questions
  - Defining project limitations
- Determining project objectives
  - Project management
  - Timetable, roles, tasks,
  - Internal and external communication
- Choice of the development methods for the Develop step
  - What methods will be used in the Develop step?
  - How will the methods be used?
  - Practical issues: timing, participants, premises, materials (shopping) ...

A workshop organized by the team enables to tackle the issues. The roles and task of each team members are important in assuring an efficient planning session.

### Methods for the Develop Step

The Develop step can consist of the following elements:

- Collaborative workshop(s)
  - Ideation sessions
  - Collaborative and individual creation of new ideas and solutions
- Analysis of the results
  - Critical analysis of the results
  - Evaluation of need for eventual further development works
  - Summarizing and documentation
- Testing/simulation: Planning of adaptation of ideas in business case

Collaborative innovation and development methods presented in various books (e.g. Proctor, 2010) are in a key position in solving a business case. The following rather well-known, easy to use and low cost methods are described in Appendix 7:

- Brainstorming, Brainwalking and Brainwriting
- Role Play
- Visual triggers
- Reversals (worse idea, negatives to positives)
- Clustering ideas /Mindmapping

Steve Austin (COV), Margarita Todorova (VTU)  
& Sarah Wilson-Medhurst

## 4. VIRTUAL COLLABORATION

### 4.1 Support for collaboration

This section looks mainly at the support needed by students when engaged in online collaborative activities as part of the curriculum. It is assumed in this case that teams from more than one university are studying different modules (each at their own university) but have a collaborative exercise as part of all of those modules.

#### **Maintain good communication at the separate institutions**

Students require additional support for online collaboration, as many issues with the collaboration can arise. Good communication with your own students before and during the project offsets much of the frustration especially if the next tip is not followed.

#### **Maintain good communication with colleagues at the other institutions**

This can be particularly difficult to maintain as this is outside of lecturers' usual mode of working. However, as the students work closely together, any discrepancy between lecturers' communications to them soon becomes apparent and can undermine confidence.

#### **Identify a shared set of applications to which all students have access and can use**

The problems of different software being used by different students will occur even within the same country if different institutions collaborate. International working introduces additional challenges, since in some instances, even the same version

of the same application will be different in different countries (for example Excel files may need to have data imported, rather than simply opening the file). Solutions to this adopted by students are to default to the lowest common denominator i.e. simpler packages were often used at all locations, or files were saved in the earliest used version. On occasions, students will however recreate the same content in different packages, which is highly time-consuming. Ideally this could be an opportunity for all institutions to upgrade to the level of the most advanced of the institutions in the collaboration.

#### 4.1.1. Skills for Synchronous Collaboration

The skills needed for successful synchronous online collaboration are additional to those, which are routinely used in offline team working. The following guidance points focus on making the students aware of the basic norms of behaviour that can be adopted in online meetings. Some of the skills may be seen at first to be self-evident, but experience suggests that students are often unaware that they need them at the start of the collaborative process - and sometimes have failed to acquire them by the end.

Some of these behaviours should be regarded as essential as they are necessary in order to meet the inclusivity and equality protocols of institutions, and it is appropriate to inform the students that they must be used when interacting with each other. The essential behaviours are indicated below.

- Tell students how to communicate clearly in virtual meetings, i.e. to reflect on comments by others, to clarify meaning and to specify (or make explicit) when action points have been established.
- Tell students to keep minutes of items discussed, particularly action points, and share these.
- Explain to students about time zone differences and how to develop experience at working these out.
- Make students aware of the necessity for punctuality and regular attendance
- Encourage students to identify a schedule of meetings that take all of the competing demands and time zone differences into account
- Indicate to students that the use of asynchronous and synchronous communication should be used in conjunction, with the different media being used for the appropriate purpose.
- Tell students not to break off for private conversations during a videoconference.
- Inform students about the skills for synchronous communication that supplement face-to-face behaviours in order to compensate for less physical presence.
- Tell students to chair meetings so that only one person speaks at the same time and all get a chance to speak (essential).
  - Tell students to plan and structure meetings.
  - Tell students to set up their equipment so that there is no echo (essential).
- Inform the students that they must take into account students with disabilities (essential).
- Tell students not to hold the meeting in unsuitable areas (essential).

- Ask the students to reflect on developing fluency in using the software
- Inform the students that they need to be conscious of other's lack of awareness of their presence
- Tell students to have information to back up their statements
- Tell students that this information needs to be placed on screen
- Suggest that they use web cameras to support their online interactions.
- Let the students know it's OK to modify each other's work and to use track changes (or similar facility) when do so

#### 4.1.2. Selecting a Suitable Topic or Problem

Not every topic or problem is suited to 'residing' in a virtual collaboration environment. Collaboration can be defined as 'the situation of two or more people working together to create or achieve the same thing'<sup>1</sup> and requires a topic or problem that meets certain criteria. When that collaboration process is facilitated virtually there are also additional technological considerations to ensure participants can 'sit down' together online and have a productive 'conversation'. However, beyond these technological preconditions, the topic or problem itself should meet certain criteria to promote and facilitate collaborative working:

- Sufficiently open-ended to give opportunities to 'brainstorm'
- Draw on the different knowledge and expertise of the team members
- Focus on enhancing problem-solving and critical thinking skills
- 'Real-world' or related to 'real-world'
- Value diversity
- Create a visible necessity to work in this way - promoting creative thinking, team members' relationships and efficiency whilst at the same time utilising technology for effective interactions in the virtual space

The above list of criteria is not intended to be exhaustive, rather a minimum requirement.

#### Pre-processing the selected topics

It is recommended certain actions are undertaken before the topic or problem is 'activated' in the virtual collaboration environment:

- Assuming an initial "face-to face" meeting isn't viable have a team 'ice-breaker' activity
- Create the specific team rules and (flexible) norms
- Build trust and promote open communication
- Identify the cross-cultural interpretations of the topic or problem in hand
- Preliminary identification of group goals for discussed topic

Preliminary and preparation activities are very important for the successful establishment of virtual collaboration environment.

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<sup>1</sup> <http://dictionary.cambridge.org/dictionary/english/collaboration>

### 4.1.3. Unique challenges of virtual collaboration environment

In the virtual collaboration environment it is more difficult to get virtual teams to bond, harder for informal leaders to emerge, more challenging to create genuine dialogue, and easier for misunderstandings to escalate.

It is also important to pay attention to the additional complexities that arise during the establishment of the virtual collaboration environment:

- scheduling meetings around international times zones and holidays and conducting meetings in a language that for many participants is their secondary one
- dealing with an array of cultural issues that can include differences in communication protocol, decision-making, dealing with authority, the concept of time, negotiation styles, and the emotional reactions allowed.

## 4.2. Virtual platforms and tools for collaboration

### 4.2.1. Introduction

A large and growing body of literature has investigated different aspects of online collaboration and presented many case studies of on line collaborative projects in the variety of disciplines such as engineering (Maury-Ramírez, et al. 2008) and product design (Sclater, et al. 2001). Much of the research is focused on introducing students to concepts of team working in on-line environments, but the findings of some studies suggest that on-line collaborative projects encourage greater student engagement and therefore encourage development of skills and competences such as openness, dialogue, reflection, participation, understanding, co-operation and compromise (McMahon & Bhamra 2012). The challenges reported in majority of the case studies revolve around different aspects of communication, which can be broadly split into technical and social barriers to communication (Sclatter & al., 2001). Whilst technical difficulties can be relatively easily overcome, some social barriers can be more challenging. Overcoming barriers created by what students' learnt in their own cultural and professional setting can create a particular challenge for encouraging and facilitating collaboration (Cumming & Akar, 2005).

The following guidance notes are written for educators who are contemplating, or about to implement, a collaborative project within their programmes of study, involving international partner(s).

### 4.2.3. Platforms for collaboration

In the SOCCES project, students were free to use whichever platforms they wished for their asynchronous working and synchronous meetings but were required to use 'Fairshare' for the on-line repository and virtual platform. However, when establishing a virtual environment it is important to note that students will use a variety of platforms to undertake the project, i.e. use email for lengthier communication, other forms for sharing and storing information, like Dropbox, and other forms of communication that required a faster turnaround, like Facebook, Whatsapp.

#### **Ensure that the platform is effective**

Ensure the virtual platform has the functionality that the students require for conducting meetings, i.e. face to face communication, synchronous capability, file sharing, video capability, audio capability.

#### **Impose a minimum standard for hardware for video conferencing**

Students should use good microphones, good web cameras and make sure they have a good internet connection.

#### **The Wi-Fi availability in universities is sometimes substandard**

In the majority of institutions the internet connection is of sufficient quality. However, be aware that facilities may in places be substandard and identify these areas. Ideally the project can be a means to highlight deficiencies in the IT provision in institutions.

#### **Ensure compatibility between the software the different institutions are using**

Learning from each other regarding the software used by other disciplines and institutions is a valuable opportunity of collaborative projects, however this needs to be anticipated in order to effectively encourage this aspect. The practicalities are that, where this is not done, students will be forced to use the lowest common denominator between their available packages, or waste time redoing work. Ideally the latest version of the software should be chosen and disseminated to all students, as the most recent version.

#### **Be aware of the specific affordances and constraints of the technologies the students will be using**

The table below describes the experience of students at Coventry University with regards to various technologies used for online meetings.

	USED FOR	WHY USED?	CHALLENGES WITH USE
FAIRSHARE/ OPEN MOODLE	COURSE DOCUMENTATION, SUBMISSIONS, FORUMS	VLE PLATFORM FOR ACCESS TO DOCUMENTATION LINKED TO THE PROJECT	SEEN AS THE REPOSITORY FOR ALL DOCUMENTATION LINKED TO THE STUDENT PROJECT, BUT NOT USED FOR COMMUNICATION.
DROPBOX/ GOOGLE DOCS	FILE SHARING AND ORGANISATION. KEEP TRACK OF WORK COMPLETION. SINGLE PORTAL FOR WORK STORAGE. USED FOR SHARED STORAGE SPACE AND ALL ACCESS TO FILES.	FREE. EASY. EVERYONE USES IT, KEEPS TRACK OF WORK. GOOD FOR "LIVE" DOCS.	WRONG FORMATS. GOT BUSY/ CLUTTERED. DROPBOX GOT FULL. NOT EVERYONE USED IT. NOT ENOUGH STORAGE SPACE. 2 PEOPLE EDITING ONE DOCUMENT SIMULTANEOUSLY
FACEBOOK, WHATSAPP	EVERYTHING: FILE SHARING, WORK UPDATES, PROBLEM-SOLVING, GENERAL ARRANGEMENTS.	EASIEST PLATFORM. MANY PEOPLE USE IT ALREADY.	PEOPLE NOT USING IT ENOUGH. PEOPLE READING COMMENTS BUT NOT RESPONDING. NOT PROFESSIONAL.
GOTOMEETING	MEETINGS: PROBLEM SOLVING, DESIGNING – SKETCH UP, UPDATES. HOSTING MEETING.	SYNCHRONOUS MEETING.	LAGGING. VISUAL ISSUES. SOUND ISSUES – FEEDBACK. SCREEN SHARE LAG. CONNECTION/ SPEED ISSUES. ECHOES. POOR USE DUE TO NOT KNOWING IT. MADE COMPUTER CRASH. GOOD BUT DETERMINED BY STRENGTH OF CONNECTION. WHEN TWO MEETINGS WERE ARRANGED SIMULTANEOUSLY CAUSING CONFLICTS. DETERMINING THE HOST.
WORD	USED FOR WRITING REPORTS	REPORT WRITING	SLOW OR CRASHES WITH DOCUMENTS OF THAT SIZE
EMAIL	COMMUNICATION	ASYNCHRONOUS COMMUNICATION	TIME DIFFERENCE FOR RESPONSE TIME (AWARENESS)

### Let students “try before they buy” with the videoconferencing platform

One common comment by students about virtual meetings is; that meetings would be more effective if there was a preparatory period of trial sessions and tutorials (described as “try before you buy it!”). This is important and needs to be planned into the course or module delivery schedule.

### Be aware that videoconferencing presents particular challenges for some students, that is, those who feel the absence of face-to-face social cues more keenly

Suggest that they use web cameras to support their online interactions. Multiple monitors can be used; one for holding web-camera images to support online presence, another for the applications being observed. Some students will always report dissatisfaction with meeting using video-conferencing, even if no, or few, technical problems are encountered. This is usually less of a problem with self-selected participants, though some may not be aware of this antipathy before they start. This is not usually a reflection on the type of platform selected, it is due to the mode of meeting being online. These are often students who are particularly adept at reading body language and managing face-to-face interactions, so feel the loss of their usual advantage when in an online environment. A fraction (usually estimated at about 25%) do not experience the sense of projected presence that is usually enabled through technology. Using web cameras may make some students more self-conscious however.

### 4.2.3. Skills for online collaboration

This section looks at the skills the students learnt to apply when moving to an online environment. Many of these appear to be general skills that would need to be used in any collaborative activity. However, although most students will have worked in teams before, few will have had experience of virtual team working before beginning a project. It therefore needs to be noted that, even if students are familiar with offline collaboration, many of these skills will need to be acquired when they move to an online environment. Also in reality, most of the challenges that come with inter-institutional and international collaboration are introduced at this point.

### Encourage students to develop a positive attitude towards communication

Effective communication is the most important of the collaborative skills students display. This is actually a newly required skill for them all as it only became vital for them on virtual projects due to the online nature of the collaboration. In their previous (face-to-face) projects communication happened ad hoc and regularly. When emails and Facebook posts were responded to quickly students develop a good working relationship and stronger mutual respect and social commitment to each other. It is recommended that staff intervene quickly where students are failing to respond to communications, as this is the biggest source of frustration, particularly failures to respond to emails. Failure to provide work is also cited as a cause of annoyance, though if communication was in place to warn of impending difficulties and find solutions, the annoyance was mitigated. Claiming work was done when it wasn't is

a particular source of contention. Once team members fail to communicate, then there is an absence of trust which is very difficult to overcome.

**Encourage students to develop schedules for completing tasks and ensure enough time within them**

Although many collaborations are managed successfully without planning interim deadlines and workflow timings, the absence of these does present difficulties for some students. Very few students incorporate these into their project planning and need to be guided to do so.

**Prepare students for cultural differences when working outside of institution**

As with the interdisciplinary cultural differences, cultural differences due to working across institutions or internationally present few problems for students and can even become a source of humour and camaraderie between them as they jointly develop an understanding and appreciation of differences. Cultural differences can be due to:

- The different ways of working at different institutions
- Different ways of being taught at different institutions which can influence knowledge and practice.
- Different terminology in different countries.

**Tell students to be flexible about the platforms used for communication**

When team mates do not respond to email, students can switch to Facebook and other forms of communication to try and get a response. Main technologies used can be DropBox, for collating files, Facebook for asynchronous communication and GoToMeeting for the synchronous meetings.

**Explain to students how to delineate usage of different platforms for different uses**

Students display high digital literacy in identifying particular platforms for particular usage. For example, using Dropbox for storing and sharing information, emails for lengthy communication, Facebook for rapid communication, such as arranging meetings. Identifying the best technologies for different functions and maintaining divisions between the different uses is a skill that effectively supports collaborations and which nearly all students display from the start.

**Inform students that collaboration is more effective if social media are used to build up group cohesion**

Social media, typically Facebook can be used by students to facilitate constant communication. It leads to fast turnaround time for messages, and also, if personal information is also exchanged, help build up camaraderie between the participants, which also develops trust.

**Explain to students that online storage of files, using a platform such as DropBox, also requires attention to curating and version control**

The students will probably generate a large number of documents. This can quickly become overwhelming unless time is spent organising the documents into folders and jointly developing a filing system. A jointly understood file naming system is also important. Making sure all the most recent content is the form that team members access, and older versions are archived is also vital. It helps if a shared dating system is also used and adhered to by all, and dates are added to filenames in the correct format. The international metadata standard for dates is YYYY-MM-DD. It is helpful if each team allocates the responsibility for monitoring this to a team member (which can be on a rotation basis).

**Warn students to be aware that students in other institutions will use different applications for creating content, and even different versions of the same application.**

These issues will occur even nationally across different institutions. International working introduces additional challenges, since in some instances, even the same version of the same application will be different in different countries (for example Excel files may need to have data imported, rather than simply opening the file). Solutions to this adopted by students are to default to the lowest common denominator i.e. simpler packages are often used at all locations, or files were saved in the earliest used version. On occasion, students even recreated the same content in the different packages, which was highly time-consuming. Ideally, this could be addressed at the level of support for collaboration, as the academics identify a set of shared applications to be used across the institutions. If this is not possible, encourage students to see this challenge as an opportunity to learn from each other about the software they use.

Hervé Chappert & Thuy Seran

## 5. CONFIDENTIALITY AND IPR ASPECTS

### 5.1 Introduction

Confidentiality, IPR (Intellectual Property Rights) and publication aspects are considered in different ways in each European country. The European Commission works to harmonize laws relating to industrial property rights in EU countries but this harmonization is not active now. You need to understand how they are handled in your country. When you do a partnership for a business case you need to consider IPR, Confidentiality or Publication aspects.

**On the EU level, there is two main organizations in charge of these aspects:**

- The Court of Justice of the European Communities mostly gives preliminary rulings on the interpretation of IPR directives
- The Court of First Instance (CFI) handles competition cases and appeals on the decisions of the Board of Appeal of OHIM (Office for the Harmonization of the Internal Market).

Videos to be watched:

<https://www.youtube.com/watch?v=EQsZf2G4Sdc>

<https://www.youtube.com/watch?v=sMos5Dx-9CQ>

### 5.2. Intellectual Property Rights aspects

The protection of intellectual property is important not only for promoting innovation, creativity, and improving competitiveness but also to make our students work in a confident environment when we are dealing with Business Partners.

Intellectual property rights (IPR) can be divided in two categories:

- Author's right or copyright with its neighbouring rights
- Industrial property rights (patents, utility models, trademarks, trade names, designs, etc.).

IPR are protected by international, regional and national law. In this legal and practical framework, however, the transfer of ownership and the conditions of use are usually determined by contracts. In business world, much of this is regarded as trade secrets, so the employed researcher must also sign a non-disclosure agreement (NDA).

Each university, research institute and company has its own way of dealing with IPR. They may have their own IPR strategies, guidelines and conditions attached to the employment contract. In joint projects, also university researchers may need to sign an NDA.

#### **Points to consider:**

After the preliminary contact is established with the firm and once the "idea" of the case have been determined, one of the next steps is to secure the cooperation of two categories of people:

1. Those who will be directly involved in the collection of data;
2. Those who have the power to authorize publication of the case.

These two categories are often merged into one. For example, if the case focuses on a firm and if the data collection requires conducting interviews with the firm's leader in addition to accessing internal corporate documents, the leader will be both the interview respondent and the person authorizing publication of the case. However, it is not always the case that respondents also have the authority to approve a case's publication. For example, if the case focuses on project management and involves observing and interviewing members of a project team within a firm, who should sign the official publication authorization? Any member of the team? All members of the team? The team leader, if there is one? The head of the firm? The director of communications and public relations?

There is no simple answer to this question. It depends on several factors, including:

**1. Do the respondents involved in data collection have middle - or upper-management status?**

If the answer is yes, we can assume that they are authorized to act “on behalf of their organization” and that they can personally authorize publication of the case. Otherwise, it will likely be necessary to obtain the authorization of a manager or company executive in addition to the consent of the individuals who participated as respondents.

**2. Does the case deal with a theme or a delicate situation that could harm the reputation or competitiveness of the individuals or companies involved?**

If so, it is crucially important to clearly determine, jointly with the individuals and the company, the terms and conditions for the writing and distribution of the case, in particular as regards the potential anonymization and masking of data.

**3. Can the names and some data be easily disguised in order to make it impossible to identify the firms or individuals, but without compromising the proposed teaching objectives?**

If the data can be easily masked without affecting the teaching objectives, it is generally recommended that this be done, as it can greatly help reassure respondents and firm leaders. However, in many management cases, it is impossible to remove all identifying elements and, in some cases, using the company’s real name (although this is rarely the case for individuals) and actual data is indispensable to meeting the teaching objectives. In such cases, these conditions must be clearly established in advance with the firm and the individuals involved in order to avoid the possibility of the company changing its mind later.

Virtually all professors who regularly produce case studies have encountered this type of frustrating situation where, after investing a great deal of time and energy to produce a case, they discover that it will never be used or published because the individuals involved refuse to sign the publication authorization. It is therefore important for case authors to minimize the chances of this happening. The first contact with the individuals or firms thus involves first confirming that there is suitable “material” present to produce a case and, second, ensuring the collaboration of potential respondents and of the person who will sign the case publication authorization.

### 5.3. Confidentiality Aspects

Confidentiality agreements (also called nondisclosure agreements, confidential disclosure agreements, and secrecy agreements) are contracts that govern the disclosure of confidential information by one party (the disclosing party) to another

party (the receiving party). These agreements can be very useful for researchers and organizations. However, it is important to understand their scope of application, as well as the provisions commonly seen in these agreements.

The disclosure may be unilateral, bilateral or multilateral. Confidential information disclosed in a confidentiality agreement might pertain to scientific research results and data, chemical compositions and formulas, software development information, recipes, laboratory methodology, and manufacturing techniques trade secrets (in the form of valuable know-how and/or show-how). A confidentiality agreement can either stand alone or be included as part of a broader agreement.

#### What are confidentiality agreements for?

It serves three purposes:

1. Alerts the receiving party to the confidentiality of the information to be received.
2. Specifies the responsibilities required of the receiving party.
3. Can be used as evidence in subsequent patent processing

Fulfilling a contract of confidentiality is essential to the trust relationship between University and partners.

### 5.4. Publication aspects

#### Case Studies

It is important to note that the rules of research ethics that govern the collection of data require the informed consent of all participants at the time of data collection.

If you are planning to use data gathered during the production of a teaching case, it is therefore essential to inform the respondents and to ensure that the data collection complies fully with the rules of research ethics.

Once the author is satisfied with the first version, it can be sent to the persons concerned for approval, notably the person responsible for signing the publication authorization.

In some cases, the respondents or person in authority may ask for changes to be made to the case or they may have comments or wish to provide new information that the author can choose to include in the case. At this stage, it is a good idea to ask the person in charge to sign the authorization for publication of the case.

## 6. SUMMARY

This handbook presents the work delivered by six European partner during years 2015-2017 in the context of a Erasmus funded project. The need to undertake the work was clearly justified by the need experienced in higher education. New methods and tools are required for assuring quality education which offers students means of preparing for the challenges working life presents today and in the future. Creating an assessment method for modern working life competences requires deep theoretical understanding of assessment together with practical knowledge of teaching and learning. In this respect the consortium that was built for the project was extremely complementary and offered deep expertise and vast knowledge.

The handbook covers the issues that were relevant in developing assessment and creating a framework for assessment of specific working life competences. It also gives information on the pilot where the assessment methods were evaluated and their usability tested. The learning environment is an essential part of the developed framework and therefore it is described in a manner that should help teachers to get ideas of the changes required and the means of adapting them.

The handbook is not meant to provoke scientific debate but rather present with scientific justification the work done for developing assessment of entrepreneurial competences. Moreover, the work is not finished and further development work has already started. One essential aim in the next step is to develop the usability of the assessment methods for obtaining rapid results for assuring clear and constructive feedback to students. This is elementary for encouraging students and guiding them in the learning process.



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# APPENDIXES

## APPENDIX 1: SOCCES ASSESSMENT FRAMEWORK FOR ENTREPRENERIAL TRANSVERSAL COMPETENCES: LEVEL OF COMPETENCE

AREA OF COMPETENCE	SPECIFIC COMPETENCE	LOW LEVEL	MEDIUM LEVEL	HIGH LEVEL
POSITIVE ATTITUDE AND INITIATIVE	SELF ASSESSMENT	DOES NOT RECOGNISE HIS/HER OWN STRENGTHS AND WEAKNESSES	RECOGNISES A FEW OF HIS/HER OWN STRENGTH AND WEAKNESSES BUT CANNOT FIND IMPROVEMENT STRATEGIES	IS AWARE OF HIS/HER OWN STRENGTHS AND WEAKNESSES AND CAN FIND IMPROVEMENT STRATEGIES.
	GROWTH MINDSET	BELIEVES THAT INTELLIGENCE IS STATIC; DOES NOT APPLY FOR IMPROVEMENT; AVOIDS EFFORT, CRITICISM AND CHALLENGES AND FEELS THREATENED BY THE SUCCESS OF OTHERS.	CONSIDERS INTELLIGENCE BOTH STATIC AND DYNAMIC; SOMETIMES APPLIES FOR IMPROVEMENT; CAN AFFORD A FEW EFFORT AND MODERATE CHALLENGES; DOES NOT CARE ABOUT CRITICISM AND THE SUCCESS OF OTHERS.	BELIEVES THAT INTELLIGENCE IS DYNAMIC; APPLIES FOR IMPROVEMENT; SEES EFFORT AS A PATH TO MASTERY; EMBRACES CHALLENGES, LEARNS FROM CRITICISM; FEELS INSPIRED BY THE SUCCESS OF OTHERS.
	EMOTIONAL INTELLIGENCE	DOES NOT RECOGNISE EMOTIONS AND THEIR IMPACT ON HIM/HER SELF AND ON OTHERS	RECOGNISES EMOTIONS AND THEIR IMPACT ON HIM/HER SELF AND ON OTHERS	RECOGNISES, GIVES VALUE AND MANAGES EMOTIONS AND THEIR IMPACT ON HIM/HER SELF AND ON OTHERS
	PERSEVERANCE	ABANDONS AN ASSIGNMENT WHEN TIRED OR UNDER DISTRACTION; ABANDONS A TASK WHEN EXPERIENCING FAILURE; DOES NOT WORK WITH CLEAR GOALS.	RISKS TO ABANDON AN ASSIGNMENT WHEN TIRED OR UNDER DISTRACTION; RISKS TO ABANDON A TASK WHEN EXPERIENCING FAILURE; DOES NOT ALWAYS WORK WITH CLEAR GOALS	FINISHES AN ASSIGNMENT EVEN IF TIRED OF; KEEPS ON WORKING IN A CONCENTRATED WAY EVEN IF THERE IS A DISTRACTION; CONTINUES WITH THE TASK EVEN AFTER A SETBACK OR FAILURE; WORKS WITH CLEAR GOALS
	COPING STRATEGY	CANNOT FIND WAYS TO COPE WITH DIFFICULT SITUATIONS; DOES NOT SEE GROWTH POSSIBILITIES WHEN DEALING WITH DIFFICULT SITUATIONS; CANNOT CONTROL REACTIONS; CANNOT ASK FOR HELP.	CANNOT ALWAYS FIND WAYS TO COPE WITH DIFFICULT SITUATIONS; DOES NOT ALWAYS SEE GROWTH POSSIBILITIES WHEN DEALING WITH DIFFICULT SITUATIONS; CAN CONTROL REACTIONS ONLY IN SOME CASES; CAN ASK FOR HELP ONLY UNDER CERTAIN CONDITIONS.	LOOKS FOR CREATIVE WAYS TO ALTER DIFFICULT SITUATIONS; BELIEVES THAT POSITIVE GROWTH IS POSSIBLE WHEN DEALING WITH DIFFICULT SITUATIONS; CAN CONTROL REACTIONS; ASKS FOR HELP WHEN NEEDED.

AREA OF COMPETENCE		LOW LEVEL	MEDIUM LEVEL	HIGH LEVEL
COMMUNICATION AND INTERACTION	GENERAL COMMUNICATION	IS NOT AWARE ABOUT THE COMPONENTS OF COMMUNICATION (VERBAL, NON VERBAL AND PARAVAERBAL); DOES NOT LISTEN AND DOES NOT UNDERSTAND MESSAGES SOMEONE IS SENDING; CANNOT SEND CLEAR AND CONCISE MESSAGES TO OTHERS.	IS PARTIALLY AWARE ABOUT THE COMPONENTS OF COMMUNICATION (VERBAL, NON VERBAL AND PARAVAERBAL); PARTIALLY LISTENS AND UNDERSTANDS MESSAGES SOMEONE IS SENDING; CAN SEND CLEAR AND CONCISE MESSAGES TO OTHERS ONLY IF A FEW CONDITIONS ARE SATISFIED.	IS AWARE ABOUT THE COMPONENTS OF COMMUNICATION (VERBAL, NON VERBAL AND PARAVAERBAL); LISTENS AND CORRECTLY UNDERSTAND MESSAGES SOMEONE IS SENDING; ALWAYS SENDS CLEAR, CONCISE MESSAGES TO OTHERS.
	INTERACTION	HAS MARKED DIFFICULTY IN KEEPING UP WITH THE DISCUSSION AND CONTRIBUTES ONLY OCCASIONALLY.	KEEPS UP WITH THE DISCUSSION AND CAN JUSTIFY AN OPINION; RESPONDS AND INTERACTS ADEQUATELY WITH OTHER SPEAKERS; USES COMMUNICATION STRATEGIES WELL WHEN UNSURE ABOUT (E.G., IDIOMATIC USE).	CAN PRESENT IDEAS ARTICULATELY IN A COMPLEX DISCUSSION; CAN USE SOPHISTICATED ARGUING AND TURN-TAKING STRATEGIES; HAS NO DIFFICULTY IN UNDERSTANDING IDIOMATIC LANGUAGE USE OR DIFFERENT REGISTERS
	PRESENTATION	STRUCTURE LACKS COHERENCE. SPEAKER UNFAMILIAR WITH TOPIC. TRANSITIONAL ELEMENTS LARGELY MISSING.	EVIDENCE OF A STANDARD THREE PART STRUCTURE AND SOME USE OF TRANSITIONAL ELEMENTS. MAINTAINS CONTACT WITH THE AUDIENCE. LEVEL IS APPROPRIATE, BUT THE LISTENER IS NOT TOTALLY CONVINCED THAT THE PRESENTER KNOWS HIS/HER TOPIC WELL.	IS THOROUGHLY FAMILIAR WITH THE TOPIC AND CAN RESPOND CONFIDENTLY AND SPONTANEOUSLY TO COMPLEX QUESTIONS. PRESENTATION IS WELL STRUCTURED, USES TRANSITIONAL ELEMENTS, AND FOLLOWS THE CONVENTIONS OF THE FIELD. GOOD EYE CONTACT, NO READING FROM HIS/HER PAPER. LEVEL APPROPRIATE FOR INTENDED AUDIENCE.
	NEGOTIATION AND PERSUASION	UTILISES FACTS TO SUPPORT CLAIMS. HELPS TO FIND SOLUTIONS THAT CONTRIBUTE TO POSITIVE OUTCOMES. CONTRIBUTES TO RESOLVING DIFFERENCES WITH OTHER STAFF OR PARTIES. RESPONDS TO CONFLICT WITHOUT WORSENING THE SITUATION AND REFERS TO A SUPERVISOR WHERE APPROPRIATE. KNOWS WHEN TO WITHDRAW FROM A CONFLICT SITUATION.	NEGOTIATES FROM AN INFORMED AND CREDIBLE POSITION. LEADS AND FACILITATES PRODUCTIVE DISCUSSIONS WITH STAFF AND STAKEHOLDERS. ENCOURAGES OTHERS TO TALK, SHARES AND DEBATES IDEAS TO ACHIEVE A CONSENSUS. RECOGNISES AND EXPLAINS THE NEED FOR COMPROMISE. INFLUENCES OTHERS WITH A FAIR AND CONSIDERED APPROACH AND SOUND ARGUMENTS. SHOWS SENSITIVITY AND UNDERSTANDING IN RESOLVING CONFLICTS AND DIFFERENCES. MANAGES CHALLENGING RELATIONS WITH INTERNAL AND EXTERNAL STAKEHOLDERS. PRE-EMPTS AND MINIMISES CONFLICT	ENGAGES IN A RANGE OF APPROACHES TO GENERATE SOLUTIONS, SEEKING EXPERT INPUTS AND ADVICE TO INFORM NEGOTIATING STRATEGY. USES SOUND ARGUMENTS, STRONG EVIDENCE, AND EXPERT OPINION TO INFLUENCE OUTCOMES. DETERMINES AND COMMUNICATES THE ORGANISATION'S POSITION AND BARGAINING STRATEGY. REPRESENTS THE ORGANISATION IN CRITICAL NEGOTIATIONS, INCLUDING THOSE THAT ARE CROSS JURISDICTIONAL, ACHIEVING EFFECTIVE SOLUTIONS IN CHALLENGING RELATIONSHIPS, AMBIGUOUS AND CONFLICTING POSITIONS. PRE-EMPTS AND AVOIDS CONFLICT ACROSS ORGANISATIONS AND WITH SENIOR INTERNAL AND EXTERNAL STAKEHOLDERS. IDENTIFIES CONTENTIOUS ISSUES, DIRECTS DISCUSSION AND DEBATE, AND STEERS PARTIES TOWARDS AN EFFECTIVE RESOLUTION.

AREA OF COMPETENCE	SPECIFIC COMPETENCE	LOW LEVEL	MEDIUM LEVEL	HIGH LEVEL
TEAM WORK AND COLLABORATION	GROUP WORK AND TEAM MANAGEMENT	WORKS UNIQUELY ALONE, DOES NOT COOPERATE, AVOID WORKING WITH PERSONS DIFFERENT EACH OTHER'S, DOES NOT TAKE INTO ACCOUNT OTHER PEOPLE'S IDEAS AND CONTRIBUTIONS, AVOID SHARING INFORMATION.	IS ABLE TO WORK IN GROUPS WITH A LOW LEVEL OF COMPLEXITY, COOPERATE ONLY UNDER CERTAIN CONDITIONS, CAN MANAGE MODERATE DIVERSITY IN A GROUP, PARTIALLY LISTEN OTHER PEOPLE'S IDEAS AND CONTRIBUTIONS, AND SHARE A FEW INFORMATION.	IS ABLE TO WORK INTERDEPENDENTLY AND TO CONTRIBUTE IN A VARIETY OF WORK TEAMS, PROMOTE COOPERATION, GIVE VALUE TO DIVERSITY IN A GROUP, RESPECTS IDEAS AND CONTRIBUTIONS OF OTHERS, SHARES INFORMATION ASSISTS IN MENTORING OTHERS.
	CONFLICT RESOLUTION	AVOIDS DIFFICULT CONVERSATIONS; DOES NOT LISTEN NOR EMPATHISE WITH OTHERS; TRIES TO FIND GUILTINESS; IS NOT FOCUSED ON THE OUTCOME; TAKES COMMENTS AS PERSONAL ATTACKS; IS NOT ABLE TO NEGOTIATE; PRIVILEGES COMPETITION AND WIN-LOSE OUTCOMES.	STANDS BUT CANNOT COMPLETELY MANAGE DIFFICULT CONVERSATIONS; LISTENS OTHERS BUT DOES NOT ALWAYS EMPATHISE; IS PARTIALLY FOCUSED ON THE OUTCOME; RARELY TAKES COMMENTS AS PERSONAL ATTACKS; TRIES TO NEGOTIATE; PROMOTES WIN-WIN OUTCOMES WHEN PARTICIPANTS ADHERE.	USES ASSERTIVENESS IN INITIATING DIFFICULT CONVERSATIONS; LISTENS IN AN OBJECTIVE, EMPATHIC WAY; AVOIDS THE BLAME GAME; IS FOCUSED ON THE OUTCOME; DOES NOT TAKE COMMENTS AS PERSONAL ATTACKS; IS ABLE TO NEGOTIATE; PROMOTES WIN-WIN OUTCOMES.
CRITICAL AND ANALYTICAL THINKING OR PROBLEM SOLVING, INCLUDING RISK ASSESSMENT	PROBLEM SOLVING ATTITUDE	DOES NOT RECOGNISE AND IS NOT ABLE TO ANALYSE PROBLEMS; IS NOT ORIENTED TO QUICKLY FIND SOLUTIONS; DOES NOT INVOLVE OTHERS; TENDS TO AVOID DECISION-MAKING OR TAKES UNCLEAR DECISIONS.	IDENTIFIES AND TRIES TO ANALYSE PROBLEMS; CAN DISTINGUISH RELEVANT FROM IRRELEVANT INFORMATION IN LOW COMPLEXITY SITUATION; TRY TO SEEK FOR BEST SOLUTIONS NOT NECESSARILY QUICKLY AND/OR INVOLVING OTHERS; MAKES DECISIONS; ACTS WITH INTEGRITY.	IDENTIFIES AND APPROPRIATELY ANALYSE PROBLEMS; DISTINGUISHES RELEVANT FROM IRRELEVANT INFORMATION; QUICKLY SEARCHES FOR BEST SOLUTIONS INVOLVING OTHERS; MAKES CLEAR, CONSISTENT, TRANSPARENT DECISIONS; ACTS WITH INTEGRITY IN ALL DECISION MAKING.
	RECOGNIZING OPPORTUNITIES	IS POORLY AWARE OF DATA/ INFORMATION/RESEARCH AVAILABLE TO INFORM AND DEVELOP AREAS OF WORK; SELDOMLY KEEPS UP TO DATE WITH INFORMATION AND ITS QUALITY IN ORDER TO MAKE JUDGEMENTS; TENDS TO TREAT INFORMATION FROM DIFFERENT PIECES OF INFORMATION AS SEPARATE.	IS AWARE OF DATA/ INFORMATION/RESEARCH AVAILABLE TO INFORM AND DEVELOP AREAS OF WORK; MODERATELY KEEPS UP TO DATE WITH INFORMATION AND ITS QUALITY IN ORDER TO MAKE JUDGEMENTS; IS ABLE TO SEE SOME NEW CONNECTIONS AND PATTERNS FROM AVAILABLE DATA.	IS AN AVID INFORMATION SEEKER, ALWAYS CARRYING OUT ACTIVITIES OF SEARCH FOR NEW INFORMATION/ DATA/RESEARCH; IS GOOD AT "CONNECTING THE DOTS", SEEING LINKS BETWEEN SEEMINGLY UNRELATED PIECES OF INFORMATION; HAS IDEAS ABOUT DEVELOPING NOVEL PRODUCTS, POLICIES, AND STRATEGIES FOR THE FUTURE.
	RISK MANAGEMENT	IS SCARCELY ABLE TO RECOGNIZE AND ASSESS RISK; IS NOT ABLE TO ACCEPT RISK; FEELS THAT BEING ABLE TO DEAL WITH RISK IS NOT IMPORTANT AND CANNOT BE LEARNED.	HAS A MODERATE ABILITY TO RECOGNIZE AND ASSESS RISK; IS ABLE TO ACCEPT RISK UNDER CERTAIN CONDITIONS; FEELS THAT BEING ABLE TO DEAL WITH RISK IS SOMEWHAT IMPORTANT AND BE LEARNED.	HAS A HIGH ABILITY TO RECOGNIZE AND ASSESS RISK; IS ABLE TO ACCEPT RISK; FEELS THAT BEING ABLE TO DEAL WITH RISK IS IMPORTANT AND CAN BE LEARNED.

AREA OF COMPETENCE	SPECIFIC COMPETENCE	LOW LEVEL	MEDIUM LEVEL	HIGH LEVEL
CREATIVITY AND INNOVATION	CREATIVITY AND LATERAL THINKING	CAN ONLY SEE THE IMMEDIATE PROBLEM AND EASY CONNECTIONS BETWEEN TOPIC OR IDEAS, PREFERS TRADITIONAL MODELS, EVEN IF OUTDATED, DOES NOT CHALLENGE THE STATUS QUO, GETS LOST IN THE DETAIL AND CANNOT SEE THE BIGGER PICTURE.	CAN SEE ALTERNATIVE AND INNOVATIVE SOLUTIONS TO PROBLEMS BUT CANNOT ALWAYS APPLY IT, CAN IMAGINE GOOD BUT NOT NECESSARILY INNOVATIVE WAYS TO TACKLE PROBLEMS, ADOPT LATERAL THINKING IF ACCOMPANIED.	CONSIDERS DIFFERENT APPROACHES, DISCIPLINES AND POINTS OF VIEW WHEN GENERATING SOLUTIONS, USES RESOURCES CREATIVELY, ORIGINATES ALTERNATIVES TO CONVENTIONAL THINKING, PRODUCES IMAGINATIVE OR UNIQUE RESPONSES TO A PROBLEM
	ADAPTABILITY	WILLINGLY TAKES ON NEW TASKS/ADOPTS NEW APPROACHES AS REQUIRED AS APPROPRIATE TO JOB ROLE. TAKES RESPONSIBILITY FOR KEEPING PROFESSIONAL SKILLS AND KNOWLEDGE UP TO DATE.	EMBRACES AND MANAGES CHANGE. SEEKS OPPORTUNITIES FOR CHANGE, SUPPORTING COLLEAGUES IN IMPLEMENTING NEW WAYS OF WORKING, EFFECTIVELY AND SUPPORTIVELY COMMUNICATING THE RATIONALE FOR CHANGE.	INSTIGATES AND LEADS PROGRAMMES OF CHANGE, WORKING IN CLOSE COLLABORATION WITH TEAM MATES/ COLLEAGUES. IDENTIFIES RESOURCE IMPLICATIONS OF STRATEGIC DEVELOPMENTS AND MANAGES THEM ACCORDINGLY.
	INNOVATION	SEEKS OUT, REVIEWS AND INTEGRATES NEW WAYS OF WORKING INTO ROLE.	REVIEWS, TESTS AND IMPLEMENTS NEW CONCEPTS, MODELS AND APPROACHES TO PRACTICE IN SUPPORT OF SERVICE DEVELOPMENT AND DELIVERY.	DEVELOPS AND IMPLEMENTS NEW CONCEPTS, MODELS, APPROACHES TO PRACTICE AND PRODUCTS THAT HAVE A SIGNIFICANT IMPACT ON THE LONGER TERM SUCCESS OF THE TEAM/ ORGANIZATION/COMPANY. DRIVES STRATEGIC THINKING.

APPENDIX 1: SOCCES ASSESSMENT FRAMEWORK FOR ENTREPRENERIAL TRANSVERSAL COMPETENCES: ASSESSMENT METHOD

AREA OF COMPETENCE	SPECIFIC COMPETENCE	ASSESSMENT TOOL	
		EXTENDED VERSION	SHORT VERSION
POSITIVE ATTITUDE AND INITIATIVE	SELF ASSESSMENT	EMPOWERMENT SCALE (ROGERS, CHAMBERLIN, ELLISON, & CREAM, 1997) (SELF-ASSESSED)	EMPOWERMENT SCALE (ROGERS ET AL., 1997) (SELF-ASSESSED)
	GROWTH MINDSET	MINDSET SCALE (DWECK, 1999) (SELF-ASSESSED)	SHORT MINDSET SCALE (DWECK, 2006) (SELF-ASSESSED AND ETERO-ASSESSED)
	EMOTIONAL INTELLIGENCE	BRIEF EMOTIONAL INTELLIGENCE SCALE (DAVIES ET AL., 1998) (SELF-ASSESSED AND ETERO-ASSESSED)	-
	PERSEVERANCE	PERSEVERANCE SCALE (KYNDT & BAERT, 2015) AND NARRATIVE FORM (SELF-ASSESSED AND ETERO-ASSESSED)	PERSEVERANCE SCALE (KYNDT & BAERT, 2015) (SELF-ASSESSED AND ETERO-ASSESSED)
	COPING STRATEGY	SELF-KNOWLEDGE, ORIENTATION TOWARDS LEARNING, AND PLANNING FOR FUTURE SCALE (KYNDT & BAERT, 2015) (SELF-ASSESSED AND ETERO-ASSESSED)	PLANNING FOR FUTURE SCALE (KYNDT & BAERT, 2015) (SELF-ASSESSED AND ETERO-ASSESSED)

AREA OF COMPETENCE	SPECIFIC COMPETENCE	ASSESSMENT TOOL	
		EXTENDED VERSION	SHORT VERSION
COMMUNICATION AND INTERACTION	GENERAL COMMUNICATION	INTERPERSONAL COMMUNICATION COMPETENCE SCALE (RUBIN & MARTIN, 1994) AND NARRATIVE FORM (SELF-ASSESSED AND ETERO-ASSESSED)	INTERPERSONAL COMMUNICATION COMPETENCE SCALE (RUBIN & MARTIN, 1994) (SELF-ASSESSED AND ETERO-ASSESSED)
	INTERACTION	INTERPERSONAL COMMUNICATION COMPETENCE SCALE (RUBIN & MARTIN, 1994) AND NARRATIVE FORM (SELF-ASSESSED AND ETERO-ASSESSED)	INTERPERSONAL COMMUNICATION COMPETENCE SCALE (RUBIN & MARTIN, 1994) (SELF-ASSESSED AND ETERO-ASSESSED)
	PRESENTATION	PRESENTATION EXERCISE AND INTERPERSONAL COMMUNICATION COMPETENCE SCALE (RUBIN & MARTIN, 1994) AND NARRATIVE FORM (SELF-ASSESSED AND ETERO-ASSESSED)	-
	NEGOTIATION AND PERSUASION	ENTREPRENEURIAL COMPETENCES SCALE (ABILITY TO PERSUADE SCALE (KYNDT AND BAERT, 2015) AND NARRATIVE FORM (SELF-ASSESSED AND ETERO-ASSESSED)	ENTREPRENEURIAL COMPETENCES SCALE (ABILITY TO PERSUADE SCALE (KYNDT AND BAERT, 2015) (SELF-ASSESSED AND ETERO-ASSESSED)

AREA OF COMPETENCE	SPECIFIC COMPETENCE	ASSESSMENT TOOL	
		EXTENDED VERSION	SHORT VERSION
TEAM WORK AND COLLABORATION	GROUP WORK AND TEAM MANAGEMENT	BELBIN ROLE SELF-ASSESSMENT TOOL (SELF-ASSESSED)	-
	CONFLICT RESOLUTION	INTERPERSONAL COMMUNICATION COMPETENCE SCALE (RUBIN & MARTIN, 1994) (SELF-ASSESSED)	-
CRITICAL AND ANALYTICAL THINKING OR PROBLEM SOLVING, INCLUDING RISK ASSESSMENT	PROBLEM SOLVING ATTITUDE	CREATIVE PROBLEM SOLVING SCALE (MORRIS ET AL., 2013) (SELF-ASSESSED)	CREATIVE PROBLEM SOLVING SCALE (MORRIS ET AL., 2013) (SELF-ASSESSED)
	RECOGNIZING OPPORTUNITIES	OPPORTUNITY RECOGNITION SCALE + CONVEYING A VISION/ SEEING THE FUTURE SCALE) (MORRIS ET AL, 2013) (SELF-ASSESSED)	OPPORTUNITY RECOGNITION SCALE (MORRIS ET AL, 2013) (SELF-ASSESSED)
	RISK MANAGEMENT	RISK MANAGEMENT SCALE (MORRIS ET AL., 2013) (SELF-ASSESSED)	-
CREATIVITY AND INNOVATION	CREATIVITY AND LATERAL THINKING	CREATIVE PROBLEM SOLVING SCALE (MORRIS ET AL., 2013) (SELF-ASSESSED)	-
	ADAPTABILITY	MAKING DECISIONS SCALE (ROGERS ET AL., 1997) (SELF-ASSESSED)	-
	INNOVATION	INNOVATIVENESS SCALE (MUELLER & THOMAS, 2001) (SELF-ASSESSED)	-

## APPENDIX 2: BUSINESS CHALLENGE DESCRIPTION: HELSINKI CENTRAL LIBRARY PROJECT

The aim of this document is to briefly describe the business case offered by Helsinki Central Library Project. The main challenge and an idea how it could be developed into a student project is described briefly.

### Case organization and background

The city of Helsinki is building a new Central Library at Töölönlahti Bay in the heart of Helsinki culture cluster. The new building is under construction and the doors will be opened to the public on 6th December 2018 on the Finnish Independence Day. A place of civic participation will rise opposite the Parliament House that will bring together those interested in city culture and civic participation.

When completed, the Central Library will reach some 10,000 visitors per day and some 2.5 million visitors annually. The Central Library offers a public space open to all in the heart of the city. It will raise the profile of Helsinki and form the display window of this creative city. It will be made into the city residents' own house where culture can be created individually or with others. This digitally intelligent library will provide the city residents with information to support their decision-making in everyday life. Learning, competence sharing and opening of contents are supported by means of different technologies.

More information about the new library and the project can be found here:  
<http://keskustakirjasto.fi/en/>

### The challenge

The role of a library is changing. It is no longer just a stock of books – all kind of digital content is already available in modern libraries and the selection of services ranges from lending things to supporting active citizenship. Helsinki wants to find its own model for the libraries of the future. However, the main focus is on the library's

## APPENDIX 3: SOCCES PILOT - WEEKLY ASSIGNMENTS

### WEEK 1: TEAM BUILDING

<b>GOAL</b>	<b>BUILD A TEAM, DEFINE THE ROLES AND RULES NECESSARY FOR TEAMWORK. PRESENT THE TEAM TO THE OTHER PILOT TEAMS.</b>
<b>TASK</b>	<ul style="list-style-type: none"> <li>• ANSWER TO THE PRE-EVALUATION.</li> <li>• PARTICIPATE IN THE FACE-TO-FACE INTRODUCTION SESSION.</li> <li>• REALIZE THE MARSHMALLOW CHALLENGE, MEASURE THE OUTCOME AND CAPTURE THE WORK ON PHOTO/VIDEO.</li> <li>• REALIZE THE BELBIN TEAM ROLE TASK TO DEFINE ONE'S OWN TYPICAL ROLE IN A TEAM AND DECIDE THE ROLE EACH ONE TAKES IN THIS TEAM. DECIDE THE TEAM RULES.</li> <li>• PREPARE A PRESENTATION ON THE TEAM IN ENGLISH AND DOWNLOAD IT ON THE VIRTUAL PLATFORM.</li> <li>• YOU WILL FIND SUPPORT FOR YOUR TASK ON THE VIRTUAL PLATFORM IN THE FOLDER MATERIAL FOR THE PILOTING STUDENTS</li> </ul>
<b>TIMING</b>	<b>WEEK 7: FEBRUARY 15-21, 2016</b>
<b>OUTCOME</b>	MARSHMALLOW CHALLENGE OUTCOME DOCUMENTED TEAM ROLES AND RULES DOCUMENTED TEAM PRESENTATION DOCUMENTED AND DELIVERED ON VIRTUAL PLATFORM
<b>SUCCESS CRITERIA</b>	<b>THE COMPETENCES ADDRESSED DURING THE TASK ARE TEAMWORK, COMMUNICATION, CREATIVITY AND INNOVATION</b>

### WEEK 2: PLAN / DEFINE

<b>GOAL</b>	<b>LEARN TO PLAN A DEVELOPMENT WORK. PLAN THE DEVELOPMENT WORK FOR THE PILOT.</b>
<b>TASK</b>	<p>LEARN TO KNOW THE OTHER TEAMS THROUGH THEIR PRESENTATIONS</p> <ul style="list-style-type: none"> <li>• COMMENT/DISCUSS THE OTHER TEAMS' PRESENTATIONS ON THE VIRTUAL PLATFORM DISCUSSION FORUM.</li> <li>• UNDERSTAND THE HELSINKI CENTRAL LIBRARY'S CHALLENGE.</li> <li>• DEFINE A CHALLENGE FOR YOUR TEAM'.</li> <li>• PLAN THE DEVELOPMENT WORK: CHOOSE AN APPROACH AND METHODS FOR TACKLING THE CHALLENGE.</li> <li>• ENSURE THE PREREQUISITES FOR THE COMPLETION OF THE PROJECT.</li> <li>• MAKE A PROJECT PLAN.</li> <li>• PREPARE A PRESENTATION FOR THE NEXT WEEK'S WEBINAR. BRAINSTORMING SESSION DESCRIBING YOUR CHALLENGE AND APPROACH.</li> </ul> <p>YOU WILL FIND SUPPORT FOR YOUR TASK ON THE VIRTUAL PLATFORM IN THE FOLDER MATERIAL FOR THE PILOTING STUDENTS</p>

core competence. Versatile reading skills and the ability to evaluate media critically are the foundations of active citizenship, and the Central Library will do its part to support them. In addition, the Central Library wants to become an active enabler and enricher of modern city life. Moreover, it is to be a public space where people work, meet and interact.

How is all this put into action? Helsinki Central Library 2018 is a new kind of project, whose contents and operation models are being sought in co-operation with the library, city residents, and partners. The Central Library project is based on the idea that more than architects are needed to create a new, functional library at the Helsinki City center: the needs and wishes of city residents are incorporated into the design process.

In this case, the Library invites the student groups to participate in finding solutions to the question

- What new services and opportunities of active participation could be incorporated into the Central Library in order to best support the creation of an open, active, and equal society?

### Alternative tasks for student groups

The student groups will find out and suggest concrete solutions to the question by choosing one of the following approaches:

1. Benchmarking what libraries in their own city or country have done
2. Brainstorming ideas in a group (student team and/or invited participants)
3. Collecting ideas by interviewing relevant people

## APPENDIX 4: TEAMBUILDING - THE MARSHMALLOW CHALLENGE

### WEEK 3: EXECUTION / DEVELOPMENT

<b>GOAL</b>	<b>LEARN AND EXPRESS COMPETENCES REQUIRED IN SOLVING REAL WORKING LIFE CHALLENGES.</b>
<b>TASK</b>	<ul style="list-style-type: none"> <li>PARTICIPATE IN BRAINSTORMING WEBINAR SESSION ON MONDAY FEBRUARY 29<sup>TH</sup> AT 2PM CET</li> <li>ORGANISE AND PARTICIPATE IN THE DEVELOPMENT WORKSHOPS ACCORDING TO THE PLANS.</li> <li>FINALISE THE SOLUTION.</li> </ul> <p>YOU WILL FIND SUPPORT FOR YOUR TASK ON THE VIRTUAL PLATFORM IN THE FOLDER MATERIAL FOR THE PILOTING STUDENTS</p>
<b>TIMING</b>	<b>WEEK 9: FEBRUARY 29 - MARCH 4, 2016</b>
<b>OUTCOME</b>	<b>WORKSHOPS (INCL. WEBINAR) LEADING TO DEVELOPMENT PROPOSALS.</b>
<b>SUCCESS CRITERIA</b>	<b>THE COMPETENCES ADDRESSED DURING THE TASK ARE : PROBLEM SOLVING, TEAMWORK</b>

### WEEK 4: DELIVERY

<b>GOAL</b>	<b>FINALISATION, EVALUATION AND DELIVERY OF THE WORK.</b>
<b>TASK</b>	<ul style="list-style-type: none"> <li>PREPARE AN INSPIRING DELIVERY TO SUMMARIZE THE TEAMWORK.</li> <li>PARTICIPATE TO THE WEBINAR SESSION AND PRESENT THE OUTCOME OF THE TEAMWORK ON MONDAY MARCH 7<sup>TH</sup> AT 2PM CET</li> <li>DELIVER THE FINAL SOLUTION (DEADLINE 14.3.2016)</li> <li>ANSWER TO THE POST-EVALUATION.</li> </ul> <p>YOU WILL FIND SUPPORT FOR YOUR TASK ON THE VIRTUAL PLATFORM IN THE FOLDER MATERIAL FOR THE PILOTING STUDENTS</p>
<b>TIMING</b>	<b>WEEK 9: FEBRUARY 29 - MARCH 4, 2016</b>
<b>OUTCOME</b>	<b>WEBINAR PRESENTATION, DOCUMENTED FINAL SOLUTION</b>
<b>SUCCESS CRITERIA</b>	<b>THE COMPETENCES ADDRESSED DURING THE TASK ARE : TEAMWORK, COMMUNICATION, CREATIVITY AND INNOVATION, CRITICAL THINKING, POSITIVE ATTITUDE</b>

Teambuilding is an essential part of the preparation work required for successful team work especially when the team members are not used to working together. Several teambuilding activities can be found in literature and online. A relatively easy choice is the Marshmallow challenge which can be run in various environments and people of different age, educational or social background. Actually small children seem to best succeed in this task.

Teambuilding with the help of Marshmallow challenge takes less than half an hour to run (18 min's test period). Therefore it is possible to videorecord the work of the various teams and after the test period go through the video with the participants to discuss and reflect the role each person took while completing the task. This can be a revelator and help people identify their strenghts and weaknesses and develop themselves as team players.

The following practical instructions guide in running the Marshmallow challenge. More information can be found online :

- Peter Skillman Marshmallow Design Challenge - <https://www.youtube.com/watch?v=1p5sBzMtB3Q>
- Build a tower, build a team | Tom Wujec - [https://www.youtube.com/watch?v=Ho\\_yKBitO8M](https://www.youtube.com/watch?v=Ho_yKBitO8M)

### Preparation:

**Timing:** Requires 45-60 minutes when the team can fully concentrate on the task.

**Premises:** A peaceful room with a table and chairs for each team.

#### Supplies for the teams:

- A marshmallow challenge kit for each team containing: 20 sticks of uncooked spaghetti (not spaghettini nor fettucini), one metre of masking tape, one metre of string that can be easily broken by hand, one marshmallow and a paper bag for each challenge kit.
- A copy of the instructions for each team: [http://marshmallowchallenge.com/Instructions\\_files/TED2010\\_Tom\\_Wujec\\_Marshmallow\\_Challenge\\_Web\\_Version.pdf](http://marshmallowchallenge.com/Instructions_files/TED2010_Tom_Wujec_Marshmallow_Challenge_Web_Version.pdf)

#### Supplies for the organisers:

- Self-retracting tape measure
- Stopwatch (or countdown application)
- Video recorder

## Instructions on running the task:

### A: Deliver Clear Instructions :

Describe clearly the goals of the Marshmallow Challenge.

- The goal is to build the Tallest Freestanding Structure in 18 minutes.
- The winning team is the one that has the tallest structure measured from the table top surface to the top of the marshmallow. That means the structure cannot be suspended from a higher structure, like a chair, ceiling or chandelier
- The entire Marshmallow MUST be on Top on the top of the structure. Cutting or eating part of the marshmallow disqualifies the team.

Assure that everyone knows the rules:

- Teams can use as much or as little of the kit but the paper bag is not allowed to be used for the structure.
- The spaghetti, string and tape can be used as wanted (cut, broken down, put together) for creating the new structure.
- The Challenge Lasts 18 minutes: Teams cannot hold on to the structure when the time runs out. Those touching or supporting the structure at the end of the exercise will be disqualified.
- Ensure Everyone Understands the Rules: Don't worry about repeating the rules too many times. Repeat them at least three times. Ask if anyone has any questions before starting.

### B. Start the Challenge

- Start the countdown clock.
- Walk around the Room: It's amazing to see the development of the structures as well as notice the patterns of innovation most teams follow.
- Remind the Teams of the Time: Countdown the time. Usually, I call 12 minutes, 9 minutes (half-way through), 7 minutes, 5 minutes, 3 minutes, 2 minutes, 1 minute, 30 seconds and a ten-second count down.
- Call Out How the Teams are Doing: Let the entire group know how teams are progressing. Call out each time a team builds a standing structure. Build a friendly rivalry. Encourage people to look around. Don't be afraid to raise the energy and the stakes.
- Remind the Teams that Holders will be Disqualified: Several teams will have the powerful desire to hold on to their structure at the end. Usually because the marshmallow, which they just placed onto their structure moments before, causing the structure to buckle. The winning structure needs to be stable.

### C: Finish the Challenge

After the clock runs out, ask everyone in the room to sit down so everyone can see the structures. Likely, just over half the teams will have standing structures.

- Measure the Structures: From the shortest standing structure to the tallest, measure and call out the heights. If you're documenting the challenge, have someone record the heights.
- Identify the Winning Team: Ensure they get a standing ovation and a prize.
- Wrap up with the lessons learnt.

## APPENDIX 5: TEAM ROLES – TASK ROLES – BELBIN ROLES

Introduction: The role we take in a team is according to Dr. Meredith Belbin as "our tendency to behave, contribute and interrelate with others in a particular way". We all have natural tendencies in workplace activities. Understanding your personal team role preferences can help to develop yourself as a team member further in with your career. In this respect it is important to consider that your behavior on a team is not determined solely by your preferences. There are other factors that should be taken into account when taking a task role in a team. These include

1. the role you are expected to play
2. the demands of the work
3. the roles other team members play
4. the need to compensate for what the team lacks
5. your training or education
6. the work environment.

Several studies as well as practice has proved that teams need a sound mix of different people to be effective and therefore team members' task roles need to be defined in the beginning to assure the best outcome (Fisher, Hunter & MacRosson, 1998). Often this means choosing a task role that is suitable for the person in question and necessary for assuring good outcome of team work.

The Belbin Roles (Belbin Team Inventory, Belbin Self-Perception Inventory, Belbin Team Role Inventory) is a behavioral test developed by Dr. M. Belbin, a U.K. researcher. It concentrates on identifying indentifying the personal caractersitics or typical role that each one takes in a team. Moreover, Belbin has identified nine identified types of team roles (Belbin, 1993; <http://www.belbin.com/media/1206/jo-pink-self-perception-plus-observers-report.pdf>). Later on it has been revealed that the Belbin team roles fit easily into a "Big Five" five-factor personality framework (openness, conscientiousness, extraversion, agreeableness and neuroticism) (Fisher, Hunter & MacRosson, 2001).

General Role Type	Belbin Team Role Type	Strengths	Allowable Weaknesses
Cerebral	Plant	Creative, imaginative, unorthodox. Solves difficult problems.	Ignores incidentals. Too preoccupied to communicate effectively.
	Specialist	Single-minded, self-starting, dedicated. Provides knowledge and skills in rare supply.	Contributes only on a narrow front. Dwells on technicalities.
	Monitor Evaluator	Sober, strategic and discerning. Sees all options. Judges accurately.	Lacks drive and ability to inspire others.
Action Oriented	Implementer	Disciplined, reliable, conservative and efficient. Turns ideas into practical actions.	Somewhat inflexible. Slow to respond to new possibilities.
	Shaper	Challenging, dynamic, thrives on pressure. The drive and courage to overcome obstacles.	Prone to provocation. Offends people's feelings.
	Completer Finisher	Painstaking, conscientious, anxious. Searches out errors and omissions. Delivers on time.	Inclined to worry unduly. Reluctant to delegate.
People Oriented	Teamworker	Co-operative, mild, perceptive and diplomatic. Listens, builds, averts friction.	Indecisive in crunch situations.
	Coordinator	Mature, confident, a good chairperson. Clarifies goals, promotes decision-making, delegates well.	Can often be seen as manipulative. Off loads personal work.
	Resource Investigator	Extrovert, enthusiastic, communicative. Explores opportunities. Develops contacts.	Over-optimistic. Loses interest once initial enthusiasm has passed.

Belbin Type	Favorite Phrases and Slogans
Plant	<p>When a problem is baffling, think laterally.            Where there's a problem, there's a solution.            The greater the problem, the greater the challenge.            Do not disturb, genius at work.            Good ideas always seem strange at first.            Ideas start with dreaming.            Without continuous innovation, there is no survival.</p>
Specialist	<p>In this job you never stop learning.            Choose a job you love, and you'll never have to work a day of your life.            True professionalism is its own reward.            My subject is fascinating to me.            The more you know, the more you find to discover.            It is better to know a lot about something, than a little about everything.            A committee is 12 people doing the work of one.</p>
Monitor Evaluator	<p>I'll think it over and give you a firm decision tomorrow.            Have we exhausted all the options?            If it does not stand up to logic, it's not worth doing!            Better to make the right decision slowly than the wrong one quickly.            This looks like the best option on balance.            Let's weigh up the alternatives.            Decisions should not be based purely on enthusiasm.</p>
Implementer	<p>If it can be done, we will do it.            An ounce of action is worth a pound of theory.            Hard work never killed anybody.            The difficult we do it immediately. The impossible takes a little longer.            To err is human, to forgive is not company policy.            Let's get down to the task in hand.            The company has my full support.</p>
Shaper	<p>Just do it!            Say "no", then negotiate.            If you say "yes I will do it", I expect it to be done.            I'm satisfied we are achieving all we can.            I may be blunt, but at least I am to the point.            I'll get things moving.            When the going gets tough, the tough get going.</p>

Belbin Type	Favorite Phrases and Slogans
Completer Finisher	<p>This is something that demands our undivided attention.            The small print is always worth reading.            Murphy's Law: "If it can go wrong, it will go wrong" ...            O'Toole's Law: "Murphy was an optimist".            There is no excuse for not being perfect.            Perfection is only just good enough.            A stitch in time saves nine.            Has it been checked?</p>
Teamworker	<p>Courtesy costs nothing.            I was very interested in your point of view.            If it's all right with you, it's all right with me.            Everybody has a good side worth appealing to.            If people listened to themselves more, they would talk less.            You can always sense a good atmosphere at work.            I try to be versatile.</p>
Coordinator	<p>Let's keep the main objective in sight.            Has anyone else got anything to add to this?            We like to reach a consensus before we move forward.            Never assume that silence means approval.            I think that we should give someone else a chance.            Good delegation is an art.            Management is the art of getting other people to do all the work.</p>
Resource Investigator	<p>We could make a fortune out of that.            Ideas should be stolen with pride.            Never reinvent the wheel.            Opportunities arise from other people's mistakes.            Surely we can exploit that?            You can always telephone to find out.            Let me google that for you.            Time spent in reconnaissance is seldom wasted.</p>

### Activity 1: Identify individual roles

Decide for yourself based on the above tables what your team role could be. Keep in mind that you might be more than just one role type.

### Activity 2: Work out team roles

Fill in the following team role grid for the members in your team.

\*\* Mark two stars in the appropriate box if the group member shows strong characteristics of a Belbin type.

\*\* Mark one star if the group member shows the characteristics to some extent.

Name of Group Member	1.	2.	3.	4.	5.
Plant					
Specialist					
Monitor Evaluator					
Implementer					
Shaper					
Completer Finisher					
Teamworker					
Coordinator					
Resource Investigator					

### Activity 3: What's missing?

What roles are not filled in by members in this group?  
How might you overcome this potential problem?

## APPENDIX 6: EXAMPLES OF SIMPLE DATA COLLECTION METHODS

**Man in the street interviews** are sometimes also called Gorilla interviews. These are impromptu interviews which are mostly recorded through video. They are usually conducted by two people, a researcher and a cameraman. This method can uncover tacit knowledge and detailed information. Be prepared with around 10 questions on the topic. Conduct a preliminary interview to test the method and your questions. Select the location and consider that it should not be too noisy or have other distracting influences.

Approach people politely by asking "Excuse me, I work for this organization and I was wondering if you would like to share your opinion on this topic". Remember to limit your time! The interviews should not take more than 5-10 minutes. Conduct at least 6-10 interviews.

**One-on-One interviews** are interviews between the interviewer and participant in a face to face situation. This is the best method when personal information is being discussed.

When using this method information about the usage context, the user and is learned.

Think of making a preliminary interview to test the questions and to prepare yourself for the actual interview. Also asking for permission is important.

Go to the user's context. Take along a notebook, pens, the interview questions and the interview schedule. Recording the interview is very valuable because it allows you to concentrate on the interview situation instead of interrupting by taking notes. Talk, watch, listen and observe. Do your best to understand the likes and dislikes of interviewee. Collect stories and insights. See the world from the interviewee's point of view. A one-on-one interview can last up to two hours.

**Unstructured interviews** are interviews where the preliminary questions or research topics are planned in advance but the questions can be modified as needed by the researcher during the interview session. Unstructured interviews are used in ethnographies and case studies. This technique encourages respondents to discuss sensitive experiences or deeper thoughts.

**The Photo elicitation technique** uses photos as probes to encourage discussion on thoughts, experiences and feelings. Photos can make starting the interview easier. Therefore this method is sometimes also used to interview children. Moreover, photos can uncover hidden meanings which would not be revealed in a traditional face-to-face interview.

The photo can be taken by either the researcher or the participant. The researcher analyzes the photo and plans the interview process. Then the researcher shows the photos to the participant and discusses the thoughts, feeling and experiences related to the photo. After this, the interview is analyzed by the researcher who creates a list of insights gained.

**Shadowing** means staying in the shade and observing a person, group of people or a situation without interfering. “Shadowing provides a rich, comprehensive data set about the patterns of actions, interdependence and motivations of users. Observation is enhanced with information about mood, body language, pace and timing in order to give a full picture of the world from the user’s point of view.”

**Mystery shopping** is another observation method, somewhat similar to shadowing. The observer is the mystery shopper who pretends to be a customer and observes the other customers, the services or the service provider in complete anonymity. He behaves as a normal customer making his shopping although simultaneously observing the situation closely (IPSOS, 2012; Lang, 2014). Most of the time the goal is to measure the quality of the service delivery to the customer. Mystery shopping can also be used to benchmark by sending mystery guests to branch offices of competitors (Wiele, Hesselink & Iwaarden, 2005).

**Benchmarking** is a process of comparing services, processes and performance metrics to industry bests and best practices from other companies. It can also be seen as a method of collecting so called best practice information from other companies or organisations.

Benchmarking allows organizations to develop plans on how to make improvements or adapt specific best practices, usually with the aim of increasing some aspect of performance. Benchmarking may be a one-off event, but is often treated as a continuous process in which organizations continually seek to improve their practices.

Quality, time, cost, output are variables that are often measured. After having identified the element to be benchmarked and the indicators to be used, the benchmarking process continues by identifying the most interesting companies/industry to be chosen as the source of reference information. Collecting information continues by the comparison of the results. In this process various tools can be used, such for example those listed below or others.

- Comparison tables
- SWOT analysis
- Potential/resources-analysis
- Price/performance ratio
- Life cycle analysis
- Portfolio attractiveness customer/supplier position

## APPENDIX 7: COLLABORATIVE INNOVATION AND DEVELOPMENT METHODS

### General problem solving tools

- Constructive controversy:  
[https://www.mindtools.com/pages/article/newTMC\\_71.htm](https://www.mindtools.com/pages/article/newTMC_71.htm)

### Examples of ideation techniques

- Brainstorming:  
[https://www.mindtools.com/pages/main/newMN\\_CT.htm](https://www.mindtools.com/pages/main/newMN_CT.htm)  
<http://creatingminds.org/tools/brainstorming.htm>
- Brainwriting:  
[https://www.mindtools.com/pages/article/newCT\\_86.htm](https://www.mindtools.com/pages/article/newCT_86.htm)  
<http://creatingminds.org/tools/brainwriting.htm>
- Six Thinking Hats:  
[http://creatingminds.org/tools/six\\_hats.htm](http://creatingminds.org/tools/six_hats.htm)

APPENDIX 8: CO-CREATION TOOLS AND ASSESSMENT METHODS TO BE USED IN CLASSROOM

COMPETENCES, SKILLS	TASK OR LEARNING SITUATION FOR ASSESSMENT (CO-CREATION TOOLS)
<b>POSITIVE ATTITUDE AND INITIATIVE</b> 1. SELF-ASSESSMENT 2. GROWTH MINDSET 3. EMOTIONAL INTELLIGENCE 4. PERSEVERANCE 5. COPING STRATEGY	GROUP TASK (E.G. MARSHMALLOW CHALLENGE) WORLD CAFÉ FUTURE CREATING WORKSHOP OPEN SPACE FACILITATION CAMP
<b>COMMUNICATION AND INTERACTION</b> 1. GENERAL COMMUNICATION 2. INTERACTION 3. PRESENTATION 4. NEGOTIATION AND PERSUASION	PRESENTATION REPORT WEBINAR TEAM MEETING NEGOTIATION WITH BUSINESS PARTNER COLLABORATIVE WRITING READING CIRCLE WORLD CAFÉ FUTURE CREATING WORKSHOP OPEN SPACE FACILITATION CAMP
<b>TEAMWORK AND COLLABORATION</b> 1. GROUP WORK AND TEAM MANAGEMENT 2. CONFLICT RESOLUTION	MARSHMALLOW CHALLENGE ROLE PLAY COLLABORATIVE WRITING WORLD CAFÉ FUTURE CREATING WORKSHOP OPEN SPACE FACILITATION CAMP DESIGN BOOTCAMP
<b>CRITICAL AND ANALYTICAL THINKING</b> 1. PROBLEM SOLVING ATTITUDE 2. RECOGNIZING OPPORTUNITIES 3. RISK MANAGEMENT	SIX THINKING HATS MIND MAPPING READING CIRCLE WORLD CAFÉ FUTURE CREATING WORKSHOP DEBATES FOCUS GROUPS
<b>CREATIVITY AND INNOVATION</b> 1. CREATIVITY AND LATERAL THINKING 2. ADAPTABILITY 3. INNOVATION	MARSHMALLOW CHALLENGE IDEA GENERATION SESSION (METHODS: BRAINSTORMING, LEANING CAFÉ, 8X8, 6-3-5, SCAMPER) INNOVATION DESIGN BOOTCAMP

SELF AND PEER ASSESSMENT METHODS	TEACHER'S ASSESSMENT METHODS
<ul style="list-style-type: none"> <li>REFLECTION TOOLS (SEE MARSHMALLOW CHALLENGE)</li> <li>LEARNING DIARY EMPOWERMENT SCALE (ROGERS ET AL., 1997) (SELF-ASSESSED)</li> <li>MINDSET SCALE (DWECK, 1999) (SELF-ASSESSED)</li> </ul>	<ul style="list-style-type: none"> <li>BUSINESS CASE</li> <li>OBSERVATION AND FEEDBACK PROVISION – GROUP/TEAM WORK PERFORMANCE</li> <li>BRIEF EMOTIONAL INTELLIGENCE SCALE (DAVIES ET AL., 1998) (SELF-ASSESSED AND ETERO-ASSESSED)</li> <li>PERSEVERANCE SCALE (KYNDT &amp; BAERT, 2015) AND NARRATIVE FORM (SELF-ASSESSED AND ETERO-ASSESSED)</li> <li>SELF-KNOWLEDGE, ORIENTATION TOWARDS LEARNING, AND PLANNING FOR FUTURE SCALE (KYNDT &amp; BAERT, 2015) (SELF-ASSESSED AND ETERO-ASSESSED)</li> </ul>
<ul style="list-style-type: none"> <li>REFLECTION TOOLS</li> </ul>	<ul style="list-style-type: none"> <li>BUSINESS CASE</li> <li>DESIGN PROJECT/CHALLENGE</li> <li>INTERPERSONAL COMMUNICATION COMPETENCE SCALE (RUBIN &amp; MARTIN, 1994) AND NARRATIVE FORM (SELF-ASSESSED AND ETERO-ASSESSED)</li> <li>PRESENTATION EXERCISE</li> <li>ENTREPRENEURIAL COMPETENCES SCALE (ABILITY TO PERSUADE SCALE (KYNDT AND BAERT, 2015))</li> </ul>
<ul style="list-style-type: none"> <li>BELBIN TEAMROLE TEST</li> <li>REFLECTION TOOLS</li> <li>INTERPERSONAL COMMUNICATION COMPETENCE SCALE (RUBIN &amp; MARTIN, 1994) (SELF-ASSESSED)</li> </ul>	<ul style="list-style-type: none"> <li>BUSINESS CASE</li> <li>TEAM CONTRACTING</li> <li>TEAM WORK PERFORMANCE CRITERIA MEASUREMENT</li> <li>NARRATIVE EXERCISES</li> <li>OBSERVATION OF AND FEEDBACK PROVISION FOR COLLABORATIVE WORKING METHODS PERFORMANCE</li> </ul>
<ul style="list-style-type: none"> <li>CREATIVE PROBLEM SOLVING SCALE (MORRIS ET AL., 2013) (SELF-ASSESSED)</li> <li>OPPORTUNITY RECOGNITION SCALE + CONVEYING A VISION/SEEING THE FUTURE SCALE) (MORRIS ET AL, 2013) (SELF-ASSESSED)</li> <li>RISK MANAGEMENT SCALE (MORRIS ET AL., 2013) (SELF-ASSESSED)</li> </ul>	<ul style="list-style-type: none"> <li>INTERNATIONAL MINDEDNESS TEST</li> <li>OBSERVATION AND FEEDBACK PROVISION</li> <li>RISK MANAGEMENT SCALE ASSESSMENT – TQM; PDCA CYCLE</li> <li>BUSINESS CASE</li> </ul>
<ul style="list-style-type: none"> <li>CREATIVE PROBLEM SOLVING SCALE (MORRIS ET AL., 2013) (SELF-ASSESSED)</li> <li>MAKING DECISIONS SCALE (ROGERS ET AL., 1997) (SELF-ASSESSED)</li> <li>INNOVATIVENESS SCALE (MUELLER &amp; THOMAS, 2001) (SELF-ASSESSED)</li> </ul>	<ul style="list-style-type: none"> <li>BUSINESS CASE</li> <li>DESIGN PROJECTS WITH ASSESSMENT CRITERIA RUBRICS</li> </ul>



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*Together we are stronger*



Auli Guiland

## SOCCEs HANDBOOK - ASSESSMENT OF TRANSVERSAL COMPETENCES

This handbook was created as a part of the SOCCEs project. SOCCEs stands for **SO**cial Competences, **EN**trepreneurship and **SEN**se of Initiative – Development and Assessment Framework. SOCCEs was a two-year project running from 1/2/2015 to 31/1/2017 and funded by European Commission Erasmus+ Programme. It involved seven partners from six European countries. The aim was to develop an assessment framework for transversal competences. SOCCEs focused two competences, **Sense of Initiative and Entrepreneurship, and Social Competences**.

This handbook provides **teachers** with the means to:

- Define and describe these entrepreneurial and social competences for their students
- Support students with the development of these competences in an inclusive, virtually enabled setting
- Assess and provide feedback to their students on how they are progressing in the development of entrepreneurial and social competences

And it provides **learners** with:

- The means to describe, self-assess and benchmark their entrepreneurial and social competences
- The language to articulate these competences to others such as teachers and employers
- A means to develop with them in an accessible, virtually enabled environment

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