Learning strategies to promote transversal skills on health and social care studies

A methodological Guide

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(coordinators)

Integration of Transversal skills in Health and Social Care, Higher Education and curriculum
Coord.: Mar Carrió and Nathália Rosa

ITSHEC - Integration of Transversal skills in Health and Social Care, Higher Education and curriculum

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Presentation

This **Methodological Guide** has been prepared to offer different strategies for the development of transversal skills (TS) of students (including critical and creative thinking, interpersonal/socioemotional and citizen-oriented skills, and learning to learn). With this, we hope to provide a guide for systematising innovative practices that promote the development of students’ transversal skills in higher education (HE) in general, and especially in healthcare and social care. Specifically, we believe this will offer a useful methodological guide that can **help lecturers i) to plan transversal skills; ii) to integrate them into their teaching activities, and iii) to evaluate for improvement** of undergraduate and postgraduate students in these skills.

This guide is one of the main products developed as part of the European Project Erasmus+ KA2: Cooperation for Innovation and the Exchange of Good Practices, and of Erasmus+ KA203: Strategic Partnerships for Higher Education, based on the project "Integration of transversal skills into health and social care, higher education and the curriculum (ITSHEC)". ITSHEC is a transnational cooperation project between higher education and pedagogical innovation institutions, coordinated by Universitat Pompeu Fabra (UPF), in Barcelona, Spain. The partner institutions are the ESIMar Nurse School of Barcelona, the Metropolia University of Finland, and the Split University of Croatia.

Transformation and adaptation to a changing environment are constant in today’s societies, in which professionals must actively maintain learning to learn skills to adapt to change and complexity. In the current situation, and in the future, the healthcare and social professions face the challenge of acting in complex and unpredictable situations, including an ageing population, epidemiological transition to chronicity, the COVID-19 pandemic outbreak, and increased social inequality and associated vulnerability, among others. These challenges require professionals who can analyse situations using critical and creative thinking, who make decisions based on handling large amounts of information and involving the patient/user, and who manage the situation with appropriate interpersonal and emotional skills.

In this context, the ITSHEC project aims to improve the training of healthcare and social services professionals in transversal skills throughout the undergraduate and postgraduate training journey, starting with this guide.

The first part of the guide is a **Pedagogical Framework** that includes the TS dimensions as well as their gradation and levels. This section aims to support the planning of training activities that are specifically intended to work on TS. The level scale seeks progressive and continuous incorporation of TS training throughout the overall academic and professional journey. It also facilitates a student-centred approach, as it allows the starting point for each student (individual level of development) to be taken into consideration for assessment.
The guide includes six teaching-learning methodologies—problem-based learning, simulation, role-playing, gamification, virtual reality environments, and cooperative learning strategies—that are suitable for enhancing these skills, as well as methodological aspects to be considered when the training goal is to foster the development of student TS. This part of the guide intends to provide new ways of carrying out teaching–learning strategies that have been used for a long time in higher education (HE) but not specifically for promoting TS. This consideration should make it easier for teachers who want to start to include (or to deepen) TS in their daily practice.

This guide also brings specific content about including a gender perspective into the teaching and learning process. Gender mainstreaming is a fundamental aspect of the quality of the education provided. Teaching with a gender perspective stimulates students’ critical thinking capacity and provides them with new tools to identify social stereotypes, norms, and roles related to gender.

The guide then focuses on methods and tools for assessing transversal skills by including a methodological framework for evaluating the development of students’ TS. Specifically, this framework uses a multimethod approach that integrates the main types of assessment and perspectives (student, teacher, peer-to-peer) and tools (rubrics, checklists, scales, evaluative argumentation, portfolio, etc.). It explains how to plan, design, and use the different methods and tools for evaluating TS. The inclusion of an evaluation framework in this guide is particularly relevant, as it will facilitate the incorporation of evaluation into the design of the training activities.

Finally, as the ITSHEC project views cooperation and co-creation as key, this guide presents a final chapter with the results of focus groups with more than 30 students from different areas of healthcare and social care studies (medicine, nursing, dental medicine, human biology, social sciences, social work, etc) and from different European countries. The main objective was to explore their engagement and preferential teaching–learning approaches, in order to adapt and optimize the educational content and methodologies.

We would like to end by emphasizing our firm commitment to improving students’ TS, which we believe enables them to become better professionals, creates a more unified and just community, and strengthens and humanizes the doctor–patient relationship.
1. Pedagogical Framework

Eija Raatikainen & Katriina Rantala-Nenonen

Introduction

Transversal skills (also called soft skills, key skills, core skills, or transferable skills) (1) are crucial to lifelong learning and are essential for promoting active and involved European citizenship in civic and social life. Lifelong learning is defined as “all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective” (2 p9). They are transferable for many fields. Transversal skills can be achieved in both formal and informal contexts. For example, OECD countries have started surveying pupils on social-emotional skills, but this is still missing in the higher education (HE) context.

Both international and national agencies have stated the need to shift the focus towards teaching learning strategies that work on transversal skills throughout the training journey. These competencies are also important in tackling gender inequities and strengthening interprofessional cooperation in health and social care, thereby ensuring that the HE system does not prolong entrenched gender biases.

One of the gaps identified in the European Higher Education Area (EHEA) is a lack of implementation of teaching–learning strategies to work on transversal skills throughout the overall educational continuum in healthcare and social care. This situation relates, among other factors, to the absence of a framework that defines the gradation of the process of skills development: although there are numerous classifications and definitions, it is necessary to establish a gradation by levels that state the degrees of skills development and associated specific learning outcomes. In this sense, the aim of this pedagogical framework is to support the transversal skills teaching and learning process in the context of healthcare and social care (in HE).

This framework focuses on three key transversal skills: a) interpersonal/socioemotional, b) creative thinking, and c) learning to learn. This pedagogical framework is intended to support lecturers who strive to implement transversal skills training into their subjects, courses, and modules. Additionally, the guide aims to support planning the courses, specific activities, and learning outcomes that are intended to work on transversal skills. For each skill, different areas are defined with their respective learning outcomes.

We have designed and formulated this pedagogical framework, as well as defined and delimited skills (see Table 1 and Annex 1) based on previous reports, studies, pedagogical references, and European qualifications frameworks, and especially on the European Qualifications Framework (EQF) (3), which promotes lifelong learning, and the Finnish National Framework for Qualifications and Other Competence Modules (FiNQF) (4). This
pedagogical framework offers practical and descriptive guides to plan transversal skills into training activities, with the aim of improving the students’ transversal skills. In addition, the guide will help HE institutions as well as lecturers in healthcare and social care to review their curricula and then to design new programmes, courses, and modules that incorporate the development sequentially and progressively.

This framework can also be useful as a guide for learning and teaching in practice (see the Methodology part of the guide). The perspective is consistent with a social constructivist pedagogical approach and a student-centered approach, while at the same time helping lecturers to learn how to teach transversal skills. In this pedagogical framework, we have defined and explained one of the suitable pedagogical theories for teaching and learning transversal skills, levels of development of the skills (Tables 1-3 and Annex 1), as well as levels of progression for improving students’ transversal skills (Table 4), to provide continuous incorporation of transversal skills training throughout the overall academic and professional journey.

**Key elements for developing transversal skills: a student-centered approach and social constructivism**

Transversal skills cannot be learned on their own. In fact, the opposite is true, since they are skills that must be achieved in a social context with other people. For that reason, these skills are often taken for granted in the educational context in general, and there is evidence that more attention needs to be placed on these skills in the HE context specifically (5).

According to social constructivist learning theory\(^3\), learning is a collaborative process, which means that the role of social interactions and active participation are extremely important for constructing knowledge. This perspective of the transversal skills is also related to the zone of proximal development, which states that there is a distance in the learning process between the actual developmental level determined by independent problem solving, and the potential developmental level determined by problem solving in collaboration with others. Acting next to the zone of proximal development in social interaction can provide an improvement in learning.

It is clear that social interactions are key for learning some transversal skills, such as interpersonal and socio-emotional skills; however, they are also important for other transversal skills addressed in this project, such as critical and creative thinking, and learning to learn; indeed, it is important to note that social interaction also plays a fundamental role in the development of cognition (6). When thinking about teaching and learning transversal skills, it is also important to understand that the roles of culture, shared interpretations, and shared understanding of reality are crucial. Therefore, the social constructivist learning theory can offer important pedagogical basics for improving transversal skills, especially because of the importance of social interaction during the learning process. To achieve this objective, there are many methods, tools, and approaches to developing transversal skills.

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\(^3\) Social constructivism has developed from the ideas of Piaget, Vygotsky, Bruner, and Bandura; see Pritchard & Woollard, 2010, for overview.
From a pedagogical perspective, it is also relevant to consider student-centered learning in order to first teach students transversal skills and then to support them in improving their transversal skills. There are two broad orientations in teaching: i) “the teacher centered/content-oriented conception and ii) the student centered/learning oriented conceptions” (7). The student-centered learning perspective states that the knowledge is constructed by students, while the lecturer has the role of being a facilitator of learning; this includes elements like flexible learning (8-9), self-directed learning, and experiential learning (10). Additionally, three types of social interactions have been recognized as key aspects of learning: a) interactions with peers, b) interactions with a more experienced person, and c) interactions with oneself.

Several authors (7,11) have noted that student-centered learning should incorporate the following:

- A reliance on active rather than passive learning;
- An emphasis on deep learning and understanding;
- Increased responsibility and accountability on the part of the learner;
- An increased sense of autonomy in the learner;
- An interdependence between teacher and learner;
- Mutual respect within the learner–teacher relationship;
- A reflexive approach to the teaching and learning process on the part of both the teacher and the learner.

**Defining learning outcomes for transversal skills**

The first step in planning any learning process, including learning transversal skills, is to define the learning objectives to be developed. For this, it is important to define the expected learning outcomes, the knowledge, and the skills and competences to be developed.

**Learning outcomes** are measurable, and refer to the statements of what a learner knows, understands, and is able to do on completion of a learning process; they are defined in terms of knowledge, skills, and competence.

**Knowledge** means the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories, and practices that are related to a field of work or study. In the context of the EQF, knowledge is described as theoretical and/or factual (3). **Skills** refer to the ability to apply knowledge and to use know-how to complete tasks and solve problems. In the context of the EQF, skills are described as cognitive (e.g., involving the use of logical, intuitive, and creative thinking) or practical (e.g., involving manual dexterity and the use of methods, materials, tools, and instruments). **Competence** means the proven ability to use knowledge and skills, as well as personal, social, and/or methodological abilities, in work and/or study situations and in both professional and personal development.
In the context of the EQF, competence is described in terms of responsibility and autonomy (3 p11). Additionally, competence can be defined as “Managing and transforming work or study contexts that are complex, unpredictable and require new strategic approaches. Additionally, a person take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams” (3 p13). Furthermore, it can be said that competency is the “ability to apply learning outcomes adequately in a defined context (education, training, work or professional development)” (12 p47, 13).

Development of transversal skills

Although transversal skills are the subject of several Erasmus+ projects, there is a need for an academic discussion in the field of healthcare and social care sciences. In this framework, innovation lies in aligning the levels of the development of skills with their respective learning outcomes.

The chosen transversal skills that were developed in this guide were based on EQF and its adaptation in Finland (FiNQF), as mentioned above; this is related to the skills required in Master’s degrees. We believe that it is important to have a common European framework, as we are living in a time in which professionals with HE degrees are able to work in different EU countries.

These two European qualifications frameworks, at this level, cover comprehensive and highly specialized concepts, methods, and knowledge corresponding to the specialized skills within respective fields, which are used as the basis for independent thinking and/or research. At the EQF7 level, the learning outcome expected is to understand issues that are at the interface between different fields and to critically evaluate them together with new knowledge. Further, at this level, one should be able to use tools for solving demanding problems creatively, in research and/or innovation, in order to help develop new knowledge and procedures and to apply and combine knowledge from various fields.

In this guide, we chose level EQF 7 also for theoretical reasons: to understand which transversal skills can be achieved in ‘ideal world’ at an ‘ideal level’—in other words, they should not be made into the most relevant aims.

At the EQF 7 level, students should be able to (14):

- Work independently on demanding expert tasks in the field as well as in international cooperation or as an entrepreneur;
- Manage and develop complex, unpredictable, and new strategic approaches;
- Manage things and/or people and evaluate the activities of individuals and groups;
- Accumulate knowledge and practice in the respective field and take responsibility for the development of others;
- Continue with lifelong learning;
Consider communal and ethical aspects when dealing with different people in learning and working communities as well as with other groups and networks;

Communicate at a good level, both verbally and in writing, in his/her native language, to audiences both within and outside the field;

Be capable of demanding international communication and interactions in his/her field in at least one foreign language.

The following Table shows the dimensions that include the three transversal skills of the ITSHEC project (interpersonal/socio-emotional, creative thinking, and learning to learn) and the associated learning outcomes.
<table>
<thead>
<tr>
<th>Skill</th>
<th>Dimensions</th>
<th>Learning outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td></td>
<td>Able to express ideas clearly and fluently.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Able to use precise and descriptive/content-specific vocabulary to enhance the topic or message.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Able to share information in an organized and interesting way.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Able to share an analysis of the main message to interpret, synthesise and/or evaluate the meaning of the content in order to draw a logical conclusion about the topic.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Able to show empathy and use non-verbal communication and active listening.</td>
</tr>
<tr>
<td>Reflection and responsibility</td>
<td></td>
<td>Able to self-reflect, evaluate one’s own actions and emotions, and take responsibility for own actions. Has improved professional and social-emotional responsibilities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Able to perform tasks efficiently and carefully.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Able to persevere in the face of difficulties.</td>
</tr>
<tr>
<td>Relationships</td>
<td></td>
<td>Able to develop positive and emotionally safe interaction and to develop and co-create teamwork.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Able to reflect and manage emotional and self-regulation, and to show empathy in professional relationships.</td>
</tr>
<tr>
<td>Partnership, network, and cooperation</td>
<td></td>
<td>Able to work cooperatively with others: listens to others, incorporates what others say, encourages peers’ participation, engages in group decision making, helps peers selflessly, and accomplishes shared goals.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Able to act and cooperate with others autonomously under structured conditions, and to take account of various social roles and emotions in various contexts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Has the ability to build networks and partnerships in changing interprofessional and disciplinary (projects) teams and to innovate/reform it in a complex and unpredictable world.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Able to develop an empathetic leadership by understanding the needs of others and being aware of their feelings and thoughts, and to facilitate collaborative and participatory problem-solving.</td>
</tr>
<tr>
<td>Conflict management</td>
<td></td>
<td>Has the capacity to create a non-discrimination atmosphere.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Is able to facilitate conflict resolution, remain calm under pressure, and control one’s emotions in conflict situations.</td>
</tr>
<tr>
<td>Cultural sensitivity</td>
<td></td>
<td>Able to evaluate and develop one’s cultural awareness.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Has the knowledge, awareness, and acceptance of other cultures, and the willingness and capacity to understand people from different backgrounds and to embrace diversity.</td>
</tr>
</tbody>
</table>

Table 1. Transversal knowledge, interpersonal and socio-emotional skill, and learning outcomes in ITSHEC (for more detailed information, see Annex 1).
<table>
<thead>
<tr>
<th>Skill</th>
<th>Dimensions</th>
<th>Learning outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem-solving</td>
<td>Ability to identify and deal creatively with unexpected, unforeseen, and complex situations that can be exploited, and to evaluate different solutions.</td>
<td></td>
</tr>
<tr>
<td>Systems thinking/Interdisciplinarity</td>
<td>Able to recognize and understand relationships.</td>
<td>Able to collectively analyse complex systems; to think of how systems are embedded within different domains (society, environment, economy, etc.) and different scales (local to global); and to deal with uncertainty.</td>
</tr>
<tr>
<td>Critical analysis</td>
<td>Able to acquire, process, produce, and evaluate information critically and from the perspectives of different fields and decisions, taking into account both individual and community perspectives.</td>
<td>Has the ability to question norms, practices, and opinions, and to reflect on one’s values, perceptions and actions.</td>
</tr>
<tr>
<td>Creative thinking</td>
<td>Has the capacity to develop innovative solutions to answer different questions and to create new and worthwhile ideas; to elaborate and evaluate ideas in order to improve and maximize his/her creative efforts.</td>
<td></td>
</tr>
<tr>
<td>Sustainability</td>
<td>Able to apply different problem-solving frameworks to complex sustainability problems, and to develop viable, inclusive, and equitable solution options that promote sustainable development in the working environment with clients, patients, and other participants.</td>
<td>Has the capacity to apply the knowledge base and professional, ethical, and sustainable principles of his/her field as an expert (and developer of working life) in research, development, and innovation (RDI) activities.</td>
</tr>
</tbody>
</table>

**Table 2.** Transversal knowledge, critical and creative thinking skill, and learning outcomes in ITSHEC (for more detailed information, see Annex 1).
Table 3. Transversal knowledge, learning to learn skill, and learning outcomes in ITSHEC (for more detailed information, see Annex 1).

Level of progression in the development of transversal skills

There are many kinds of methods, models, and tools to support and follow students’ learning and progression of skills; in this guide, we present one of them. We give a general description of the level of the process in Table 4 (see also 15). Students’ skills development or progression can be split into different levels. The levels can be distinguished as foundation, intermediate, advanced, and expert; there is a large variance between students’ skills and competencies in practice. This implies that lecturers and teachers who are guiding students and helping them to improve their transversal skills need to take account these different perspectives. In other words, while students can manifest and utilize their skills for practice and everyday life, it is important to remember that these are very much connected to context and the timeframe; for instance, in some contexts, a minimum level of skills has been achieved, while in other contexts, it seems to be impossible.
In this guide, we offer this model for lecturers and students to reflect on and assess their progression. This model can be used while developing transversal skills. It is also possible to see it as an optional tool for assessing one’s own level of progression. Optional ways to categorize the level of student progression to level 7 are listed in Table 4.

<table>
<thead>
<tr>
<th>Foundation</th>
<th>Intermediate</th>
<th>Advanced</th>
<th>Expert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relying on support from others</td>
<td>Building independency</td>
<td>Taking responsibility</td>
<td>Driving transformation, innovation, and growth</td>
</tr>
<tr>
<td>Discover/explorer</td>
<td>Experiment</td>
<td>Improve/reinforce</td>
<td>Expand/transform</td>
</tr>
<tr>
<td>Recognizing phenomena</td>
<td>Recognizing phenomena from many different approaches</td>
<td>Transforming and applying for action and taking responsibility, valued oriented</td>
<td>Capacity to achieve excellence (in RDI)</td>
</tr>
<tr>
<td>Basic level of social and emotional sustainable</td>
<td>Intermediate level of social and emotional sustainable</td>
<td>Advanced level of social and emotional sustainable</td>
<td>Expert level of social and emotional sustainable</td>
</tr>
</tbody>
</table>

Table 4. Level of skills progression (15)

**Final considerations**

Transversal skills training allows linkage between undergraduate, postgraduate, and professional development stages in dimensions that should be enhanced; in turn, transversal skills training will continue during the professional development stages. The level scale (evaluation) seeks progressive and continuous incorporation of transversal skills training throughout the overall academic and professional journey. It also facilitates a student-centered approach, as it allows the starting point for each student (individual level of development) to be guided and assessed. This perspective is consistent with a constructivist pedagogical approach that seeks to work from the zone of proximal development of each learner. There are many methods to evaluate and assess transversal skills, but the key question that needs to be considered is: what is the purpose of this method, and does it support the most convenient way for a student’s transversal skills development? In this framework, we recommend using Tables 1-4 to ensure that this question is addressed.
References


13. ARENE. Suositus tutkintojen kansallisen viitekehyksen (NQF) ja tutkintojen yhteisten kompetenssien soveltamisesta ammattikorkeakouluissa (Recommendation on the application of the National Qualifications Framework (NQF) and common competences


ANNEX 1

More detailed transversal skills knowledge, skills and Responsibility and autonomy. In the context of the EQF responsibility and autonomy is described as the ability of the learner to apply knowledge and skills autonomously and with responsibility (15,16,17,18,19,20,21,22,23,24).

<table>
<thead>
<tr>
<th>KNOWLEDGE</th>
<th>SKILLS</th>
<th>RESPONSIBILITY AND AUTONOMY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly specialized knowledge, some of which is original thinking in a field of work or study as the basis for work or study (original thinking and/or research (* pp.12))</td>
<td>Ability to reflect and use thoughtful thinking in a decision-making situation. Ability to have a diverse approach (multidimensionality) in various everyday operations and R&amp;D activities. Ability for creative problem solving. Ability to apply an intuitive approach. Digital and social media skills. Can tackle disinformation.</td>
<td>Has the capacity to argue and to justify knowledge and skills. In the context of the EQF responsibility and autonomy is described as the ability of the learner to apply knowledge and skills autonomously and with responsibility (15,16,17,18,19,20,21,22,23,24).</td>
</tr>
</tbody>
</table>

**Critical and creative thinking**

- Comprehension of the target of critical and creative thinking
- Ethical theories and principles
- Creative theories and principles
- Digitalization of society and principles
- Sustainability
- Awareness of the significance of creative activities and art for the people
- Evidence-based knowledge
- Awareness of disinformation
<table>
<thead>
<tr>
<th>LEVEL 7 (EQF)</th>
<th>KNOWLEDGE</th>
<th>SKILLS</th>
<th>RESPONSIBILITY AND AUTONOMY</th>
</tr>
</thead>
</table>
| Interpersona/socio-emotional | • Awareness of theories of emotions and emotional intelligence (Goleman et al. 2017)  
• Interpersonal sensitivity (IS) (Hall et al. 2009)  
• Emotional and self-regulation and resilience  
• Mentalization  
• Qualified empathy and trust  
• Awareness of social roles and norms  
• Sensitivity to Interdisciplinary and inter-professional identity at work  
• Cultural knowledge, awareness, and sensitivity  
• Equality and equity, gender perspective | • Ability to keep up a good communication skills and to support others in interactions  
• Ability to advance social relationships and to create meaningful connections between people  
• Ability to express one’s own opinion with a good manner  
• Ability to understand social norms and roles. Interpersonal Accuracy skill (Schlegel et al. 2017)  
• Ability to show for a service-users or/and colleagues: caring, compassion, diplomacy, kindness, patience, respect, and sensitivity  
• Ability to handle demanding conflict situations  
• Ability to show optimism and hope  
• Ability to negotiate and use problem-solving skills  
• Ability to offer support and feelings of empowerment and participation to colleagues or service-users/patients  
• Cultural skills, motivation, and cultural interaction | • COMMUNICATION  
• Able to develop positive interactions and co-create teamwork  
• Able to show unconditional acceptance and use non-verbal communication and active listening  
• REFLECTION AND RESPONSIBILITY  
• Able to self-reflect, evaluate own actions and emotions, and take responsibility for own actions, to improve professional and social-emotional responsibilities (Slawinski 2013).  
• PARTNERSHIP AND NETWORK  
• Has the ability to build network and partnerships in changing interprofessional and disciplinary (projects-)teams and innovate/reform it into complex and unpredictable world (ARENE 2010)  
• CONFLICT MANAGEMENT  
• Has the capacity to create non-discrimination atmosphere and handle demanding conflict situation  
• CO-OPERATIVE  
• Able to act and cooperate with others autonomously, under structured conditions, and to take account of various social roles and emotions in various contexts  
• CULTURE  
• Able to evaluate and develop one’s cultural awareness |
<table>
<thead>
<tr>
<th>LEVEL 7 (EQF)</th>
<th>KNOWLEDGE</th>
<th>SKILLS</th>
<th>RESPONSIBILITY AND AUTONOMY</th>
</tr>
</thead>
</table>
| Learning to learn | • Goal settings  
• Learning techniques  
• Evaluation  
• Critical reflection  
• Self-regulation  
• Metacognition  
• Ability to transfer the knowledge  
• Digitalization of society  
• Non-formal learning  
• Lifelong learning | • Ability to identify learning outcomes, relate them to prior knowledge  
• Critical ability to select learning resources, extract the most relevant ideas, and know how to apply them in different contexts  
• Ability to evaluate both oneself and peers  
• Ability to use effective study techniques  
• Ability to partake in critical reflection  
• Able to meet learning challenges and to cope with them  
• Able to continue even when faced with challenging circumstances  
• Able to overcome potential (or actual) disappointment or being unsuccessful  
• Approaches new challenges in learning cheerfully  
• Has digital and social media skills  
• Able to act effectively in communities | • Able to evaluate and develop one’s expertise diversely and goal-directed  
• Has the capacity to bring into one’s system different behaviours, attitudes, and policies, and to work effectively to produce better outcomes  
• Confident and critical usage of information and communications technology in managing working life |
2. Problem-based learning for developing transversal skills

Mar Carrió

Introduction

Problem-based learning is a widespread methodology in higher education that uses realistic problems as a starting point for the learning process. Through the process of problem-solving inquiry, students develop specific and transversal skills. Thus, in small collaborative groups, students must analyse a problem, identify what they need to know to solve it, generate hypotheses about the possible solutions, and formulate relevant questions to guide the solving process. They should then search for information, select the best learning resources, discuss the selected literature with peers, and apply their newly acquired knowledge to evaluate their hypothesis. Finally, the students draw up a synthesis of their findings and reflect on what they have learned. During the problem-solving process, students self-direct their own learning with guidance from a tutor who has the role of a learning facilitator (1,2).

PBL was originally developed in medical schools to help students integrate basic science and clinical knowledge, as well as to develop clinical reasoning and lifelong learning skills (3). It was first developed at McMaster University in 1969 and has since spread to many higher education institutions and to a wide range of disciplines, becoming a methodology used worldwide (4). As a result, a great deal of research on PBL effectiveness as a teaching method has been done.

The studies show that PBL empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem. The main benefits of using PBL is that it promotes deep learning (5) and long-term knowledge acquisition (6-8). Moreover, there is strong evidence that it is also effective in developing transversal skills, such as teamwork, communication, self-regulated learning, and problem-solving skills (1-9).

Developing transversal skills through the PBL methodology

PBL is defined as a self-regulated learning method, which is a key dimension of learning to learn. This means that students are responsible for monitoring the problem-solving process, which includes setting the learning goals, drawing up a working plan, selecting and evaluating the learning resources, extracting the most relevant ideas and using them to develop possible solutions to the problem, and finally, reflecting on their results. Overall, this process favours the development of metacognition skills and increases motivation and engagement for learning (12).
Challenging students with real-life problems that are usually interdisciplinary allows them to develop critical thinking and creativity, as they have to analyse complex problems from different perspectives and disciplines and work out possible, innovative solutions. To this end, students must critically assess different sources of information, contrast them, and select the most appropriate for their goals. Moreover, as PBL promotes students to share their knowledge, experiences, opinions, and values with other group members, it facilitates the integration of multiple perspectives as part of the problem-solving process (13,14).

As learning takes place in a collaborative work environment, students can work intensively on teamwork skills that involve using interpersonal communication skills, responsibility, personal autonomy, and initiative and emotional management (among others). In fact, there appears to be a close connection between the opportunities provided by PBL for developing communication (teamwork and interpersonal), research (problem-solving and self-directing learning), and cognitive (critical thinking and inquiry) skills (15).

**Key aspects for the implementation of PBL**

The essential elements for implementing PBL are: i) the problem design, ii) the tutorial sessions, iii) the role of the tutor, and iv) the assessment.

**Problem design**

Problem design is probably the element that has the greatest impact on student learning. A good problem is the one that arouses students’ interest and has a positive influence on group dynamics, individual study, and academic results. Thus, a good “problem” is key for PBL to succeed (7).

Problems are contextualized situations in real-life scenarios that need to be better explained or solved (16). They are usually presented in a narrative format that sometimes includes images, figures, videos, and/or simulations. Problems should engage students, stimulate discussion, and generate questions; further, they should make it possible to work collaboratively and produce a desire to seek information to learn about the identified knowledge gaps and to dive deeper into the problem.

Previous studies have concluded that the problems that work best have the following characteristics: i) stimulate thinking, analysis and reasoning; ii) assure self-directed learning, iii) enable use of prior knowledge, iv) are set in a realistic context, v) lead to the formulation of appropriate learning goals, vi) arouse curiosity, vii) assure contextual breadth, and viii) choose an appropriate vocabulary. It is also recommended that texts are short and that unnecessary information is avoided (17).
Tips for writing problems:

- Include a story and humanised characters, to help to engage learners
- Include data to be interpreted in the form as pictures or figures, to stimulate reasoning
- Add controversial sentences that can help to start a debate among learners
- Use keywords to guide towards the objectives
- Provide a suggestive title to catch the students’ attention
- Use one (or more) of the different formats available: narrative texts, news, videos, art pieces, etc.

Below is an example of a problem used with 3rd year undergraduate students of human biology and medicine at the Pompeu Fabra University (UPF) (18). It shows the problem, the learning objectives, and the questions that students can ask themselves. It is important to note that students only received the problem (“An African tragedy”, first box below).
An African tragedy

Maria Tshabalala has not had an easy life. When she was only 2 years old, she lost her mother, who was already ill without knowing it when she conceived her. She never knew her father. She has been cared for by her grandmother, who also looks after her sisters and five cousins. They live in Soweto and depend on what they can pick up during the day. Some days she goes to school, and at a check-up she was found to be sick as well. They gave her medication that they don’t always remember to give her. Now she is worse. For days she has been very tired and has been coughing a lot. Her teacher is worried when she sees that when she coughs, she draws blood. She puts the thermometer on her and it is 100º.

Learning goals

The main objective of this problem is for students to learn more about the causes of AIDS, how it is transmitted, its cellular mechanisms, its relationship with tuberculosis and how to treat both diseases. Students are also expected to reflect on how socio-economic factors influence the acquisition and development of the disease, and to gain an overview of the epidemic.
The tutorial sessions

PBL is a collaborative learning strategy in which group dynamics play a key role. The teaching activity takes place in tutorial sessions. These are generally carried out with small groups of 5-10 students and a tutor who guides them. If it is not possible to work directly with small groups, the same can be done in a large classroom by breaking it down into several small groups of students, which can work simultaneously; in this case, the tutor goes around to give feedback to the individual groups. There are usually three tutorial sessions per problem (Figure 1). In the first session, the student groups are presented with the problem and then enter into a phase of brainstorming and discussions about possible research questions; finally, they draw up a work plan for the next session. In the initial discussion, it is important that students activate their prior knowledge, elaborate questions, agree on them, and identify aspects about the problem that they do not understand. This awakens situational interest, which occurs when people want to solve something that concerns them and are aware that they do not have the knowledge to do so. In other words, it should generate an interest for learning—which is what we are looking for in this first session. In the second session, students
share the research they have done and learn new knowledge from their peers. It is important that the tutor constantly challenges them to ensure that all students understand the topics being discussed in depth, both to maintain the situational interest and to raise new questions to be investigated or clarified in the next session. In the third session, the students conclude their findings and reflect on what they have learned and what will be useful for them in their future professional life. It is advisable for the tutor to ask them to prepare a report, a presentation, or a concept map in which they have to structure and synthesise what they have learnt.

For learning to be effective, it is important that the group works well together, which requires that all learners need to be able to participate equally and safely; to assure this, the tutor should promote a comfortable and stimulating learning environment. Tutorial sessions are an excellent opportunity to work on communication skills, teamwork, and critical thinking, and to provide frameworks for self-directed learning.

<table>
<thead>
<tr>
<th>Activities</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutorial session 1</td>
<td>Problem presentation and brainstorming</td>
</tr>
<tr>
<td></td>
<td>Identification of learning objectives</td>
</tr>
<tr>
<td></td>
<td>Drawing up a work plan</td>
</tr>
<tr>
<td>Autonomous work</td>
<td>Research to meet the work plan</td>
</tr>
<tr>
<td></td>
<td>Group work</td>
</tr>
<tr>
<td>Tutorial session 2</td>
<td>Sharing and discussion of the research carried out.</td>
</tr>
<tr>
<td></td>
<td>Generation of new questions</td>
</tr>
<tr>
<td></td>
<td>Elaboration of a new work plan</td>
</tr>
<tr>
<td>Autonomous work</td>
<td>Research to support the second work plan</td>
</tr>
<tr>
<td></td>
<td>Group work</td>
</tr>
<tr>
<td>Tutorial session 3</td>
<td>Drawing conclusions on problem solving</td>
</tr>
<tr>
<td></td>
<td>Synthesis and evaluation of what has been learned</td>
</tr>
<tr>
<td></td>
<td>Self-evaluation of teamwork</td>
</tr>
</tbody>
</table>

*Figure 1. A standard sequence of PBL tutorial sessions*

**Assessment in PBL**

PBL is a methodology oriented towards the development of competences. Therefore, it is necessary to look for assessment methods that are coherent with these educational objectives and to avoid traditional methods that only assess the acquisition of factual knowledge.

As stated above, one of the objectives of PBL is to develop students' self-directed learning. To do this, students must learn to identify learning outcomes, understand how to achieve them, and have opportunities to make mistakes and to learn from the mistakes. This means that a formative assessment is key throughout the PBL process; importantly, students must actively
participate in this process, through both self- and co-assessment. Thus, not only the teachers/tutors but also the students have to learn how to assess.

To assess the competencies that are developed in PBL, we can assess student performance in tutorial sessions through observational instruments such as grids or scales. It is recommended that learners participate in this evaluation through self- and peer-evaluations, which should be shared in a session to identify strengths and areas for improvement, both individually and as a group. To assess analytical and problem-solving skills during the course, the students’ assignments can be assessed through rubrics. They can also be involved by asking them to self-assess their work. For the final assessments, some PBL courses use the triple jump exam, an exercise in which learners (individually) can demonstrate their problem-solving skills. It is structured into three stages: 1) analysis of a problem and elaboration of a work plan, 2) student research, and 3) interview about the work plan (19,20). The Clinical Reasoning Problems (CRPs) have also been developed to assess clinical reasoning skills in individual students (21).

The teacher's roles and strategies to facilitate the learning process

Although the PBL methodology fosters self-regulated learning, this learning process needs guidance to reach its goals and to allow students to develop this set of skills and knowledge content; this guidance must be provided by a teacher / tutor / facilitator. In PBL, tutors are expected to facilitate or activate student learning and effective group functioning by encouraging the participation of all members, monitoring the quality of learning, and intervening when necessary. The tutor also plays an active role in scaffolding the students’ learning by providing a framework that can be used by students to construct knowledge on their own. Thus, the PBL tutor is crucial for ensuring the effectiveness of the learning process (22).

The tutor usually leads the group through non-directive questions, which help to evolve the ideas and knowledge of the learners. The following table (Table 1) describes some types of questions that tutors can make to support collaborative knowledge construction.
<table>
<thead>
<tr>
<th>Types of questioning</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soliciting ideas</td>
<td>Solicit ideas from the whole group on problems, facts, hypotheses, learning</td>
<td>Do you have any further comments on the data presented in the problem? Do you think there is an important idea missing?</td>
</tr>
<tr>
<td></td>
<td>issues, research findings, and recommendations.</td>
<td></td>
</tr>
<tr>
<td>Rephrasing students' ideas</td>
<td>Rephrase students' ideas in more precise language or make them clearer.</td>
<td>Are you talking about vitamin B12 and what happens when it cannot be absorbed? Are you referring to pernicious anaemia?</td>
</tr>
<tr>
<td></td>
<td>Recognising a student's contribution can be useful in influencing the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>direction of the discussion.</td>
<td></td>
</tr>
<tr>
<td>Pushing for elaboration</td>
<td>Ask students to elaborate on an idea.</td>
<td>I am not sure I understand that. Can you elaborate that?</td>
</tr>
<tr>
<td>Encourage the formulation of</td>
<td>Encouraging reasoning about causal mechanisms</td>
<td>Could you formulate what you are discussing as a hypothesis?</td>
</tr>
<tr>
<td>hypotheses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Checking for interpretation</td>
<td>Ask a student to confirm whether a facilitator’s interpretation of his or</td>
<td>Is that what you are saying?</td>
</tr>
<tr>
<td></td>
<td>her ideas was accurate.</td>
<td></td>
</tr>
<tr>
<td>Connecting to practice or</td>
<td>Relate the topics being worked on to practical experience.</td>
<td>Do you have any experience related to this issue? How does it relate to the practices you have done?</td>
</tr>
<tr>
<td>experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tossing back</td>
<td>Throw a question that was addressed to the tutor back to the group.</td>
<td>Can anyone answer that question?</td>
</tr>
<tr>
<td>Seek the consensus of the</td>
<td>Ask for consensus on what is written on the board or on the working plan.</td>
<td>Do you think all the relevant ideas are on the board?</td>
</tr>
<tr>
<td>group</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Describes some types of questions that tutors can make to support collaborative knowledge construction.

References


3. Clinical simulation for developing transversal skills

Meritxell Girvent, Pilar Larramona, Ana Codina Rodriguez and Maria Perez Riart

Introduction

Simulation in health sciences is a tool that creates a scenario that represents a real-world health situation, and it allows people to practice, learn, evaluate, test, and analyze actions in a safe environment (1). This learning methodology seeks to enhance clinical decision-making, while facilitating teamwork, reflective practices, and motivation for learning (2). Therefore, a specific scenario is proposed to the students, in which they must put into practice their skills and knowledge to solve a certain situation; the students' evaluations require active reflection about the decisions they made. It is important to emphasize that this activity provides a safe environment for the "patient", as it is carried out using a simulated patient, such as manikins or a standardized patient (either virtual or an actor) as well as for the participants. Thus, it allows the students to consolidate good practices and learn from their mistakes, without real-world consequences.

Simulation in the world of health sciences began in 1911, at Hartford Hospital, Connecticut, where life-size mannequins were used to train nursing professionals in skills such as dressing and mobilizing patients (3). In subsequent years, other manikins were created for training simple procedures, leading up to the creation of the Rescue Annie manikin in 1960, that was used to train the complex skills involved in cardiopulmonary resuscitation (4).

Simulation in training has evolved dramatically in the past few decades due to the vast improvements in computing technologies. For instance, computer programs can now be used directly in real mannequins, transforming inert mannequins into ones with "life-like" reactions that emulate both physiological and pathological real-patient responses. Additionally, virtual online patients were created in 2003, and, the first virtual hospital, the Ann Myers Medical Center, was inaugurated in 2007 (5).

It should also be noted that apart from mannequins, so-called standardized patients, who are actors emulating patients with a certain disease, can be used (1). Deciding whether to use standardized patients or mannequins depends on the case to be worked on.

The simulation methodology can be divided in three phases: pre-briefing, scenario, and debriefing.

**Pre-briefing:** This session takes place before the development of the scenario and acts as an introduction and orientation session aimed at all students or professionals who will participate in the simulation. The objective of pre-briefing is to create an environment of trust and to help the participants be prepared for reflective and participatory learning (1, 6).

Within the pre-briefing is the briefing, which takes place directly before the simulation and gives the participants the basic and essential information about the scenario. Specifically,
participants are given the details that are considered as necessary to know about the case they will simulate and about the physical space in which the case will take place; for instance, they might be told how a bed works, the location of medication, etc. The confidentiality of the entire process is also emphasized, guaranteeing the presence of a safe environment—which is the basic premise of this methodology (1, 6).

**Scenario:** The scenario represents the implementation of the case and must be prepared in advance, in accordance with the educational objectives previously agreed upon and taking into account the competence level of the participants (1). It is especially important that the setting is realistic.

**Debriefing:** The debriefing takes place immediately after the scenario has been finished and consists of a conversation among the participants themselves, as well as with the instructor, to review the event that took place in the scenario. Debriefing is an essential part of this learning method, in which the participants, guided by the facilitating teacher, analyze their actions and reflect on the roles of their thought processes, psychomotor skills, and emotional states within the scenario; this ultimately leads to improved learning of skills and behaviors (7). It also allows participants to discover their mistakes and comment them, feeling at all times valued and capable. It allows instructors to share their experience and make constructive criticism (7).

Recently, a classification method—the so-called SimZones—has been proposed for the different types of simulation-based learning programs, rated by their complexity (8). This allows the simulation design to be adapted to the profile of the participants based on the learning objectives we have set. Table 1 describes each of the zone levels (8).
<table>
<thead>
<tr>
<th>Zone</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learners</td>
<td>Individual</td>
<td>Partial team; groups of specialized learners</td>
<td>Partial or full clinical teams of all skill levels</td>
<td>Multi-professional teams (nurses, physicians, lab technicians, etc.)</td>
</tr>
<tr>
<td>Learning goals</td>
<td>Practice technical skills (isolated clinical content)</td>
<td>Practice basic clinical skills</td>
<td>Solve clinical problems in different contexts; it includes role-playing</td>
<td>Solve clinical problems in a multi-professional team</td>
</tr>
<tr>
<td>Scenario</td>
<td>None</td>
<td>It can start with or without a case</td>
<td>It starts with a clinical case. The scenarios are more complex and can include equipment and human interactions; they typically occur in real patient rooms or close simulations. Actors or high-fidelity mannequins can be included.</td>
<td>Presents a complex clinical case, such as with equipment difficulties and failures, human factors (including family/actors), and competing clinical indicators</td>
</tr>
<tr>
<td>Actions &amp; debriefing</td>
<td>Auto-feedback</td>
<td>The instructor provides feedback on the practiced clinical skill</td>
<td>The instructor provides mastery feedback and promotes reflection and development</td>
<td>Debriefing is guided by a trained facilitator and should foster the discovery of the assumptions and values that guided the team’s behavior</td>
</tr>
<tr>
<td>Examples</td>
<td>Practicing sutures and tying knots for medical students</td>
<td>Recognising the signs and symptoms of sepsis in a pediatric patient; learning surgical hand washing</td>
<td>Participants should know how to apply the proper protocol when faced with a patient in a septic shock</td>
<td>Describe personal plans for improving communication and team coordination during Stat Calls in the cardiac ICU</td>
</tr>
</tbody>
</table>

*Table 1. SimZones framework to design and guide clinical simulation development. Adapted from Roussin and Weinstock, 2017*
Developing Transversal Skills through Clinical Simulation

Simulation promotes not only training but also transfer of knowledge for future practices—which encompasses not only theoretical and practical knowledge, but also non-technical or transversal attitudes and skills (9,10). The following describes how we work the transversal skills of learning to learn, critical and creative thinking, and interpersonal and socio-emotional skills, which begins with a reflective process.

1. **Learning to learn**: One of the strengths of simulation as a learning methodology is that it allows the participant to put technical and non-technical skills into practice in a safe environment (physical and emotional). This premise is shared with the participants in the pre-briefing, in order to facilitate experimentation, reflection, and the co-construction of knowledge. The learning objectives are also shared. Finally, there are different roles in the scenario: the active participants (involved in the case) and the observing participants (observes from a different spot the development of the case and performance of the active participants). Once the case is finalized, we go to the debriefing phase, where we recall the premises mentioned above. The objectives of the session are also open to all those modifications that the participants consider appropriate. In other words, if they consider that an event has taken place during the case that has gained special relevance, there is the possibility of adding it to the learning objectives, to better address it and reflect on it on a future session. On the other hand, although there are different types of Debriefing, in the final stages of Debriefing the aim is to seek common conclusions, which allow to form the mental framework that has determined the performance of each participant, to establish common actions that ensure positive results in their professional practices. In addition, there is the possibility of evaluation and co-evaluation between participants, between participants and instructor, and even to the applied methodology itself (the developed session). All of this is essential to empower them and involve them in their learning process, since it enables participants to find different ways of acquiring knowledge, developing learning skills and modulating their attitudes (10,11).

2. **Critical and creative thinking**: The simulation allows the reflective process to be put into practice both in action (during the development of the scenario) and after the action (during the debriefing). This type of methodology not only enhances reflexivity, but also highlights its importance for decision-making and problem solving, which takes on special relevance during the development of the scenario, but specifically during the Debriefing phase. Throughout the debriefing phase, using both reflection and dialogue, individual perspectives are shared, exploring the actions developed during the scenario (what has happened and what is the mental framework that has led to each decision and action, what were the values and prejudices implicit in their own actions, etc). Also, possible solutions to the problems that have emerged during the case are shared, and, in a collaborative way, they reflect on them to find the most appropriate and effective in terms of positive results (10,11).

3. **Interpersonal and socio-emotional skills**: One of the key aspects of simulation is creating an emotionally safe environment, in which participants can express their feelings and points of view without feeling judged. Also, it provides an ideal setting for
developing communication skills, with both the patient and all the professionals involved in medical assistance. This is especially important considering that interprofessional communication is essential to understanding and practicing these different roles. Both interpersonal and socio-emotional skills are applied throughout the simulation; these can appear explicitly as objectives of the scenario and/or be implicit during the development of the case and the debriefing phase. It is common for more than one person to actively participate in the scenario. This means that the participants must work as a team, so that the bond established between them, as well as their communication skills and their attitudes, are key aspects for obtaining positive results from their practice. On the other hand, the debriefing phase is fundamentally based on sharing opinions, feelings, and emotions of the experience, in order to build knowledge as a group. Thus, once again, the relationships between participants (defined as the active and observer students as well as the instructor) play a fundamental part, with verbal and non-verbal communication gaining special importance, along with respect, empathic attitude, acceptance, and active listening (10,11).

**Key aspects for the implementation of clinical simulation**

In order to assure that the implementation of clinical simulation is successful, we must consider different aspects related to infrastructures, planning, and design of clinical cases, as well as the role of the teachers.

**Infrastructures:** It is essential to have the simulation classrooms equipped with the necessary material to emulate the scenarios that you want to develop (such as an outpatient room, a space for an emergency room, etc.), and it is essential to have technical personnel for the operation and maintenance of the room and computer equipment (12). It is also necessary that there be an adjoining room to be able to observe the simulation via streaming for the participants who are not on stage (12).

**Planning and design of clinical cases:** Prior to designing the scenarios, it is first necessary to define the learning objectives, the competences, and the level of difficulty that each of the cases will have, keeping in mind the competence levels of the participants. All cases must be integrated into the curriculum and into the schedules of each academic year, which implies good coordination and academic planning (12-17). Secondly, it is essential that the setting is as close as possible to the real environment that we want to simulate, in order to give maximum veracity to the situation that the student faces (14). It is important to make it clear to the students what the simulation is and what its limitations are (16), since it is not the same to deal with a real patient as with a simulated one. Along this line, the students should be reminded that what happens in a clinical simulation practice is not precisely the same as what can happen in real life. Third, and as we have seen previously, the immediate feedback that is given to the student to reflect on the actions carried out during the simulation is key to learning, so it is necessary to have all the tools (mentioned above) available (14,16,17).
Teacher’s role and strategies to facilitate the learning process

To carry out this methodology, the teachers play an essential role, as they help to guide and facilitate the learning process. Here are some recommended strategies to use to get the most out of the learning experience (18,19).

1. It is essential that the teachers who carry out simulations have received specific training on this methodology.

2. Participants should know the details of this tool before participating in it. To ensure this, we advise that the phases and dynamics of the methodology are explained a few days before the first session.

3. It is crucial that the simulation phases are respected. In the pre-briefing, it is essential to create a climate of trust so that the students feel comfortable, motivated, and want to participate and learn. Further, the teacher should encourage the observation, reflection, and participation of the students in both the scenario (even if they are not active participants) and the debriefing.

4. Conduct the debriefing: first, the participants must be able to say how they feel and express their emotions, in order to begin to explain the events that occurred during the scenario and to relive the moment. It is essential that the teachers ask questions to find the reasons for the decisions that the participants made, to reinforce the successes and reflect on the mistakes and thus promote learning and self-reflection. At the end of the session, each participant is invited to discuss about something that they learned during the session (18,19).

References


4. Role playing for developing transversal skills

Susana Sánchez Quinto & Teresa Vives Abril

Introduction

Role playing is an experiential teaching–learning strategy that encourages student participation (1). By proposing different cases and scenarios, the students must develop specific roles (different from their own), with the aim of acting out the situation. This methodology allows the student to live an experience, which can then be used by both active and observer participants as a point of reflection, in order to increase their learning (2-4).

The origin of role playing lies in psychodrama, which in turn is inspired by improvisational theater. It was conceived and introduced by Moreno (2) as “deep group psychotherapy” and was recognized from the start for its potential in treating both groups and individually. This highlighted its applicability to therapy as well as also to education.

Some authors, in order to differentiate pedagogical role playing from therapeutic role playing, refer to the former as: “… a way of acquiring experience on the interactions between the different roles of human beings and of these with animate beings and inanimate objects. The purpose is to learn, and to learn how to learn, about these areas” (5).

The pedagogical role-playing strategy is based on the following theoretical basis (4):

- The theory of learning through play, which allows a person to grow and learn throughout their entire life, is a continuous process that incentivizes the flow between the bodily and the emotional.

- The theory of the scene, which states that the situation presented will always develop as a scene in which the relations between characters (present and/or absent) are explored in a certain space or in a defined environment.

- The theory of roles, which states that a person acts as a bio-psychosocial being and reacts, according to the scenarios and circumstances, by adopting different roles.

Role playing can be classified based on the degree to which they were planned, as having a structured, semi-structured, unstructured, or mixed format (Table 1) (6).
<table>
<thead>
<tr>
<th>Role-playing format</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structured</td>
<td>Speech and scene: concrete and closed</td>
</tr>
<tr>
<td>Semi-structured</td>
<td>Speech and scene: open and flexible, with a short and barely defined script</td>
</tr>
<tr>
<td>Unstructured</td>
<td>Assignment of roles without prompts</td>
</tr>
<tr>
<td>Mixed</td>
<td>Combination of previous characteristics</td>
</tr>
</tbody>
</table>

Table 1. Role-playing formats and characteristics (6)

Placing a person into a certain setting to resolve problems can be very useful for training future health professionals. And although role-play and its learning benefits were studied in previous reviews and interventions (7–11), the projects of Zhu et al. (12) and McGregor et al. (13) have really underscored the effectiveness of role playing in the field of experiential learning.

By developing these contextualized roles and allowing students to make decisions in an experimental environment that resembles reality, the students can perceive the importance of not only theoretical knowledge but also other skills and / or competences, including communication, interpersonal relationships, the importance of non-verbal language, and empathy (2,3).

**Developing transversal skills through role playing**

Using role playing in the field of education can help students develop transversal skills and competences, such as learning to learn, critical and reflective thinking, interpersonal and socio-emotional skills, communication, and behavioral skills (3).

Advantages of role playing:

- Helps students to be motivated and interested, and to actively participate in their own learning.
- Rewards learning to learn and learning by doing.
- Stimulates creativity and learning by discovery.
- Favors reflection, group interactions, and problem-solving.
- Permits the expression of feelings.
- Facilitates the acquisition of communication, leadership, and teamwork techniques.
- Helps students to learn in a more meaningful manner.
• Allows students to develop argumentative skills that favor critical thinking, as well as dialogic and cooperative learning (14).

Learning to learn

One of the main benefits of educational role playing "... is to learn and learn to learn about these areas" (5). In the activities, the students—the focus of the educational process—actively participate in the construction of their own learning. From this, they learn attitudes, skills, actions, techniques, and habits that they can later use in their personal and professional lives (8).

"The participants or students are the true protagonists of their learning; they have to make decisions to solve certain problems that are posed, or to experience a specific reality, in order to better comprehend that situation" (16).

The objective is to encourage students, who take a leading role throughout the process, to actively participate in the construction of their own learning, by putting their knowledge and strategies into practice.

Garcia-Carbonell and Watts (17) also argue that “the possibility of living a risk-free experience in a situation under a real or simulated setting nourishes a teaching approach based on learning by doing”.

Through this process, students learn through the decisions that they make, obtaining experience-based knowledge without risk that can help them in their professional fields. Therefore, this process promotes not only learning by being told knowledge but also learning by doing and learning by becoming.

Socio-emotional interpersonal skills:

In role playing, students have the chance to take on the role of a person in a specific situation, which favors the development of interpersonal skills and attitudes such as empathy (4,18). Further, role playing allows the students to explore the feelings, attitudes, values, and perceptions that influence their behavior, while being required to consider and accept the roles of others. This helps to develop an empathic attitude towards others as well as to acquire social skills such as assertiveness or emotional management.

Overall, these skills—acquired by experiencing how other people can feel—will allow them to develop in the future. For instance, by recognizing attitudes, values, behaviors, and/or feelings of other people, students will be able to evolve as people, which can help them to achieve greater personal and collective growth. Critically, based on experience using this method, we now know that they will also be better in both learning and remembering, as they connected to the knowledge on an emotional level.

Taylor (19) states that these activities are characterized by the ability to create teaching–learning situations that enhance creativity, dynamism, and multidisciplinarity, and that based on a direct engagement, that stems from empathy, students can acquire a better understanding of spatial phenomena or processes with a greater involvement in becoming aware of their own attitudes.
Critical and creative thinking

Through experiences, students can learn and share knowledge, information, and behaviors, and thereby form new ideas through critical thinking. This is helped by the conscious and unconscious efforts that stem from their own experience and previous learning, allowing them to first place themselves in a different situation and then to attempt to better understand why other people act as they do (20).

Key aspects for the implementation of role playing

Planning for role playing requires completing a series of phases for its proper development:

1. Preparation: describe the role playing setting and/or situation in which the students are placed, and define the roles they will play. Consider setting a time limit of 20 minutes (at most) for the participants to enter the scene, develop the assigned role, and immerse themselves into the scenario. It is important that the scenarios and roles are based on the day-to-day experiences in which professionals encounter in their work life. The difficulty and complexity of the scenario, and the number of roles that must intervene, should be based on the level of preparation of the students.

2. Rules: explain in detail the conditions and rules of the role playing scenario.

3. Presentation of the scenario: this helps to prepare the students, and to get them acquainted with the process, topic, or problem that they will addressed.

4. Role distributions: choose students (by lottery, randomly, or by volunteers) to play the parts of the active and observing participants.

5. Game play: the game play should be carried with the utmost respect for what happens. The rest of the students should be attentive to how the scenario progresses and resolves, how the active participants use arguments as well as their verbal and non-verbal language, and the final conclusions that are drawn.

6. Conclusions and closing of the experience: start the conversation with the active participants: ask them what they thought about the scenario and how it made them feel, and delve into whether they believe that they reached an adequate solution to the problem. Next, ask the observing participants to analyze, reflect, and discuss what happened in the scenario (emphasizing the importance of being respectful to what happened), and then ask students about other possible solutions. Attempt to stimulate the richness of the different positions and views that the students can have when challenged with the same problem (21).

Student learning occurs from the staging, dramatization, representation, and improvisation of the scene proposed by the teacher. Representing specific characters in a defined setting allows students to mobilize their resources to face the difficulties proposed by the scenario. Putting the students in someone else’s place can: i) help them to better understand certain situations, opinions, behaviors, and attitudes; ii) give them better self-awareness; and iii)
stimulate their creativity, intuition, improvisation, and imagination that allows them to respond to the situation.

The roles and strategies of the teacher and students that can facilitate the learning process

The teacher’s roles

- Define the objective of the exercise. Clarify that role playing is NOT equivalent to "doing theater".
- Design scenarios for role play based on feasible experiences or real situations—keeping in mind the objectives of the exercise and the content that should be addressed.
- Adapt the scenario to the characteristics of the space (classroom, living room, outdoor space) in which it will take place.
- Prepare the activity rules for the students as well as the role of each participant.
- Assign the role of each person in the scenario. It is advisable to have groups of 4 to 6 students, and that participants choose the groups themselves, to ensure a good group dynamic.
- Properly manage the time during the game play.
- Aid the students: solve any doubts that they have, help them to overcome obstacles, manage the classroom, stimulate the exchange of ideas and teamwork, and control the time invested in each phase of the activity (5).
- Guide the students’ reflections without influencing their knowledge production process—let the students discover it for themselves.
- Give feedback: evaluate, analyze, and reflect on the results obtained from the experience by the members of the group, the viewers (who should also take an active part in the feedback), and the exercise facilitator. This dialogue can help the participants to arrive to even better decisions—keeping in mind of course that there is not a single "correct" answer. Indeed, each new situation will require that the students organize a new response. Each new situation will challenge the student to question the best response.
- Have each role-playing participant reflect on his/her acquired experiences and learning.
- Ask questions such as: What did you learn from the experience? How was the group dynamics? How did you feel while role playing? Would you now change any of your decisions? What do you think would have happened if you would have acted out these changes? In a real situation, do you think you would have responded in the same way?
Collect feedback, such as the impressions and feelings of the participants.

Evaluate the game playing either together and/or individually; various methods can be used, including rubrics, individual portfolios, and/or self-evaluation templates (in which each member of the group evaluates the team's work), among others.

The student's roles

- Adopt and internalize the assigned role.
- Know the objectives and methodology of the role playing activity.
- Own your learning! Be very active throughout the experience and make the decisions that you consider to be the most appropriate according to your knowledge and criteria.
- Be autonomous and involved in the game play.
- Develop your critical spirit, be reflective, and work freely.
- Learn from others as well as from the results obtained.

"Student learning" does not only take place at the end of the session—rather, the entire development process of role playing itself becomes a learning process (22-25).

References


5. Gamification for developing transversal skills

Ana Codina Rodriguez & Maria Perez Riart

Introduction

Gamification is a teaching–learning strategy that began to be used in the 1970s in business environments (1,2). Initially, the term referred to “turning something into a game that is not a game.” But it was not until 2010 when the concept began to be adopted in the sense in which it is used today and became a technique used in multiple contexts (both academic and work, for multiple disciplines, and at all levels), with the aim of motivating and involving people in the development of specific behaviors and attitudes (3).

Although there is no single definition of the term "gamification" (3,4), it is understood as the use of game elements (5) outside the context of a game, with the purpose of improving and enhancing the learning results of students (6,7).

Differences between gamification, serious game, and game-based learning:

- Gamification consists of using game elements in non-game contexts to promote behaviors and attitudes that facilitate learning;

- Serious games are complete games, conceived and designed for educational purposes—that is, education (in its various forms) is the main objective of the game;

- Game-based learning is the use of games as a means of instruction (7–10).

The different experiences based on gamification in the field of higher education show that its use influences the motivation levels of students, which then increases their participation in activities as well as their acquisition and integration of the learning results. Further, gamification allows them to start a learning process that also trains attitudes of collaboration, commitment and flexibility (7-10).

There are multiple benefits to "gamifying" classes for learning. For instance, the experience: i) can generate both intrinsic and extrinsic motivation for the student, ii) provides a safe environment to learn, iii) promotes self-knowledge about one's own abilities, iv) informs the student about their progress, v) favors retention of knowledge, and vi) allows the integration of diverse players.

To gamify a learning activity and to create an experience for students, three main elements—the dynamics, the mechanics and the components—should be considered (3) (Figure 1).
Developing transversal skills through the gamification methodology

Gamification can impact students in numerous ways, including by enhancing their participation during activities, changing their behavior and attitudes, and helping them to acquire new knowledge and skills (11,12). Therefore, this type of learning dynamic not only favors the acquisition of the contents of the activity itself (e.g., calculus, anatomy, research methodology...) but also promotes the development of transversal skills (TS), including:

1. **Learning to learn**: One of the strengths of learning through gamification is the positive impact it generates on the motivation of the participants. This is a key piece to encourage self-regulation of their learning, allowing students to "advance at their own pace through personalized and timely feedback" (13).

2. **Critical and creative thinking**: Gamification illustrates that learning is a progressive process and is characterized by a design based on stages. At all stages (before, during, and after stages), the students have time to reflect, which helps them to find different solutions to the same problem.

3. **Interpersonal and socio-emotional skills**: This methodology is designed to provide an emotionally safe space to learn while also allowing social connections to be established, both of which directly influence the learning process for the students. During the game, the participants must work collaboratively to achieve a common goal. To achieve the objective, the team members must not only cooperate but also put their social skills into practice, starting with mutual respect, empathy, and listening. For this reason, gamified activities have
an implicit social learning, which is developed through communication, team decision-making, role distribution, leadership, argumentation, empathy, and respect (13).

It should be underscored that, through gamification, the three aforementioned competencies overlap and are worked on transversally throughout the learning experience, regardless of the main objective of the session. Furthermore, other TS, such as leadership, teamwork, and decision-making, are also learned.

**Key aspects for its implementation**

To design and implement a gamified learning activity, it is essential to: i) know the context; ii) know the level of the participants; iii) define the learning objectives; and iv) plan the experience. Based on the three stages of the experience, it is essential to determine the elements of the game and the resources necessary to gamify the learning activity (13).

**Game-based elements**

1. Rules and limitations (rules of the game): offer students the possibility of demonstrating attitudes such as honesty and respect.

2. Narrative (knowledge): helps to establish a common thread between different concepts and their acquisition.

3. Monitoring mechanisms (e.g., points for experience, levels, progress bars, and access to locked content): progress can be assessed during the learning process.

4. Mechanics of the game progress (choosing between different possible routes): students have the opportunity to apply creativity, make decisions and solve problems.

5. Results obtained (points, badges, levels...): these allow acquisition of skills to be assessed.

6. Teamwork (team competition, role play): this promotes leadership, collaborative work, decision-making, and problem solving.

7. Time (countdown): this motivates the optimization of resources, problem solving, and decision-making, and allows the efficiency of the entire process to be evaluated.

8. Restart (e.g., having more than one chance to perform a task): this increases TS training and knowledge consolidation and promotes resilience/tolerance to frustration.

9. Feedback: this promotes progress and learning. It can be immediate (at the end of each stage) or scheduled. In addition, it can be for each individual or for groups.
¿What resources can you use to...

- ...award badges?
  - BadgeMaker
  - ClassBadge

- ...introduce questions?
  - Kahoot!
  - Quizizz
  - Mentimeter
  - Plickers
  - Edpuzzle
  - Socrative

- ...group content?
  - Canva
  - Genially
Teacher roles and strategies to facilitate the learning process

In the gamification methodology, the teacher has four fronts of action:

1. Plan and design the experience: this will be key to its success.

2. Acquire the role of learning facilitator during the development of the experience, as it will be necessary to allow participants to enter into it.

3. Measure the progress of the participants during their learning process.

4. Collect and incorporate the improvement points detected.

To include gamification in educational activities, and once the action fronts have been defined, it is important for the teacher to take into account the following guidelines:

- Repeated experimentation: let the participant repeat the activity to overcome the challenge.

- Incorporate immediate feedback: this will help the participant improve their strategy and have a better chance of success on the next attempt.

- Increase the level of difficulty progressively, adapting each stage to the abilities of the participants to maintain motivation levels.

- Design different routes to achieve the objectives.

- Incorporate rewards and recognition activities (14).
References


6. Virtual Reality Environments for developing transversal skills

Luis Villarejo Muñoz

Introduction

Information and communication technologies (ICT) have always transformed our societies, able to generate a cultural revolution with consequences in all aspects of our lives (1). In the past few years, this digital transformation has been rapidly accelerated by the Covid-19 pandemic, with the potential of permanently normalizing the use of ICTs in education (2). In the current situation in which social distancing must be maintained, not only enterprises but also educational institutions must incorporate remote methods to keep up their activities.

A highly disruptive technology among ICTs is virtual reality (VR). As VR removes the need for physical contact, VR environments are emerging as an important learning methodology for distance learning; of note, however, VR is also relevant for life-long education. VR environments are virtual spaces, accessed through a head-mounted display, where different activities can be carried out, including learning. In fact, VR learning experiences can significantly increase knowledge retention (3).

VR environments take into account student-centered learning, which includes elements such as flexible learning (4), self-directed learning, active learning, and experiential learning (5). There are two main orientations for student-centered learning: i) the teacher centered/content-oriented conception; and ii) the student centered/learning-oriented conceptions (6).

The social constructivist learning theory can offer important pedagogical basics for improving transversal skills (TS) competences. This strategy also considers the importance of social elements of learning during the learning process, since social interaction and active participation plays a fundamental role in the development of cognition (7). Social interaction is also a key for learning TS.

In this context, the use of VR environments can be very effective to further develop TS. Recent studies² have underlined several advantages of VR learning as compared to non-VR learning:

1. **Retention**: VR yields an 80% retention rate at one year after training; in stark contrast, traditional training yields a 20% one after only one week.

2. **Confidence**: VR users are 275% more confident in decision-making for daily activities than traditional users.

3. **Emotion**: Immersive VR experiences promote empathy, resulting in 3.75× more emotionally-connected users.

4. **Focus and speed**: Learners using VR are 4× more focused than conventional, passive e-learners. Content is transmitted 4× faster, without any distractions.

VR belongs to what is known as immersive technology. Immersive technology comprises three main technologies, which are often confused:

1. **Augmented reality (AR)** allows the user to see his or her surroundings through the screen of a digital device (smartphone, tablet, smartglasses...) and augment it by combining digital assets at the top of the screen. The user interacts with the system by moving the digital device around, touching the screen, or using voice commands.

2. **Mixed reality (MR)** is often referred to as "vitaminized" AR. It allows the user to see his or her surroundings through the screen of a digital device (smartglasses) and to augment it by combining digital assets; importantly, however, it also allows the user to analyze the physical environment, to achieve a greater integration between digital assets and reality. The user interacts with the system via moving his/her head around, hand gestures, touching the smartglass trackpad, or voice commands.

3. **VR** uses a headset to allow users to isolate themselves from their surroundings and to become immersed in a totally different scenario. The user interacts with the scenario by moving his/her head around, using a hand controller, touching the headset trackpad, or using voice commands.

As all three terms make use of the word ‘reality’, they are often grouped under the common umbrella of the eXtended Reality.

Inside VR Scenarios, we can differentiate between two different families: i) the first one comprises VR experiences using digitally built environments in which the user is commonly represented by an avatar in a video game aesthetics scenario (Figure 1). While the second family comprises VR experiences using 360 video, where the user finds himself immersed in a highly realistic environment (Figure 2).
Developing TS using Virtual Reality Environments

VR environments provide students with the opportunity to be immersed in a highly realistic, vivential first-person learning experience that only requires a VR headset. Once the student puts on the headset, he or she is transported to the context relevant for learning. Inside interactive VR environments, the student will make decisions that will determine the course of the learning experience. With each decision, the student can receive feedback. All decisions can be recorded to further analyze the student’s behaviour.

Learning to learn: Rather than being the passive spectator of the learning material, this VR approach implements active and self-directed learning. Of note, this place the student at the center of the learning activity and allows the student to build his/her own learning based on his/her decisions and feelings. The student can go back at any moment to revisit parts of the learning experience or rollback already-taken decisions to compare different consequences. In this way, the student self-regulates his/her learning, which is a key dimension to Learning to Learn.

Interpersonal and socioemotional skills: VR scenarios can help to improve both interpersonal and socioemotional skills (and other similar ones). Communication, empathy, and conflict management are some of the best dimensions of interpersonal and socioemotional skills that can be worked out within VR scenarios.

For instance, imagine a situation in which a student plays the role of an employee who has been called to a meeting to explain a problem to his/her manager. The student needs to choose among three stereotyped managers, each one of which responds to a particular communicative style (aggressive, assertive, or passive). In this scenario, students choose and then practice which kind of messages generate which kind of situations, and how to deal with these situations.

VR scenarios are also ideal empathy enhancers, bringing students into roles that, in real life, would be difficult to find themselves in. For example, nursing students can play the patient role in an admission process, allowing them to attend the process from the “other side” of the counter. This allows students to experience first-hand feelings and emotions triggered by different situations. Even simpler, students can visualize first-person VR short films like “Carne y Arena”3, in which they become Michael Sterling, a black man, encountering racism as a young child, an adolescent, and a young adult.

Critical & creative thinking: Interactive VR environments are ideal for working on problem-solving skills. Students face complex multi-branched scenarios in which they need to make a series of decisions to solve a problem. Only one or a few scenario branches lead to a solution, so students must explore several of them while reflecting on the decisions that took them to that point. Students should be encouraged to perform a critical analysis of the situation, which can be further expanded in a debriefing once the scenario has been finished.

3 https://carne-y-arena.com/en
VR environments provide an effective way to develop TS (8,9). Having this form of learning available is especially critical in times when social contact is restricted, such as during the Covid-19 pandemic, and when traditional role-playing activities are difficult to carry out.

**Key aspects for the implementation of Virtual Reality Environments**

While VR environments could be applied to every single learning situation, doing so does not automatically guarantee an improvement in learning outcomes. Instead, we should look at VR environments as a complementary tool to be applied only when the vivential, user-centered approach and active learning component makes a difference as compared to other learning methods. For example, it makes a difference to learn communicative skills with a VR experience that situates you in the middle of a communicative conflict, in which you need to make decisions regarding your communicative style and are able to experiment with its consequences. The same applies to problem solving skills, leadership skills, teamwork, empathy, etc. As we have seen in the previous section, VR environments constitute an ideal tool that can help to improve TS.

Another key aspect regarding implementation is content availability. Access to VR environments can be achieved through specific apps or through video platforms, such as YouTube, Vimeo, or Facebook, which provide support for 360 degrees videos. To find VR scenarios in these video platforms, one must simply search for “360 video”, and hundreds of results will appear. Further, Google has created Youtube VR, which only holds VR videos that can be viewed in different ways.

If there are problems with content availability, we can always create our own VR learning experience. To do so, we need to plan the different steps involved in such a production. Planning a VR learning experience should start by defining the pedagogical goals. From here, we must define which scenarios and learning activities should be generated in order to help achieve these goals. At the same time, we must define the different personas that are going to play a role in the experience. Once we have that, the storyboard and plot must be developed, including the decision points and feedback for each one. Feedback must be provided at the right time. If feedback is given at a too early or too late time point, the scenario may lose learning its potential.

At this point, you can opt in for a 360° video learning experience or for a digitally built experience. If you opt for a 360° video learning experience, we need to share pedagogical goals, personas, storyboard and plot with the persons appearing in the experience and record it with a 360° camera. User 360° cameras are available for less than two hundred euros (EUR 200). Post-editon will allow us to cut out irrelevant scenes, add interactive learning activities (such as multiple-choice questions), and produce the final learning piece. This piece can then be distributed through video platforms or via a specific app for mobile devices or VR glasses.

If you opt for a digitally built experience, the experience should be coded using a game engine like Unity or Unreal (which are free for non-profit projects), to generate our VR environment with game aesthetics that include our interactive learning activities.
VR environments are best visualized with a VR headset. There are two main families of headsets:

- **Cardboard headsets:** To use this type of device, a smartphone needs to be inserted into the cardboard to provide us with a VR experience. The smartphone can then play a 360° video from YouTube, or a VR app can be installed to allow that experience. Cardboard glasses are very affordable.

- **Standalone headsets:** This device does not need another device to provide a VR experience. These devices provide a much better immersive experience because of the quality of their materials and lenses.

**Teacher roles and strategies to facilitate the learning process**

As mentioned above, creating a VR environment requires that several teacher roles are developed, depending on the kind of activity you want to carry on:

1. **Content curator:** Teachers must browse the internet looking for VR scenarios that can help them implement their planned activities. Note that this is not simply browsing but also test-using the VR experiences and reflecting on their potential to be used inside the classroom with a particular pedagogical goal in mind.

2. **Content creator:** Teachers can also create their own content using 360° cameras or game engines (such as Unity or Unreal).

3. **Hardware supervisor:** Teachers must make sure the headsets and/or smartphones are ready to support the VR experience. Batteries must be checked and, if necessary, software must be installed and ready to run the VR experience.

4. **Briefing:** Teachers must instruct students not only on the use of VR headsets but also on the dynamics of the learning activity that they want to carry out. Teachers should then inform the students about numerous things, including: i) the purpose of the activity, ii) the dynamics of the activity, iii) the role(s) that they will be assuming, iv) what other roles are present in the activity, and v) which actions they will be able to do in the immersive experience.

5. **Debriefing:** Teachers must prepare and conduct a debriefing at the end of the VR activity. This debriefing should be guided by the defined pedagogical goals and should be directly linked to the decisions the user made. A typical mechanism to achieve that is the retrospective, consisting of going through all the decisions the user made and analyzing why these decisions were made. This will allow for the student’s further reflection about the experience and the learning process and will also allow for higher competency achievement.
Visit the International Space Station, a VR activity example

We would like to briefly explain the Visit the International Space Station (ISS) activity as an example of a VR activity. This activity was carried out as part of the YoMo (The Young Mobile Festival), which is an event that is celebrated every year in Barcelona together with the Mobile World Congress. At YoMo, children and teenagers can find interactive workshops, shows, and many activities, all of which use the latest technologies. In this event, Spark Girls and Immersium Studio have previously designed and conducted an Immersive Learning Experience with the goals of promoting STEAM careers among twenty 14-year-old teenagers and of helping to reduce the gender digital gap in technical careers.

To reach that goal, we identified the ISS as an ideal scenario to bring the role of astronauts and scientists closer to the children. The idea was to make them face a challenge by completing different tasks as astronauts and scientists while feeling like they were actually at the ISS. We used cardboard devices and freely available 360° images and videos to virtually transport them to the ISS. Once they finished, we did a debriefing with them. We structured the debriefing to be retrospective about the decisions they made, which consequences they generated, and how they behaved to solve the tasks and problems they encountered. During the debriefing, we especially emphasized the importance of not only STEAM abilities but also communication and teamwork skills. Afterwards, we did the role switching, and a different challenge was presented, followed by the same stages mentioned above.

You can watch the experience teaser here: https://www.youtube.com/watch?v=fG3QGgJqx98

References


7. Cooperative learning strategies for developing transversal skills

Eija Raatikainen & Katriina Rantala-Nenonen

Introduction

Cooperative learning is a pedagogical practice that involves students working together to achieve goals that would otherwise not be achieved or completed working alone. It is recognized way to promote learning in different kinds of subject areas as well as to develop thinking skills, conceptual understanding, problem solving, reasoning, social skills, perspective-taking, and personal self-development (1-4). Indeed, teaching in small groups was already used by Socrates to engage students in dialogues (5).

Cooperative learning differs from temporary informal learning groups that usually last just one discussion (6). Cooperative learning has been separated into four rough categories: formal cooperative learning groups, informal cooperative learning groups, and cooperative base groups (7,8).

- Formal cooperative learning groups work together during one or more class sessions to achieve shared learning goals and to jointly complete specific assignments.

- Temporally informal cooperative learning groups are ad hoc groups that last for only one discussion or class period to achieve joint learning goals. Informal learning groups are used to focus student attention on the material to be learned, to create an expectation set and mood conducive to learning, to ensure that students cognitively process the material, and to provide closure to an instructional session.

- Cooperative base groups are long-term groups with stable membership whose primary responsibility is to give each member the support and assistance to progress academically and develop cognitively and socially (see Case 7.6 Appendix 1).

Students will derive both academic and social benefits when they work cooperatively in small groups of four or fewer members. Students are likely to achieve better learning goals when they are required to interact and share their resources (2,9-13). Group work of the students is the key issue. Aiming for and then achieving collective goals together requires, improves, and develops the students’ communication skills, social skills, and critical thinking skills (6,14). It is important to note however that teachers also play a significant role in establishing cooperative learning with the students (2).

Cooperative learning and the development of transversal skills requires that a student interact with other students as well as with a teacher. Cooperative learning is a good method to improve students’ transversal skills (16).
Developing transversal skills through Cooperative learning strategies

In cooperative learning, it is important to work together with other people as a group or a team. Achieving a common goal together with other students requires cognitive activities and interpersonal dynamics and therefore requires the development of critical and creative thinking as well as interpersonal and socio-emotional skills. Students must explain to each other how to solve problems, discuss the nature of the concepts being learned, teach one’s knowledge to classmates, and connect the present with past learning (6,8). This includes also discussions of arguments concerning different kinds of solutions with peers and the teacher. Interactions between students is placed at the center. In addition to critical thinking, this kind of study also supports learning to learn skills.

Positive interdependence and problem solving are in the focus of cooperation and learning. Positive interdependence means that the students’ work benefits each other. Students are linked with each other, so that they are not able to succeed if someone in the group does not carry their part of the task. Interdependence and problem-solving in heterogeneous and diverse groups help to develop critical and creative thinking as well as social skills; for instance, when students have their assumptions and arguments challenged by other students and/or a teacher, they are challenged to see and use alternative ways in problem-solving (2,17). Open-mindedness and an open attitude are needed to ensure a smooth collaboration.

The feedback and the assessment (evaluation) of the teacher, as well as peer review, are important for developing critical and creative thinking and learning-to-learn skills through this methodology. For example, having group discussions with peers and a teacher of succeeding in the group work and of development of transversal skills enables students to reflect and develop these skills further.

Key aspects for the implementation of Cooperative learning strategies

Cooperative learning requires that students work together (18). Establishing a successful cooperative learning situation that provides both academic and social skills requires five basic elements (6,8,17):

- Positive interdependence

Students work together to maximize the level of learning of all members, sharing their resources and providing mutual support. Positive goal interdependence can be established through mutual learning goals; for example, each student can learn the assigned material and then make sure that all members of that group has also learned the assigned material. In the end, students have a reason to celebrate their joint success.
Individual accountability

When students learn together, they can subsequently perform better as individuals, as well as work better with others. Cooperative learning groups seek to make each member a stronger individual. Therefore, it is important to know who needs more assistance, support, and encouragement in completing the assignment. It is also necessary to make sure that students cannot "hitch-hike" on the work of others. The performance of each individual student of the group is assessed, and the results are given back to both the group and the individual.

Face-to-face promotive interaction

Students encourage and facilitate each other's efforts to complete tasks and to achieve, in order to reach the group's goals.

Social skills

Students must sometimes be taught the social, interpersonal, and small-group skills that are required and to be motivated to use them. These skills are monitored by both teachers and peers. Individual feedback is therefore extremely important.

The social skills that facilitate students' interactions during small-group discussions include (2): i) actively listening to each other, ii) sharing ideas and resources, iii) commenting constructively on each other’s ideas, iv) accepting responsibility for one’s behavior, and v) making decisions democratically.

Group processing

Learning groups should both reflect on how well they are functioning as well as plan how to improve their work processes. The following questions can be used: What have we achieved? What do we still need to achieve? How might we do this? This reflection must be done periodically.

Implementing cooperative learning requires a psychologically safe learning environment, in which students feel safe to express themselves. This is a significant part of the learning environment. When considering key aspects of implementation of the transversal skills in teaching and learning, several elements should be taken into account, such as the following examples (14):

- Everyone is made to feel welcome
- Students help one another
- Staff (e.g., teachers) and students treat one another with respect
- Lessons are responsive to student diversity and accessible to all students
- Students are actively involved in their own learning
- Students learn collaboratively
Classroom discipline is based on mutual respect, and teachers plan, review, and teach in partnership with the students.

These elements need to be discussed together with the students, and all parties should make a commitment to follow them before and during the course.

In the following, we list some effective cooperative learning strategies that can be easily incorporated into lessons:

- **Think-pair-share**

  The teacher poses a question to the group. Each student has a short period to think about the question, after which they turn and discuss it with a student sitting next to them. Finally, they share their thoughts with the whole class (1,18). This strategy engages all students in their learning.

- **Jigsaw**

  The students are placed into "home groups" and "expert groups". Each group is assigned a different topic within the same general topic. Students research their topics with others who have the same topic (their expert group). Then they return back to their home group to teach them about their topic. In this way, all the pieces come together to form a complete product. (1,18,19)
Write-around

The students are placed in small groups, and the teacher gives each group a topic, whereby each topic has multiple answers or ways to be understood. Students write their response to the question on a piece of paper, shared by the group. After that the teacher tells the students to pass the paper to the next group, which then takes the time to read over what the other group members wrote, explain it further, or clarify what was written. The process is repeated throughout the group (20). This strategy allows all students to demonstrate their knowledge about a topic and to help fellow students by supplementing or clarifying their ideas.

The teacher’s roles and strategies that can facilitate the learning process

Teachers have a significant role in facilitating cooperative learning processes. When planning student guidance in cooperative learning, it is important for the teacher to recognize some basic elements of this learning method. For instance, teachers need to pay attention to not only self-regulation at the individual student level but also for the group process (21). On the other hand, there have been some barriers for group learning, such as students’ lack of social skills, free-riding, competence statuses, and friendships (22).

According to Gillies (2) and Johnson et. al. (7), a teacher’s role includes:

- Specifying academic and social skills objectives;
- Deciding group sizes (3-4 students in each group is recommended);
- Structure the groups and the tasks so that the students understand what they are expected to do and how they are expected to behave;
- Assigning roles: sometimes structuring student-student interaction by assigning roles is needed; roles can include reader, recorder, encourager of participation, and checker for understanding;
- Plan materials: arrange materials to give a “sink or swim together” message. Give only one paper to the group, or give each member part of the material to be learned;
• Explain the criteria for success: student work should be evaluated on a criteria-referenced basis. Sometimes joint rewards may be useful for strengthening positive interdependence; for example, if all members of the group score 90 percent correctly or better on the test, each student will receive 5 bonus points;

• Promote student interactions during small group discussions;

• Help students to interact and work together, to learn from each other, and to accept responsibility for the tasks they must complete as well as for the decisions they must make;

• Ensure that students carefully process the effectiveness of their learning groups: have students plan for improvement and celebrate the hard work of group members.

Cohen (12, see also 2) claims that the structures that foster group cohesion and motivate students are i) the importance of arriving at a synthesis of the student’s contributions, and ii) the expectation that the group product will be presented to the wider class. Gillies (2) has pointed out that during the cooperative learning process, the teacher facilitates and promotes the process by asking students to describe what kind of actions are helpful or unhelpful, how to continue, and what should be changed to ensure effective work. Teachers also play a role in eliminating unskilled and inappropriate actions and in improving the students’ skills in working within a group.

The teacher’s role is highly important also in dialogue teaching. Teachers may ask students to argue and then explain their arguments, to analyze and resolve difficulties, to speculate and hypothesize, to reason and justify. Teacher asks questions that challenge current understanding, build on the ideas of others so that they are linked together, and evaluate and reflect on outcomes achieved. Overall, this leads to students learning to listen more attentively to others and to sharing ideas and working to construct new ideas and knowledge together. Students learn to engage in “learning talk” (2,23). These are important aspects in developing transversal skills—that is, critical and creative thinking, social and interpersonal skills, and learning to learn.

References


Appendix 1

Case: Professional Growth Guidance Process in Master of Social Services Degree

Picture 1. Professional growth guidance process in Master of Social Services Degree in Metropolia UAS, during the academic years 2017-2020 (Rantala-Nenonen & Raatikainen 2022)
8. Including gender mainstreaming approach into the teaching–learning process

Marta Benet Blasco & Belén Valverde Alirangues

Gender mainstreaming in higher education has been embraced internationally as a strategy and policy that promotes gender equality. It can be defined as the integration of a gender perspective into the regular rules, procedures, and practices of an institution (1). This approach aims to i) promote equality between women, men, and other genders, ii) combat discrimination, and iii) overcome gender-blindness, and encourage gender-awareness, during the development of future professionals (2).

Integration of gender mainstreaming into higher education has a transformative purpose, at both at the individual and the collective level. It pushes for making society’s gender norms and inequities visible, problematized, and modifiable; of note, these norms and inequities also underlie society’s intersection with other axes of discrimination (including ethnicity, class, sexual orientation, and functional diversity). To this aim, implementing gender mainstreaming should lead to the transformation of the higher education institution, and thus also have an impact on the organisational culture (3).

A professional with gender equality competence requires commitment, methodological expertise, and specialist knowledge. "Commitment" implies recognizing gender equality as an aim of one’s work, and taking responsibility for the integration of gender mainstreaming. "Methodological skills" refers to the ability to implement gender mainstreaming with suitable methods, tools, and attitudes. Finally, "specialist knowledge" implies having a theoretical understanding that i) gender is a social construct and ii) gender norms and stereotypes are a product of the social and power structures (4). It is expected that healthcare and social care professionals who have gender equality competence place following practices as a keystone of their performance: i) provide care for all genders (women, men, non-binary, gender fluid, gender non-conforming, etc.) with competence, fairness, and according to scientific evidence; ii) read scientific literature through a gender-critical lens; and iii) take responsibility for tackling and eradicate discriminatory practices and situations of vulnerability (5).

Integration of gender mainstreaming in higher education: four key areas

Gender mainstreaming involves the integration of gender perspectives into four areas: 1) institutional policy and organization, and decision-making bodies; 2) curriculum design, including content, teaching-learning methodologies, and monitoring and evaluation activities; 3) everyday relationships and interactions; and 4) research and knowledge production.

The incorporation of gender mainstreaming at the institutional level should imply, at least, the reversion of four trends (6, 7): 1) the lower representation of women in higher education
leadership, 2) the gender-blind institutional policies; 3) the lack of public body supervision of the mandatory reforms; 4) and the presence of worse working conditions, gendered biased division of labour in the academia, and the few opportunities for career progression for women (and other "non-man" genders).

The curriculum can reinforce the status quo (gender inequality) or be a key asset to support transformations in gender relations and foster gender equality. To this aim, gender mainstreaming must be integrated across the curriculum instead of imparting superficial and punctual gender-based content (8). The revision of the curriculum should include changes in four key dimensions: 1) the inclusion of gender-responsible contents; 2) the definition of gender-sensible competencies, learning outcomes, and objectives; 3) the revision of teaching–learning strategies to promote equal participation and learning opportunities; and 4) the inclusion and recognition of women’s contribution to the discipline.

Regarding the content of the curriculum, the following aspects should be considered and included (5, 8-14):

- Theories about the sex–gender system and its impact on social, psychological, and biological dimensions.
- Social determinants of health and the impact of gender inequities on health.
- Behaviours and lifestyles that affect health and disease, and how gender roles influence these lifestyles.
- Sex and gender differences in the illness–wellness continuum: bio-psycho-social description of diseases; signs and symptoms; diagnosis and treatment options; prognosis; morbidity and mortality, and so on.
- Differences and stereotypes about diseases: for example, diseases that have the same prevalence but have traditionally been assumed to be single-sex (acute myocardial infarction), or diseases that are more frequent in women that embody many gender stereotypes (fibromyalgia).
- Gender-based violence: theoretical frameworks, social and health impact, detection, and intervention strategies.
- Approaches and strategies for formal care that are gender-responsible: need assessment, relational and communicational approaches, the inclusion of patient/ user experience, and design and implementation of the care plans, among others.
- Differences and inequities in informal care: this pertains to the people cared for as well as people who provide care, informal care networks, other axes of inequality related to informal care, etc.
- LGBTIQ-inclusive approach: eradicate any form of discrimination and bias around sexual orientation or gender identity in the educational materials, for instance by

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4 Note that sex refers to one's biology and is usually assigned at birth (e.g., female, male, or intersex), while gender is a social construct and can be fluid (and is non-binary)
including content and examples that show and promote diversity, and eradicating any LGBT-phobic wording or expressions.

- Awareness of sex/gender biases and sex/gender blindness in the available scientific evidence, and its consequences for the professional practices.

- Subjectivity and social constructions related to masculinity and femininity ideals that play an important role throughout the illness–wellness continuum.

The incorporation of all this content should go hand-in-hand with the creation of educational materials that replace those that are gender-blind and gender-biassed. This includes, for example, being critical of the number and type of images that appear in those materials, or reviewing the family models and/or professional and domestic roles portrayed when explaining an example or case.

Likewise, the availability of gender-responsible content for teaching–learning activities is intrinsically related to the recognition of women’s contribution to the discipline. This includes having a gender balance in the bibliographies used in the syllabus or course programmes, and displaying an author’s full name in the reference list to make visible women’s contributions, which have usually been ignored or given less consideration (7).

The teaching–learning strategies are closely linked to the third area of action: everyday relationships and interactions within the institutions, which include all the educational ecosystem: education managers, professors and lecturers, students, administrative staff, and any other relevant stakeholder. Through everyday interactions, we can either reproduce the hegemonic dominant practices (usually gender-blind and patriarchal), or we can act differently and disrupt those taken-for-granted practices that contribute to maintaining power structures and making gender norms unquestionable.

Specifically, the implementation of gender-sensitive teaching–learning methodologies is extremely influenced by formal and informal relationships as well as by the interactions within the classroom or any other educational setting (such as simulations labs or clinical training). Thus, when creating a gender-responsible learning environment, several aspects should be considered:

- Verbal and non-verbal language is one of the most important ways to reproduce social representations about gender. It’s crucial to review our language, to ensure that it is inclusive and to avoid the dissemination of gender stereotypes and gender norms, which eventually contribute to amplify the inequities.

- The lecturers’ performances and attitudes are relevant, as they could be role models for their students. For this reason, lecturers need to routinely question their practices: who is asked more, who is allowed to speak for longer (“share of speech”), who is interrupted more frequently when speaking, who receives positive reinforcement when participating, and who is less positively evaluated, among others.

- Usually, during class activities— and especially those that include teamwork or collaborative learning— labour is divided in a manner that reflects gender stereotypes; this becomes clear when we step back to analyze who presents, who writes, and who take care of the "group climate". However, it is important to
recognize and counteract this kind of “easy” task organization, because it does not ensure equal opportunities for development or recognition.

The last area of action refers to the integration of sex and gender perspectives into research and knowledge production, which is one of the six priorities identified by the European Research Area (ERA). This includes the following objectives: 1) to raise awareness on gender segregation in research and on the need to reverse the androcentric biases in science; 2) to use theories (high-, middle-, and low-range) to explain and understand the phenomenon of study under a gender-critical lens; 3) to incorporate and make visible research designs, methodologies, and tools that are gender-sensitive, 4) to carry out research in which sex and gender perspectives are incorporated throughout all the research cycle: research questions, hypotheses, objectives, design, data gathering, analyses, results, dissemination, and research team and leadership; 5) to create and disseminate guidelines for the integration of gender mainstreaming into research (2,11).

**Transversal skills and gender mainstreaming**

Transversal skills are relevant to tackling gender inequities in health and social care through two main pathways: 1) ensuring that the higher education system does not reproduce and spread gender biases and stereotypes during the development of future professionals, and 2) training future professionals to detect and correct biases in daily practice.

The inclusion of transversal skills and related learning outcomes in the curriculum should be done with a gender-sensitive approach. The gender perspective should be embedded in any learning activity that seeks to develop students’ transversal skills. Since communication, interpersonal relationships, critical thinking processes, emotional management, and planning procedures are a social practice, transversal skills are a powerful means to reproduce or disrupt gender norms and stereotypes. It is important to note that, even if we do not consciously incorporate the gender dimension, it will still be also present in some way; indeed, our actions might even reproduce biases and inequities.

**Critical and creative thinking**

Critical and creative thinking are two modes of thinking that are inseparable in everyday reasoning. Whereas creativity entails the process of making or producing, criticality is a process of assessing or judging (15).

Teaching critical and creative thinking with a gender perspective will foster the ability of the students:

- To think deeply about concepts such as patriarchy, sexism, sex–gender system, health determinants and how gender influences them, embodiment, hegemonic masculinity and femininity, gender-based violence, sexual harassment, and other gender-related concepts and theories.

- To routinely question their assumptions and own beliefs related to gender norms and roles, as well as those of others.
• To regularly identify their own gender stereotypes, prejudices, biases, and distortions, as well as those of others.

• To recognize the male-dominant organizational structure and culture of many workplaces.

• To question their own practices with a gender-critical lens, focussing on their own purposes, evidence, conclusions, assumptions, concepts, and points of view. Further, they should also be able to question those of others with the same vigour.

**Interpersonal/socio-emotional and citizen-oriented skills**

Social and emotional skills include a wide range of competencies, such as curiosity, tolerance, sociability, empathy, cooperation, emotional management, assertive communication, and self-control, among others (16).

Teaching social and emotional skills with a gender perspective will foster the ability of the students:

• To identify the implications of language usage in context and recognize how communication can reproduce or disrupt gender norms and stereotypes.

• To have gender-responsible communication in different channels and situations.

• To recognize the relationship between language used and the social representations embedded within some words and expressions that can legitimate and normalize different forms of discrimination.

• To put into play empathy, emotional management, and assertive communication when dealing with a victim of gender-based violence.

**Learning to learn**

Learning to learn is defined as the ability to organize and structure one’s own learning and it involves metacognition about one’s own learning practices.

The incorporation of a gender perspective in the self-reflection and structuration of one's learning process implies questioning if what are we learning has any gendered implications; for instance, whether:

• It reproduces or does not dominate gender norms, roles, or stereotypes.

• It represents an androcentric point of view or is based on unbiased scientific evidence.

• It includes contributions of any relevant author, despite their gender.

• It could be described or justified by any theory or perspective that counteract some androcentric explanation.

In a nutshell, the keystone is learning how to incorporate the gender perspective in one’s own process of learning.
Recommendations on how incorporate gender mainstreaming into the teaching–learning methodologies to develop transversal skills

When planning problem-based learning methodologies with a gender mainstreaming approach, it is important to review the cases or scenarios used to avoid descriptions or characters based on gender stereotypes or patriarchal norms and roles; for example:

- It is crucial to avoid reinforcing the notion that some diseases are single-sex when they actually have similar prevalence—e.g., the patient for a case about acute myocardial infarction is usually a male, although the prevalence in females is nearly the same.

- An effort should be made to avoid reproducing dominant gender norms: many scenarios or cases are designed to have the primary informal caregiver be female, and she is described stereotypically as passive, self-sacrificing, and caring.

- It is important to use the scientific literature to document the differences and similarities between females and males in disease onset, diagnosis, treatment, and prognosis.

- The inclusion of diversity must consider the collective LGTBIQ.

These recommendations are also applicable to simulation scenarios and role-playing games.

When planning a simulation pre-briefing and debriefing, it is also relevant to incorporate the gender perspective into this instructor-guided conversation; for example:

- Since the function of the pre-briefing is to prepare and orient learners to the simulation experience, the introduction of some gender-related subjects or reflections could facilitate their consideration during their performance.

- Since debriefing aims to explore the relationship between actions, thoughts, and emotions, problematizing and discussing gender norms and roles could facilitate their transformation or reframing.

- The simulation actors should be trained to avoid—or at least given guidance about how to avoid—reproducing stereotyped characters.

Along the same vein, the performance during a role-playing game is an opportunity to observe and question how the characters portrayed express beliefs, stereotypes, and gender norms.

Concerning the production of virtual reality videos, the planning and pre-production phases (e.g., scriptwriting, storyboarding, and creating the virtual characters) must be gender-responsible; for example:

- During the definition and portrayal of the characters, avoid reproducing dominant and normative gender identities or caricaturing roles or situations.

- The scriptwriting should be reviewed with a gender-critical lens to identify situations and dialogues that reinforce patriarchal representations of men and women.
A virtual reality video is a privileged scenario to foster the understanding of "the other" and to experience the impact of restrictive gender norms.

Finally, when designing and implementing cooperative learning strategies in the classroom, we need to be aware of and counteract some interactional patterns. For this, the following questions could help to reorient our actions:

- Is there labour division based on gender when students work in groups?
- Who is gaining more public visibility?
- What kind of roles are the students adopting to carry out the tasks? Is there any difference based on gender?
- Is the activity engaging for all the students? Are there differences based on gender?
- How is my performance as a teacher? Is it gender-responsible?

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9. Methods and tools for assessing transversal skills

Mar Carrió

The role of evaluation in the learning process

Assessment is a central element of teaching and the curriculum. It powerfully frames how students learn and what they achieve. It is one of the most significant influences on students' experience of higher education and on everything they get out of it. Therefore, if we want to promote the development of transversal skills, it is very important to highlight the need to assess them and to design quality assessment practices that support their development.

During the learning and teaching process, assessment has three fundamental purposes (1,2):

1) To judge and certify what students have learned. That is, to validate that students have met the course requirements. This is often referred to as summative assessment.

2) Helping students learn to meet course requirements. This often occurs through the use of various feedback processes and is called formative assessment.

3) To develop students' ability to assess their own work beyond the time frame of the course. This involves the progressive development of their own evaluative judgement and is called sustainable assessment.

Although the university has traditionally focused more on the responsibility of certifying the knowledge acquired by students through grades, the use of assessment for learning has a much more significant effect on learners, so in this chapter we will focus mainly on how to use assessment to facilitate the development of transversal skills.

If we want to use assessment to engage students in developing transversal skills, it is necessary that assessment tasks are designed to direct student attention to what needs to be learned and to the activities that best lead to this. Assessment tasks should be significant learning activities in themselves, and not only enable judgements to be made about what has been learned. For this, the feedback received from the assessments has to be used to actively improve student learning. Marks and grades provide little information to students about specific qualities of their work and do not indicate how it might be improved. So, specific and detailed information is needed to show students what has been done well, what has not, and how their work could be better.

For students to become self-directed learners, they need to be supported in the acquisition of the skills they need for learning, including those of assessment. It must be recognised that one of the aims of higher education is the development of students' critical thinking skills, which includes self-criticism, independent judgement and other skills for lifelong learning. Therefore, the responsibility for assessing performance and responding to feedback is a desired outcome of graduates. So, Assessment tasks should therefore help learners to develop
and demonstrate the ability to judge their own performance and that of others and to use feedback.

**Assessment methods and tools for transversal skills**

Assessment is a process that involves 1) collecting data or evidence about students' learning, 2) analysing it to understand their difficulties and 3) providing pedagogical decisions to guide students. The data we can use for the assessment of transversal skills can be very diverse, ranging from students' productions such as written essays, projects, reflective journals, concept or mind maps, videos, posters, etc. to student performances in different situations (real-life or learning activities), such as oral presentations, participation in debates, role-plays, simulations, practicals, internships, etc. These methods of data collection can be summarised in the analysis of documents, productions and/or artifacts, observations or interviews. The first step will therefore be to determine the most appropriate evidence to assess transversal skills. In order to address the diversity of learners, it is recommended to use different types of evidence of assessment so that they can show their learning in different ways.

In order to analyse evidence of learning, different instruments can be used to help teachers define assessment criteria and share them in a clear and transparent way with the students so that they can use them for self and peer-assessment. This requires creating spaces in the classroom to review students' work and performances and discuss them, creating a learning environment in which mistakes, difficulties and obstacles are understood as the starting point for learning. These instruments include rubrics, checklists, scales, lists of criteria, evaluative argumentation, among others.

**Rubrics**

A rubric is a tool, usually presented in the form of a matrix, that describes varying levels of quality, from excellent to poor, for a specific assignment. It is usually used for a relatively complex assignment, such as a project, an essay, an oral presentation or a research paper. Its purposes are to give students informative feedback about their works in progress and to give detailed evaluations of their final products. Although the format of a rubric can vary, all rubrics have two features in common: (1) a list of criteria, or "what counts" in a assignment; and (2) gradations of quality, depending on the relevance, complexity, precision, accuracy, coherence, autonomy, creativity or degree of transferability in the performance of each criteria (Figure 1).
In recent years, the use of rubrics in higher education has increased considerably. They are used to assist teachers in the grading process and provide students with more informative feedback about their strengths and areas in need of improvement, but also have the potential to be useful tools for improving student performance (3). As rubrics clearly present the expected results and how they are to be graded, they can support students’ self-regulation, by promoting reflection, planning assignments, checking progress and reviewing work. It is therefore important to share the rubric with students at the beginning of the learning process and to promote its use to guide the development of the assignments and to recognise where they can make progress in order to improve their level of competence. Therefore, engaging them in the evaluation process, through peer and self-assessment, is a very effective strategy (4,5).

They can also be further involved and create the rubric together with the students (6). This process facilitates a deeper understanding of the intended outcomes and the associated assessment criteria, which is a way not only to enhance their learning, but also to increase students’ capacities to operate as judges of their own learning (7).

Although rubrics offer many advantages in the evaluation process, it should be kept in mind that constructing a good rubric is difficult and time-consuming, so it should be considered what they are most useful for. Hence, it is especially recommended to use them to agree on the assessment criteria among the teaching staff of a School in relation to the competences developed in all courses and areas, such as the transversal skills. There are several examples of well-designed rubrics for transversal skills, such as teamwork, oral communication, written communication, critical and creative thinking, etc (VALUE Rubrics, WEIMPACT-Rubrics, oral communication rubric-CORL, critical thinking).
A new rubric format, known as single-point rubrics, can also be used, which provides students with personalised feedback and aims to focus students not only on their grade, but on constructive feedback.

**Single-point rubrics**

Unlike standard rubrics, the one-point rubric only includes descriptions and indicators of what constitutes successful work; it does not define levels, nor does it define the grade for each level. It includes a space for comments on the strengths of the work done and a space for comments on areas for improvement (Fig. 2) (8). Although it has the disadvantage that it requires more work for teachers to write comments, there are numerous benefits:

1. Provides a space for reflection on the strengths and weaknesses of the students' work. It helps teachers to meaningfully share with students what they have done really well and what they could improve.

2. It does not constrain the work of the students. It does not try to cover all aspects of a project that could go right or wrong, but to give some guidance, which encourages more creativity.

3. It helps take students' attention off the grade and to compare themselves with each other. Each student receives unique feedback that is specific to them and their work, but cannot be easily quantified.

4. Offers more flexibility in grading. Students still receive clear explanations of the grades they have achieved, but there is much more room to consider the student's work holistically.

5. It's simple! The single-point rubric has much less text than other rubric styles. The chances that our students will actually read the whole rubric, reflect on the comments given and remember both are much higher.

<table>
<thead>
<tr>
<th>Concerns</th>
<th>Criteria</th>
<th>Strengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areas for improvement</td>
<td>Standards for this performance</td>
<td>Evidence of exceeding standards</td>
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<td></td>
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<td></td>
<td>Descriptors of achievement</td>
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</tbody>
</table>

**Figure 2.** Basic structure of a single point rubric
Checklists and Scales

Checklists and scales are very useful tools for assessing student performance through observation, as they are specific and easy to use and record what is monitored.

Checklists usually offer a yes/no format in relation to student demonstration of specific criteria. They may be used to record observations of an individual, a group or a whole class.

Scales allow teachers to indicate the degree or frequency of the behaviours, skills and strategies displayed by the learner. Rating scales state the criteria and provide three or four response selections to describe the quality or frequency of student work. Teachers can use rating scales to record observations and students can use them as peer- and self-assessment tools. Teaching students to use descriptive words, such as always, usually, sometimes and never helps them pinpoint specific strengths and needs. Rating scales also give students information for setting goals and improving performance. In a rating scale, the descriptive word is more important than the related number. The more precise and descriptive the words for each scale point, the more reliable the tool. Effective rating scales use descriptors with clearly understood measures, such as frequency. Scales that rely on subjective descriptors of quality, such as fair, good or excellent, are less effective because the single adjective does not contain enough information on what criteria are indicated at each of these points on the scale.

Checklists and scales are very useful for assessing transversal skills, as they are easy and quick to use and this allows data to be recorded at different times and from different people. They are very useful to enable self- and co-assessments. Recently, a mobile app called pentabilities has been developed that allows you to do this. It is a system designed to develop the five major social and emotional skills, called the “Pentabilities”: Responsibility, Cooperation, Autonomy and initiative, Emotional management and Thinking abilities. It offers the possibility to collect data on a scale in real time, analyse it and provide effective feedback to students (Fig. 3).
<table>
<thead>
<tr>
<th>Skills</th>
<th>Indicators</th>
<th>Rate</th>
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<tbody>
<tr>
<td>Responsibility:</td>
<td>Performs assigned tasks, trying to reach commitments</td>
<td>✭✭✭✭</td>
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<tr>
<td></td>
<td>• Works in a consistent manner.</td>
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<td></td>
<td>• Stays connected to the group’s activity.</td>
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<td></td>
<td>• Makes comments or engages in activities related to the task at hand.</td>
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<td></td>
<td>• Performs tasks efficiently.</td>
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<td></td>
<td>• Performs tasks carefully.</td>
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<td></td>
<td>• Perseveres in the face of difficulties.</td>
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<tr>
<td></td>
<td>• Respects the rules.</td>
<td>✭✭✭✭</td>
</tr>
<tr>
<td>Cooperation:</td>
<td>Listens and participates in order to make consensual decisions and resolve conflicts</td>
<td>✭✭✭✭</td>
</tr>
<tr>
<td></td>
<td>• Listens to others.</td>
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<tr>
<td></td>
<td>• Incorporates what others say.</td>
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<td></td>
<td>• Encourages peers’ participation.</td>
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<td></td>
<td>• Engages in group decision-making.</td>
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<td></td>
<td>• Facilitates conflict resolution.</td>
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<td></td>
<td>• Recognizes personal responsibilities and those of others.</td>
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<tr>
<td></td>
<td>• Helps peers selflessly.</td>
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<tr>
<td>Autonomy and initiative:</td>
<td>Works without supervision and asks for help when needed.</td>
<td>✭✭✭✭</td>
</tr>
<tr>
<td></td>
<td>Proposes ideas and solutions to the tasks and needs that arise</td>
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<td></td>
<td>• Brings up ideas.</td>
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<td>• Asks questions when stuck.</td>
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<td></td>
<td>• Plays an active role in group decision-making.</td>
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<td></td>
<td>• Is able to convince others of his/her approaches.</td>
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<td></td>
<td>• Works with determination.</td>
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<tr>
<td></td>
<td>• Believes that he/she can initiate changes.</td>
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</tr>
<tr>
<td>Emotional management:</td>
<td>is aware of his/her emotions and those of others and makes good management</td>
<td>✭✭✭✭</td>
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<tr>
<td></td>
<td>• Transmits cheerfulness.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Remains calm under pressure.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Controls emotions when conflict arises.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Accepts the possibility of making mistakes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Accepts that his/her approaches do not prosper.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Adapts behavior to the circumstances.</td>
<td></td>
</tr>
<tr>
<td>Thinking skills:</td>
<td>refers to the tendency to be interested in intellectual, cultural and/or aesthetic stimuli. From this derives interest in ideas and intellectual exploration, generation of ideas, capacity for reflection</td>
<td>✭✭✭✭</td>
</tr>
<tr>
<td></td>
<td>• Relates new content with previous knowledge.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Makes good reflections on the content.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Makes good reflections on internal personal processes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Asks good questions (to improve understanding or to move forward).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Has creative ideas (explores alternative paths).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Proposes good strategies for problem-solving.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Willing to discover different perspectives.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Expresses ideas effectively (correction, precision, and structure).</td>
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</tr>
</tbody>
</table>

Figure 3. Observable indicators used by the Pentabilities app for the assessment of socio-emotional skills (https://pentabilities.com).
Evaluative argumentation

It is a qualitative evaluation instrument in which the evaluator writes or describes his/her assessment, based on a list of pre-defined criteria. It does not require as much prior work on the design of the instrument as the previous ones. The aim is to provide the learner with clear and constructive feedback. It can also be accompanied by a conversation with the learner.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarity in argumentation</td>
<td></td>
</tr>
<tr>
<td>Coherence within different parts</td>
<td></td>
</tr>
<tr>
<td>Relevance of the conclusions</td>
<td></td>
</tr>
<tr>
<td>Bibliography used</td>
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</tbody>
</table>

**Figure 4.** An example of an evaluative argumentation instrument to assess an essay.

Portfolio, an holistic assessment instrument

The portfolio is an assessment instrument that has proven to be an effective tool for assessing and promoting the development of competences, and it has been extensively used in medical education (9). Portfolios that are used in education contain evidence of how trainees fulfil tasks and how their competence is progressing. So, it is a tool that allows any person to reflect on a given activity in order to improve it and to demonstrate its mastery. The central dynamic of the portfolio is the reflection on the practice carried out with the intention of improving it, with the support of a mentor. Despite variations in content and format, portfolios basically report on work done, feedback received, progress made, and plans for improving competence. Additionally, portfolios may stimulate reflection, because collecting evidence for inclusion in a portfolio requires looking back and analysing what one has accomplished.

Research on what makes a portfolio effective in supporting and assessing competence development shows that robust integration into the curriculum and mentor support are essential. So, it is advisable to consider a portfolio not as a separate instrument but as an activity that can be integrated with other educational activities. On the other hand, without good mentoring, portfolios are not effective and can become a mere bureaucratic hurdle.
Therefore, when implementing it, it should be considered that mentoring requires a significant investment of time and that it can also be complemented by other forms of mentoring, such as peer mentoring. The format of the portfolio has also been found to be important, it should have clear guidelines and well defined goals, but a flexible structure, allowing learners opportunities to personalise it and giving them some freedom to decide on its content (10,11).

Therefore, a good portfolio design should include:

1. Definition of the competences to be assessed.
2. Tools for their development, such as reflective questions, rubrics or competence analysis templates.
3. List of the learning activities where they can develop these competences.
4. Examples of evidence students can provide to show the achievement of competences.

Planning and designing evaluation activities

In order to plan and design formative and empowering assessment tasks, we must start by asking ourselves what students should be able to do; the answer is learning outcomes. That is, to describe precisely what we expect the learner to acquire and know how to do in relation to the transversal skills. If the learning outcomes are described precisely, it will be easy to determine an activity to put them into practice. For their assessment, we must determine what evidence provides us with information on the development of such skills, what techniques we have to collect this evidence (observations, interviews, student productions) and what instruments can help us to analyse them and provide constructive feedback to the students. It will therefore be important to determine at what point in the learning process the assessment task and feedback will be carried out, considering that the more immediate it is, the greater the impact it will have on learning and the more opportunities the student will have to improve. On the other hand, it will be necessary to decide how to involve the learners in the assessment process through self- and co-assessments. Figure 5 shows how to plan a learning and assessment task to develop the competence of critical thinking and creativity.
Evaluating teaching practice

In the same way that assessment of students is key to their learning, it is also crucial for teachers. For this reason, it is highly recommended not only to plan how to assess students but also to plan the assessment of the teaching-learning process carried out. This will allow teachers to learn from teaching practice, reflect on it and continuously improve their teaching.

One of the most widely used models for evaluating educational programmes is the Kirkpatrick model. The model is an established and recognised approach which provides a structure and does not require an excessive amount of time to administer. The characteristics of this model include the simplicity of the process, measurement of a limited number of variables, ease of evaluation criteria, and lack of need to collect the basic data and learners’ previous performance, and independence of individual and environmental variables. It assesses the effectiveness of training programs at four levels: (1) response of the trainee to the training experience (including training experience); (2) the learner’s learning outcomes and increases in knowledge, skill, and attitude towards the attendance experience (how much attendees learned the content after training). This level is usually measured through using a pretest and posttest; (3) the students’ change in behavior and improvement (whether the learning is transferred into practice in the workplace); and (4) results (the ultimate impact of training). Table 1 describes in more detail what is assessed at each level.
### Level Description

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Reaction</td>
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<tr>
<td>2</td>
<td>Learning</td>
</tr>
<tr>
<td>3</td>
<td>Behaviour</td>
</tr>
<tr>
<td>4</td>
<td>Results</td>
</tr>
</tbody>
</table>

### Conclusions

Assessment is a key process in the learning process, and it is what most determines what students learn and how they learn it. If we want to promote students’ autonomy in their future learning, formative, participatory and empowering assessment must be promoted. We must move away from the idea that assessment is only grading and understand it as an integral part of learning, which consists of identifying what has been learned, what has not been learned and what steps need to be taken to achieve the intended objectives. When our aim is to develop transversal skills, it is not enough to plan activities in which they are put into practice, but it is also necessary to provide tools for their evaluation, reflection and improvement. This is what will make it possible to train reflective professionals who are aware of the relevance of these skills and who have the resources to be able to improve and adapt to the different situations that arise.

### References


10. Students’ perception about Transversal Skills in university studies

Mar Carrió & Nathália Rosa

Introduction

The changing environment of today’s societies requires constant transformation and adaptation, and professionals must continue learning to learn skills actively to adapt to changes and complexity. In the current situation, and in the future, the healthcare and social professions face the challenge of acting in complex and unpredictable situations: they are faced with an ever-aging population, epidemiological transitions to chronicity, pandemic outbreaks (such as the currently ongoing Covid-19 pandemic), and increased social inequalities with the associated vulnerabilities, among other issues. These challenges require professionals who can analyze situations using critical and creative thinking, who can make decisions when faced with large amounts of information and that involve the patient/user, and who can manage difficult (and mundane) situations with appropriate interpersonal and emotional skills. To meet these challenges, we must start to improve the training of healthcare and social services professionals in the areas of transversal skills (hereafter, TS) throughout their undergraduate and postgraduate training journeys.

The relevant TS necessary to face changing environments include: i) learning to learn, ii) communication, iii) critical thinking, iv) emotional management, v) interpersonal and citizen-oriented skills, vi) collaborative working, and vii) leadership, among others. Currently, curricula and training programmes for professionals have gaps in their approach to TS: they are excessively centred on the transmission of knowledge per se, rather than on the teaching–learning strategies, which are fragmented and limited to subjects and/or disciplines. This fragmentation is also present in professional practice in the health and social services, where interdisciplinarity and the service-user/patient-centred approaches are not sufficiently implemented in everyday practice.

Along this line, the students’ perceptions of their knowledge about TS, their preferred environment to develop these skills, and their actual experiences should be assessed, as this provides important information for teachers. This can help tutors to continuously reshape the discipline materials and to tailor the components to meet the student needs. If lecturers employ more appropriate training and assessment strategies that are adapted to student needs, it is assumed that students could achieve a higher degree of development in critical thinking, interpersonal skills, and learning to learn.

This chapter focuses on the development of student perception about TS in university studies, their engagement, and preferential teaching-learning approaches specifically related to
critical and creative thinking, interpersonal/socioemotional, citizen-oriented skills, and learning to learn.

Methodology

Qualitative research was used to explore the engagement and preferential teaching-learning approaches on TS; more precisely, seven focus groups were carried out with more than 30 students from different areas of healthcare and social care studies (including medicine, nursing, dental medicine, human biology, social sciences, and social work) who were from Spain, Finland, or Croatia. These focus groups were carried out virtually, with a semi-structured script. The sessions were recorded and transcribed for all groups, and the transcriptions were analyzed for content to identify the main perceptions of the participants about TS (while preserving anonymity and confidentiality). Free, prior, and informed consent was obtained.

This qualitative approach was used to gain an in-depth understanding of social issues based on exploring the opinions, knowledge, perceptions, and concerns of individuals about TS. The focus group discussion aims to obtain data from a purposely selected group of individuals rather than from a statistically representative sample of a broader population.

Results

We present the results based on the three dimensions that guided the focus group with the students: (1) information and previous experience about TS; (2) personal attitude and perception of importance/value, and (3) perception of barriers and facilitators for the implementation of TS in higher education.

Information and previous experience about transversal skills

This dimension explored the level of information and knowledge about the concept of TS, as well the students’ personal experiences with TS in the university. In general, students had difficulties in defining TS. They expressed TS as being related to professional practice: trainable skills strongly influenced by experience, which are indispensable for job performance and crucial for teamwork, independent of professional discipline. They also expressed the acquisition of TS as a continuous, lifelong, uninterrupted learning process in which reflection is fundamental. Individual decisions and actions are taken into consideration based on the consequences that have been experienced.

However, the overall student perception was that there is insufficient TS work in the courses, and that there is a lack of feedback from teachers. The students felt that they have had “brushstrokes” of TS, but that TS are presented only in a few disciplines and without enough depth. They also mentioned a lack of connection between the TS and the teaching–learning process at the university.
In nursing studies, students stated that some training is done at the beginning of the degree (and especially in the first year), which is then integrated into other subjects—but not with sufficient intensity, given the real needs of practice.

Human biology students said that critical and creative thinking is not adequately encouraged, with more value placed on reproducing the theory given in class. According to students, this leads to a loss of critical thinking throughout the degree course. Regarding interpersonal/socioemotional and citizen-oriented skills, students see themselves in a very competitive environment and believe that the university should foster a more collaborative environment and encourage teamwork. On learning to learn, the general student view was that the subjects offered tend to focus on content rather than on competences.

Medical students mentioned that they work on transversal competences in seminars, and specifically with the PBL methodology (problem-based learning); however, they felt that this pedagogical approach is not integrated into other courses.

Social service students specified that critical and creative thinking is strongly developed during studies and assignments, based on an evidence-based approach and on previous studies. On interpersonal/socioemotional and citizen-oriented skills, they cited some disciplines which have adequately involved these skills, but claimed that the Covid-19 pandemic slowed down the development of these competences. On learning to learn, they stated that it has been developed in the courses, albeit without any specific orientation, and they pointed to the more individual perspectives during this process when they stated that enjoying learning helps per se helps to develop this skill.

**Personal attitudes and perceptions about importance/value**

This dimension considered the student’s perception of the usefulness of TS as a health professional or social professional. In general, students affirmed that the three TS are important in professional life, and that their connection and visibility depends on the length of the professional practice. However, the most prominent TS differ according to the characteristics of each professional career.

In human biology, for example, students stated that learning to learn is more important for their professional development, considering that the main future professional careers are related to research and constantly-updated facts. Social service students believed that all skills are important, but they stressed adding the users’ perspective—in other words, that it is important to be critical on behalf of the service users, and not only from their own perspective. Medical students highlighted interpersonal/socioemotional and citizen-oriented skills in the perspective of patient communication and the communication of bad news. They also stated that learning to learn is important for keeping up to date with new developments in the field (research, medicines, innovations, etc.).

Understanding of what it means to be a trained professional in TS also varied from course to course. Social service students felt that the meaning of TS is to be connected to future working life skills, for example, managing the skill to interact effectively but kindly with others. According to the students’ answers, all work-life encounters touch on one of these skills: in service user interface situations, in all decisions that must evaluate different situations, and in working community interactions in which you must regulate yourself or
control someone else’s emotional regulation. Nursing students stated that self-knowledge is the sign that one is trained in TS. For human biology students, the professional who is correctly trained in TS is the one who communicates effectively (scientific field) and horizontally (knowledge sharing). Medical students stated that, apart from the competences related to patient communication, the development of critical thinking is fundamental for a good physician to be able to face situations in his or her professional practice.

However, students, and especially medical students, see themselves as underprepared in TS, especially in learning and critical thinking. They stated that they work a lot on communication with the patient in the degree course, and that is the skill for which they see themselves trained. Nonetheless, they would like to work more on the other skills and feel that the amount of information given in the course does not allow for the development of these competences. The human biology students also did not feel that they had been trained in transversal competences and mentioned the large amount of content and exams that only valued rote memorisation of content but not critical thinking.

Perception of barriers and facilitators for the implementation of transversal skills in higher education

This dimension contemplated the elements that facilitate or hinder the implementation of each TS. In general, students advocate using a higher level of participatory methodologies in all aspects—from classroom methodology to assessments that prioritise differentiated elements. Classroom methodologies imply more contact with real cases, new ways of learning and seeking knowledge, more discussion between teachers and students, and forms of teaching that prioritise the acquisition of knowledge in a more critical way, beyond rote memorisation of a large amount of content. This implies the need for greater proximity of teachers to students, better qualification of teachers in participatory methodologies, and availability of students and teachers to participate in this process.

Students listed different kinds of strategies and assignments which develop TS, including group discussions, collaborative learning, oral exams in groups, self-assessment and peer review after collaborative learning, assignments/essays (with bibliography as well as with one’s own experiences in the field), group discussions based on the work experience, a learning environment that is perceived as safe for practicing TS, analysing cases, using virtual reality, and case simulation.

According to the social service students, studying in groups and discussing together (collaborative learning), with teacher supervision of discussions and reflections, are useful strategies for developing transversal competences.

Nursing students claimed that methods such as simulation and gamification are necessary for effective learning of transversal competences. However, these methods require a qualified teaching staff with clinical experience that is trained in these methodologies. Additionally, new methodologies are needed to effectively transfer the complexity of clinical cases. These methodologies are in stark contrast to traditional lectures and PowerPoint lectures, which are characterised by monotony and simplicity.

The human biology students suggested using more practical cases to deal with the application of theory, as is done in medical studies. They also mentioned having more participatory spaces, in which they can feel comfortable.
The medical students agreed with the need for more participatory methodologies, and that this should be more highly valued in the final mark. They added that more value should be placed on internships, a time during which students can develop many of the TS. However, medical students believe that all these methodologies and tools are good, as long as they promote real student participation.

The barriers perceived by students to the development of TS, in general, focused on the design of the degree curriculum, characterized by having: i) an extensive syllabus that does not provide space to develop competences and skills that go beyond memorisation of content; ii) exams that do not reflect the acquisition of knowledge but rather prioritise the amount of content memorised (e.g., multiple-choice tests); and iii) transmissive teaching methodologies, related not only to the teaching strategies but also to the general approach of the faculty program. The students also noted a lack of feedback when working with TS and a lack of teamwork and multidisciplinary work in which more TS can be developed.

The social service students added that the development of TS can be blocked by having a negative community atmosphere as well as a mindset that is against innovative processes. Medical students also pointed out that the current learning process contradicts their understanding of medicine and their future relationships with patients: while they are being taught to see the disease first and then move to the person, they believe it should be seen first as a person-centred process, starting at the university level.

Overall, students were aware that while it is not an easy task to assess TS (due to its more subjective aspects as compared to grading multiple-choice tests), assessment is necessary, and that assessment methodologies should be changed to have clear guidelines.

Students gave important generalized suggestions for how to improve their studies based on their subject: i) social service students suggested that it would be valuable to incorporate more peer review and to highlight the importance of feedback from service users; ii) nursing students recommended combining different assessment strategies and using appropriate rubrics (including for TS); iii) human biology students proposed adapting the assessment according to the specific TS of each discipline; and iv) medical students suggested that the final course mark should place more emphasis on group work.

**Conclusions**

It is evident from the feedback from the student focus group that the acquisition and development of TS, in addition to the formal, structured knowledge obtainment for each area and discipline, is fundamental during university studies. This transversal knowledge, according to the students’ perceptions, is an important element for training effective professionals.

Higher education is a versatile process that offers students the possibilities to develop their knowledge, abilities, and attitudes so that they can participate actively in wider society, being involved in active citizenship as well as in successful professional careers. The development of TS should be a continuous, participatory, and dialogical process. In this sense, new teaching and learning approaches are needed to address TS; these will require a change in the role of
teachers, from being knowledge transmitters to being learning facilitators, as well as an active attitude on the part of students. TS should also be viewed as assessable learning objectives; for this, it is essential to introduce assessment strategies for these competences into the curricula, with clear and accessible guidelines for students, including student involvement in the assessment process (tools for self-assessment and peer evaluation). If lecturers employ more appropriate training and assessment strategies that are completely adapted to student needs, it is assumed that students could achieve a higher degree of development in critical thinking, interpersonal skills, and learning to learn.

Based on the recognition of the relevance of TS in addressing the challenges of the future, this guide supports opportunities to acquire and develop key competencies, including core competencies, in different educational environments: face-to-face training, simulation, and e-virtual learning. Acquiring such competencies benefits not only future professionals but also patients and clients, as professionals with these skills can offer better healthcare and social care based on a patient/user–centered approach.
11. About the authors

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Graduated in nursing in 2014, she enjoys the science of care in its different areas: assistance, teaching, management, and research. Since graduating, she has been working in the Emergency Department of the Hospital del Mar (Barcelona). Since 2015, she has been teaching at the Escola Superior d’Infermeria del Mar, seeking to teach people through innovative methodologies such as simulation and gamification. She has a Master’s degree in Research and Innovation in Nursing Care and is working on her doctoral thesis in the PhD programme of the Faculty of Medicine of the Autonomous University of Barcelona (UAB).

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A nurse since 2014, she initiated her career in the field of critical patient care with the Master’s Degree in Nursing Interventions for the Critically Ill (University of Barcelona), and since then, she has worked in the Intensive Care Unit of the Hospital del Mar (Barcelona). In 2018, she started in the field of teaching and research at the Escola Superior d’Infermeria del Mar, tutoring clinical practices and being part of the Health Simulation Team. At the same time, she trained in aspects related to nursing management and leadership, with the University Master’s Degree in Leadership and Management of Nursing Services (University of Barcelona) and the Simulation Instructor course: improving teamwork with Teamstepps. In addition to various training courses related to relational styles and interprofessional communication.
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Graduated in Medicine at the Universitat Autònoma de Barcelona (UAB). She trained as a General Surgeon at the teaching Hospital del Mar in Barcelona. During her training, she was involved in the field of clinical nutrition for surgical patients, and she doctored in Medicine and Surgery. In 2000 she started working at the Department of Experimental and Health Sciences, Universitat Pompeu Fabra (UPF) getting involved in teaching Human Nutrition. In January 2007 was promoted to the position of Collaborating PhD Professor of Nutrition at UPF and from 2012 as a responsible teacher of Human Nutrition subjects in Human Biology and Medicine degrees. More recently she has been involved as a responsible teacher in other subjects such as Integrated Medicine and as coordinator of Problem Based Learning methodology and Introduction to Medicine. Dr. Girvent trained as Instructor for Clinical Simulation, an innovative tool for teaching, at Hospital Virtual Valdecilla (Santander, Spain); this allowed her to implement clinical simulation in the Degree of Medicine at the Universitat Pompeu Fabra and currently she’s the Clinical Simulation Coordinator of this degree.

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