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GES App Report O2: Review of existing e-learning materials and online employability skills resources

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Table of Contents

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Executive Summary

1. Introduction

Over the past decades, considerable thinking and policy argumentation has been focused, internationally, on the knowledge, skills and abilities that young people should acquire in order to effectively participate in the workplace and 21st century society. The new globalized and highly competitive environment, broadly described with the term Fourth Industrial Revolution (Schwab, 2017), has obvious implications to both, workplace and education. Many jobs are expected to change due to the impact of digital technologies and automation which will construct a new social, cultural and educational environment.

In this rapidly changing environment it is clearly apparent worldwide that employability and career development have acquired increasing prominence in both national and international policy reports (European Commission, 2014; NACE, 2017; NOC, 2013; OECD, 2013; 2019). Despite that the impact of digital technologies on graduates' future employment opportunities is not yet clear or concrete, it is very likely that new jobs will be created which require new types of employability skills. Academics, educators, policy makers and employers agree that young people need to develop a wide range of higher order skills, which are necessary to find a 'good' job. For example, solving unstructured problems, working with new information-tasks and communicating ideas were steadily increased over the last years.

Employability has become a central concept in the debate concerning the relationship between higher education and the workplace and the role of Higher Education (HE) institutions in relation to graduates' employment (Yorke & Knight, 2006; Hora, Benbow & Smolarek, 2018). For example, in countries like USA, Canada, Australia and European Union as well, policy directions agree that HE institutions should observe their students' employability and provide to them enhanced opportunities to develop their employability skills (AQF, 2019; CTE, 2015; Florida Chamber Foundation, 2019; Lisbon Council, 2007).

Moreover, academic research has been also directed to exploring graduates' employability and creating employability development models for Higher Education (Osmani, et al., 2019; Su & Zhang, 2015; Teng et al., 2019; Williams et al., 2016).

2. Systematic review of resources

The review of existing literature revealed a wide range of overlapping concepts, definitions, taxonomies and frameworks used to describe the various types of employability and non-technical skills necessary to achieve a 'good job'. Those include generic skills, soft skills, key competencies, transferable skills, enterprise skills, and 21st century skills (Artess, Hooley & Mellors-Bourne, 2017; Reid, 2016; Tomlinson & Holmes, 2017).

A preliminary search and scanning of existing review of resources related to the development of graduates' attributes and skills for employability, was initially conducted using Google search engine. Following, a systematic literature review was undertaken using the Scopus, Ebscohost and Scholar Google databases to identify educational models, innovative educational interventions and educational material related to graduates' employability skills.

Employability is traditionally viewed through a range of different angles in relation to the needs of different stakeholders (policy makers, employers, universities, educational and training institutions, students and graduates etc.). There is no single widely-accepted definition of employability skills. This is quite reasonable given the diversity of approaches used by different educators, academics, policy

makers, employers, teaching unions, and higher education institutions. Therefore, we used many search terms i.e., "graduate employability skills", "graduate career skills", "graduate employability development", "higher education and employability skills", "educational models for employability skills", "resources for employability skills", "educational material for employability development", "educational material for career development", "career education", and "career resources".

Literature review suggested a wide range of descriptors of employability skills including workforce skills, learning skills, life skills, interpersonal and social skills, applied and non-cognitive skills, as well as values and attitudes.

3. Theoretical considerations and main ideas

The core notion of employability relates to the degree that graduates have the attributes to obtain (and retain) a fulfilling job (Hillage & Pollard 1998; Harvey 2001). Therefore, employability is considered as a property of the individual student, which is strongly related to learning and, specifically, to learning how to learn. In addition, it is an ongoing developmental process that benefits from students' active reflection. Higher Education institutions is a critical factor that can influence and contribute to graduates' knowledge, skills and experiences (Gioli et al., 2017). However, graduates also draw on social life experiences, including paid and voluntary work.

The definitions of employability can be classified in two main categories: The first is relates to the abilities of students to get, retain and develop their employability skills on a job after graduation (Hillage & Pollard, 1998): *"Employability is about the capability to move self-sufficiently within the labour market to realise potential through sustainable employment. For the individual, employability depends on the knowledge, skills and attitudes they possess, the way they use those assets and present them to employers and the context (e.g. personal circumstances and labour market environment) within which they seek work".* According to Hillage & Pollard (1998), employability incorporates three abilities: a) gaining initial employment, b) maintaining employment and c) obtaining new employment if required.

The second approach, by Yorke & Knight (2006), is considering the curricula adopted by HE programs as a tool for the development of students' employability and employability skills that are suitable for the labour world. According to Yorke & Knight (2006), employability is defined as *"a set of achievements – skills, understandings and personal attributes – that make individuals more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy"* (Yorke & Knight 2006, p. 8). It appears that the second approach could be more realistic and related to the ability of developing a wide range of attributes that can support employment (skills, knowledge, attitudes and personal values). These can be further described and explained by many employability models.

Current educational policy also suggests embedding 21st century core skills into educational systems of all levels (i.e. secondary, vocational, higher education, lifelong development and learning), in order to achieve a quality education that provides young people relevant cognitive, intrapersonal and interpersonal competencies, as well as the ability to apply them in practice a) to succeed in future workplace and b) to effectively participate in society (e.g., European Commission, 2012).

New instructional approaches are also suggested for HE institutions to support teaching and learning of future skills for employability (European Commission, 2014). The key idea is that students' development could be happen through learning environments that enable active collaboration, ongoing discussion, negotiation, problem-solving, active research, practical decision-making and self-

reflection. In this perspective, many institutions adopted information and communication technologies (ICT) and on-line learning platforms to create rich learning experiences as well as to provide guidance to the students towards enhancing their employability skills and abilities.

4. Review of existing frameworks for employability skills

Higher education and training institutions as well as career counselling institutions provide different types of support and, therefore, they use various types of educational material and resources. Given the diverse nature of developing employability skills and offering career support, as well as the theoretical and educational perspectives that appeared in the literature review, we conclude to the importance of defining six broad categories of resources. According to the review, they developed to organise education and training on employability skills, to structure graduate career counselling and, most importantly, to activate young persons in the process of exploring and reflecting on their employability skills.

In conclusion, the resources below have been developed for use in career guidance, counselling and education based on employability frameworks and theories. Therefore, content resources provided by this review report are classified into six major categories, which are expected to address critical employability skills and the main issues to be addressed in an app/educational game about graduates' employability skills, namely:

1. Labour policy documents and material

2. Educational policy and practices for employability

3. Models of integrating employability in HE programs

4. Research and development projects (EU)

5. Educational material for employability skills

6. Existing apps and educational games.

4.1. Labour policies for employability

In the last decade, many policy frameworks have been proposed with regards to employability. Following, we briefly present frameworks form Australia, UK and the USA. Their fundamental dimensions, differences and common sets of skills are important towards connecting higher education and the labour world.

The Australian Core Skills Framework outlines four broad areas skills organised in terms of knowledge, skills and attitudes that might be contained in each area (CSfW, 2013): a) Manage yourself in the world of work, b) Work effectively with others, c) Get the job done and d) Learn and develop.

Similarly, the International Labour Office proposed a framework for core employability skills, organised in four key categories (ILO, 2013): a) learning to learn, b) communication, c) team work, and d) problem-solving. The framework also suggests innovative use of ICT and illustrates various ways of integrating employability skills into core academic content and vocational training.

The British business organisation CBI (2019) suggested three pillars that bridge the various descriptions and frameworks designed to prepare young people for the modern world and getting them 'work ready': a) character, b) knowledge and c) skills. The key employability skills identified are:

listening, debating, presenting ideas, creativity, communication, managing time, prioritising tasks, problem solving, team-working, leadership, planning, reflection, management, and ability to think outside the box.

Relying on data from the Occupational Information Network survey, produced for the US Department of Labor (O*NET, 2017), Bakhshi et al. (2017) identified the 10 most important employability skills and abilities for the UK as following: a) Judgment and Decision Making, b) Fluency of Ideas, c) Active Learning, d) Learning Strategies, e) Originality, f) Systems Evaluation, g) Deductive Reasoning, h) Complex Problem Solving, i) Systems Analysis and g) Monitoring.

4.2. Educational policy and practices for employability

With regards to educational policy and employability skills development, our review identified a range of different models. Those models are varying in terms of the fundamental factors and the perspective of developing employability and career skills they propose.

The Common Framework for Employability Skills (CTE, 2015) was developed by the U.S. Department of Education as part of an initiative of the Office of Career, Technical, and Adult Education, workforce development and business organizations. It identifies three pillars: a) *applied knowledge*, b) *effective relationships*, and c) *workplace skills* with specific categories of skills which could leverage and connect the efforts of policy makers, educators and employers. The framework advances a unifying set of skills that cuts across the workforce development and education sectors based on an inventory of existing employability skills standards and assessments.

The Skills and Competencies Taxonomy was developed by the Canadian National Occupational Classification (NOC, 2013)**.** The taxonomy is composed of seven main categories: skills, personal abilities and attributes, knowledge, interests, work context, work activities, tools and technology. In addition, it provides hundreds of occupational descriptors used in the labour market to describe job requirements and individuals' personal characteristics.

The Higher Education Academy Framework in the USA described a range of key aspects of employability organised into the following categories (Cole & Tibby, 2013; Artess, Hooley & Mellors-Bourne, 2017):

- attributes and capabilities
- specialist technical and transferable skills
- knowledge and application
- behaviours, qualities and values
- self, social and cultural awareness
- confidence, resilience and adaptability
- experience and networks
- enterprise and entrepreneurship
- internationalisation
- reflection and articulation
- career guidance and management.

Another interesting classification is related to the *21st century skills* movement (ATC21S, 2103; P21, 2013; Lisbon Council, 2007). Policy and researchers suggested that 21st century skills can be grouped into five broad categories: a) *ways of thinking* (creativity and innovation, critical thinking, problem

solving, decision making, learning to learn, metacognition); b) *ways of working* (communication, collaboration); c) *tools for working* (information literacy, media literacy); d) *digital skills* (ICT operations and concepts, computational thinking), and e) *skills for living in the world* (citizenship, life and career, initiative, flexibility, leadership, adaptability, self-direction, personal and social responsibility).

Recently, the Australian Qualifications Framework specified key descriptors for employability in three separate domains which suggests not to be considered in isolation from each other (AQF, 2019): a) *Knowledge,* i.e. field specific information and ideas needed to inform action), b) *Skills*, i.e. the abilities required to take action, acquired through deliberate, systematic, and sustained effort), and c) *Application*, i.e. taking action within the context of learning and assessment).

4.3. Development models for graduates' employability

As far as higher education it concerns, literature suggested a wide range of practices and approaches to include employability in the programs offered by the universities around the globe (European Commission, 2014; Hora, Benbow & Smolarek, 2018; Huang & Turner, 2018; Tomlinson & Holmes, 2017). For example, embedding employability in the curriculum; providing extra-curricular opportunities for students to enhance their employability; building links with the labour market; providing students with actual experiences of the labour market; using institutional career guidance services; encouraging students' reflection on their skills and increasing their capacity to articulate and communicate their learning to employers; encouraging student mobility and fostering a global perspective etc. (Artess, Hooley & Mellors-Bourne, 2017).

Our review identified a number of different employability models for HE institutions with regards to delivering career development learning to their students. Those models are varying in terms of the constitutional factors and the approach used for employability development. In the context of Higher Education, career development learning has been described as a process of "… *helping students to acquire knowledge, concepts, skills and attitudes which will equip them to manage their careers, i.e. their lifelong progression in learning and in work.*" (Watts 2006, p. 2)

The first reported model for graduates' employability development proposed by Harvey, Locke & Morey (2002). The key notion is that development of employability concerns *how individuals engage with opportunities, and reflect and articulate their skills and experiences*. Therefore, employability is linking internal and external factors (i.e. all the opportunities offered by higher education and the labour market) such as extracurricular experiences that can foster the acquisition of employability attributes. In addition, the model identifies four core processes that determine employability: a) *suitable pedagogy* that encourages development, b) *students' engagement*, c) *students' self-reflection*, and d) a*rticulation of experiences and abilities*. The skills considered most important in the model are: self-promotional skills, the willingness to develop employability attributes, and the ability to reflect on them.

Based on empirical data, Knight and Yorke (2004) developed the *USEM model* which provides a commonly shared taxonomy towards offering students opportunities to develop self-reflectiveness and self-consciousness regarding their personal and professional identity. The USEM model became a widely accepted model which considers employability as the result of the interaction of four broad and inter-related components: a) *subject understanding* (knowledge and consciousness of future work), b) *skillful practice* (generic and specific skills necessary for their future work), c) *efficacy beliefs*

(students' self-theories and personal qualities to read the contexts of life, situations and events), and d) *metacognition* (student's critical sense and self-awareness regarding their learning, reflection in, on and for practice, capacity for self-regulation). In addition, Yorke & Knight (2006, p. 38) stressed the significance of embedding employability through the entire curriculum in higher education institutions. This is an ambitious strategy aiming at the integration of a set of 'transferable' skills and competencies, in the programs offered, through co- and extra-curricular activities.

The *DOTS model* was evolving as a theoretical model and a consequence of the practical solutions provided by the Centre for Employability, at the University of Central Lancashire in the UK, towards enhancing the career prospects of students and graduates (Watts, 2006). The framework states that four components are fundamental for careers education and designing students' experiences to facilitate the development: a) *D*ecision-making skills: students need to be able to weigh up personal factors to make a sound career plan, b) *O*pportunity awareness: students' knowledge of work opportunities and their requirements, ability to research these opportunities, c) *T*ransition learning: students' preparation to understand of how to seek and secure opportunities, job searching and self-presenting skills and d) *S*elf-awareness: students' ability to identify and articulate motivations, skills, interests, abilities, values and personality as they affect career plans. The value of DOTS model lies in its simplicity, since it allows individuals to organise the complexity of career development learning into a manageable framework. To be effective, these elements need to be dynamically articulated. In other words, an individual will need to relate his understanding of himself to the opportunities available before arriving at and attempting to implement a career decision. Graduates may go through many iterations of this cyclical pattern, during their lifetime, as they progressively revise their career plans.

Based on existing research into employability issues, Dacre Pool & Sewell (2007) developed the *CareerEDGE model* as a practical model clarifying many aspects of the graduate employability concept. The key components of the CareerEDGE model highlight the most important aspects of employability, i.e., a) career development learning, b) experience (work and life), c) degree subject knowledge, skills and understanding, d) generic skills and e) emotional intelligence. In a revised version of the model, Dacre Pool (2017) advocated the key role of *emotional intelligence* as a critical component for graduate employability development. The CareerEDGE model can also be used as a working framework in order to explain the concept of employability to the students and to enable them to take responsibility for their own employability. It can also serve as a practical framework to helpful to planning educational programs and structured interventions in HE with the objective of supporting students to develop employability skills.

4.4. Research and development projects for employability

Over the last decade a wide range of R&D projects were supported by EU initiatives and implemented in various countries in Europe. Table 1 presents a brief outline of those projects and their key aspects in relation to employability of young people. The websites of those projects provide, among others, innovative methodologies and tools, curriculum design, educational material, virtual platforms and digital tools, assessment tools, e-counselling and mentoring programs about employability skills etc.

Table 1. EU projects for graduates' employability

Project	Main outcomes
Skill Up (Erasmus+ project) http://skill-up-project.eu An Erasmus+ project aiming to create real, practical, scalable ways to enhance new graduates' employability skills by improving the connection between HE curricula and the demands of the labour world.	The project implemented a virtual platform that acted as a hub for attracting stakeholders offering guidance to labour market newcomers and real hands-on experiences in professional world as part of students learning. It provided a MOOC in order to enhance access to career counselling and guidance services for undergraduates by training tutors in Career Counselling with emphasis in e-Counselling. It also provided a series of authentic learning scenarios have been designed and created in different academic programmes prioritized by the partners' institutions.
GetThere (Erasmus+ programme) https://getthereprojecteu.wordpress.com This project used an innovative curriculum model and a new learning methodology with the aim to offer an effective programme for addressing the issue of youth unemployment in order to develop better employability skills and move into employment.	The project provided on two innovative methodologies and tools: • Employability Skills Support Book (ES) – an innovative curriculum focused on developing employability skills from ASDAN, a UK Awarding Body. • Mentoring Programme (MP) from European Youth (Diagrama) based in the UK.
EMPLOY (Erasmus+ programme) https://employ.dsw.edu.pl EMPLOY promoted the enhancement of the employability of students in higher education from a non-traditional background (both younger and adult) through improving the efficiency of transitions into the graduate labour market.	The project delivered four important handbooks and leaflets: • The student handbook brings together best practice, guidance and policy. • The Employer and Higher Education Staff Handbook that aim to make them aware of the needs of non-traditional students in relation to employability. • Higher Education Staff policy issues leaflet. • Graduate employer policy issues leaflet.
EU Youth: From theory to action (Erasmus+ project) www.actyouth.eu The main aim of the project was to foster the employability and innovative potential of young people/students & graduates by upgrading and developing their competencies for entrepreneurship, entrepreneurial attitudes and other transversal competencies necessary for successful entering the labour market.	The project delivered an ICT tool for competence assessment, a simulation game, training packages per competence (for student/graduate and for trainer/lecturer). All products were translated in the national partners' languages plus English.

Innovative Entrepreneurship for Increased Employability, New Business Creation and Economic Growth (Erasmus+ project)

http://innogrow.org

The INNOGROW project is designed for increasing employability levels of and new business creation by young unemployed individuals (including NEETs) and higher education students.

The project focused on use of an innovative 'learning path' method which includes a) entrepreneurship skills and a competency profile of an innovative entrepreneur, b) a self-assessment tool on innovative entrepreneurship, c) innovative entrepreneurship learning material and d) a web-based mobile software for assessment, training and business idea development.

4.5. Educational material for employability skills

In this section we classified a range of existing web-based resources and e-learning material reported by universities, research institutions, educational or training institutions and employment organisations. We did not manage to locate any material for employability offered by labour market and policy organisations.

In addition, websites of career development organisations that deliver educational programs and provide career development counselling were identified. MOOC providers were also located (e.g. EdX, Coursera, Linkedin Learning) and courses they offer in relation to employability skills and career development were also considered.

Those organisations offer a range of resources, educational and training programs, as well as online tools that help students to identify and evaluate their employability skills. They also contain reviews of resources, especially assessment instruments (e.g. interest inventories, value surveys, measure of skills' self-efficacy etc.) and information systems. All those resources were also used to get an overview of course units and educational material used with regards to the development of employability skills.

Those sources presented in Table 2 constitute an overview of employability frameworks, models, educational interventions and approaches developed in various countries around the globe. They provide guidelines for employability in HE curriculum, pedagogy of employability and educational material, primarily intended for staff in HE institutions who are interested about enhancing their students' employability.

Table 2. Web-based resources for employability skills

Resource	Useful material for the project
CEDEFOP Developing employability skills https://www.cedefop.europa.eu/en/toolkits/vet-toolkit-tackling-early-leaving/intervention-approaches/developing-employability-skills Cedefop launched the VET toolkit for tackling early leaving from education and training in May 2017. An updated edition of 2019 is also available.	It provides a wide range of training material (good practices, toolkits and tools for policy, updated statistical data, relevant publications and further resources etc.) • to help practitioners and policy-makers with practical support regarding transition from education to employment • to help young people develop the types of behaviours, attitudes and skills that employers and the labour market require

Developing EmployABILITY Curtin University Australlia https://developingemployability.edu.au The Developing EmployABILITY Initiative is a collaboration involving over 30 higher education institutions and over 700 scholars internationally. The tool and resources can be uploaded to a learning management system (LMS) or downloaded for printing.	This is actually web hub that contains a large number of resources and educational material addressed to academics and students. Students begin by creating a personalized employability profile report using an online self-assessment tool. An online profile tool utilizes all these resources in multiple ways: • Self-reading • Integration into assessment tasks • Integration into class activities • Career-related workshops preparation
Impetus https://impetus.org.uk Equip service providers, employers, funders and policymakers with the information they need to inform their service design and investment decisions to improve the employability of young people, including young people from disadvantaged backgrounds.	Impetus foundation conducts research covers issues such as GCSE results, university access and youth unemployment. On the webpage are listed reports and policy briefings about employability of young people.
UK Government's Department for International Development https://assets.publishing.service.gov.uk/media/5d71187ce5274a097c07b985/21st_century.pdf	This report highlights research and emerging evidence to help inform countries for 21st Century skills, at the global level. The purpose of this study is to provide a summary of the evidence related to issues associated with the definition, demand and delivery of 21st Century Skills.
Worldskills UK https://www.worldskillsuk.org/directions/careers-advice-resources/careers-advice-toolkit WorldSkills UK is an independent charity and a partnership between employers, education and governments. It organizes UK and international skills competitions.	The website delivers a digital careers advice toolkit, free to download and aimed at schools and colleges. I provides a guide to supporting young people with employability skills and careers information. The website contains career curriculums with video's, quizzes and engaging activities to support the learner along their career journey.
ASDAN https://www.asdan.org.uk/training/employability Developed as part of an ERASMUS+ project, this resource is an employability skills handbook for employers and educators. Based on materials including ASDAN's Employability Skills Development course, it provides tutors with methods, tools and skills to help young people gain work.	This Employability qualification provides a framework for developing and recognising general employability skills. It is primarily intended for young people and adults who are not yet ready for employment but for whom getting a job is a reasonable aim within a matter of months. The activities in the handbook have been designed to meet the needs of different learners, support personalised learning, and raise learners' awareness of self and others through reflective. It covers a wide range of skills including teamwork, communication, self-management, problem solving, customer awareness.
JISC Developing student employability https://www.jisc.ac.uk/rd/projects/developing-student-employability#	This project webpage contains quick guides to e-portfolios and enhancing student employability through technology, including supporting assessment and feedback. Also includes

A Project exploring the employability opportunities offered by institutions, and the role of technology in maximising the effectiveness of those opportunities, including examples of best practice.	case studies and toolkit for usable guidance to aid planning for developing student employability.
Prospects career advice https://www.prospects.ac.uk Guidance to students and graduates about career and study opportunities.	Online resource portal that outlines employability skills and links them to jobs, aimed at people applying to university through to graduate level job candidates. Includes planning tools and templates for CVs, search engine etc. Outlines six key skills: Resilience, Good communication, Effective leadership and management, Planning and research skills, Self-management, Teamwork & interpersonal skills.
EmployAbility https://www.employ-ability.org.uk A not profit organisation operates as a hub connecting employers, professionals, students and universities.	Resources for disabled students are provided to give them the skills and support to apply for jobs, gain access to the latest internship or graduate program opportunities with disability inclusive employers.
Developing Learners' Employability Skills https://dera.ioe.ac.uk/1036/7/employability-guide_Redacted.pdf A guide for integrating employability skills to teaching.	The guide represents the professional standards for teachers, tutors and trainers in the lifelong learning sector.
Department of Workforce Development https://dpi.wi.gov/sites/default/files/imce/cte/pdf/ylimplementation.pdf The Wisconsin Youth Leadership Certificate offered by the Department of Public Instruction (DPI) is to recognize a student's mastery and exhibition of leadership skills valued by employers, communities, and organizations.	The certificate includes curriculum and educational material. It certificate allows: Students to document their leadership skills and service hours, Employers and community organizations to assess the skills necessary for success, Educators to customize instruction and experiences to help learners to acquire valuable leadership skills and also 21st Century skills in Leadership Skills and Attitudes.
New Vision for Education: Fostering Social and Emotional Learning Through Technology https://blogs.uis.edu/colrs/category/employability/teaching-strategies-for-employability-skills Center for Online Learning, Research and Service of Illinois Springfield	This blog contains a large amount of information, educational material and content about employability skills, in terms of both university and labor perspective. It also presents best practices and news from this area of interest.
The College Carrere Readiness and Success Center (USA) https://ccrscenter.org The College Carrere Readiness and Success Center provides technical assistance to regional centers and state education agencies	This Employability Skills Framework provides tools and strategies to prioritize employability skills at the state, employer, district, and individual teacher levels. It provides a self-assessment tool, designed to help educators reflect on the extent to which they are already embedding employability skills into instruction.

	It guides users through key decision points for developing several different types of measures, including: portfolios, rubrics, employer feedback and evaluation, and student self-assessments.
Imperial Award https://www.imperial.ac.uk/students/imperial-award/?fbclid=IwAR1S_JKsG-seQHGZ6Hzxl0Ali3rDVy5jlPfTKbmDTaDqlpdts-X0X_50Y1w	Online support tools available for all students attending Imperial College London, encouraging them to engage in self-reflection and personal development, and recognising this on their College transcript. Students engage with a program to develop and reflect on their employability skills.
Barclays life skills https://barclayslifeskills.com/educators/lessons Provides supporting material and lesson plans for educations and students	This portal contains several free lesson plans and resources. Each lesson includes a simple plan and presentation slides that can be adapted to suit most learning environments.
Skills Development Scotland (SDS) https://www.skillsdevelopmentscotland.co.uk Skills Development Scotland (SDS) is Scotland's national skills body. It contributes to Scotland's sustainable economic growth by supporting people and businesses to develop and apply their skills. It provides services that deliver the very best outcomes for Scotland's people, businesses and the economy.	Government site contains frameworks, policies and case studies about basic employment skills.
Princes Trust https://www.princes-trust.org.uk/help-for-young-people/programmes	This organisation offers a variety of online programs and resources to boost the employability of young people (up to the age of 30). Contains a wide selection of lessons that can be easily accessed and downloaded for use with a class or group of students. Topics include technology, financial literacy and wellbeing.
PWC toolkit https://www.pwc.co.uk/who-we-are/our-purpose/empowered-people-communities/social-mobility/employability-skills-toolkit.html	Contains lesson plans including employability skills. All the lesson plans and facilitator guides are designed to be as simple to follow as they can be, so that they can be picked up and delivered with minimal preparation. As such, the resources are suitable to be used at home.
IBM Skills Academy https://www-03.ibm.com/services/weblectures/dlv/Gate.wss?handler=Login&action=index&customer=meap&offering=meai	A training and certification program designed to bridge the skills gap between the university and the market industry. Designed to teach students skills which will give them an advantage in the job market. Offers 'career path' based on job-based training (e.g., big data engineer, AI analyst), 'blended learning' which mixes offline and classroom work, and an 'open badge' which allows individuals to pass exams and get badges to prove they have acquired a skill.

Empass
https://empass.mobi/aboutus

Skills development platform with some free and some pay-to-use content, focused on programming skills.

A mobile platform with high quality assessments and course content that ensure its users learn and continuously improvement without having to alter their working schedule.

DG Employment TAP Scotland
https://www.dgtap.co.uk/work-based-learning

DGTAP are working with a wide range of local businesses which is helping to maximise the number of opportunities available within the region, by engaging with employers and directing those seeking employment.

The portal site provides useful material for the development of links in subjects like: building CV, Job Search and Interview.

4.6. Apps and online games for employability

Finally to serve the purpose of this review, we report a sixth category of resources that contain some kind of gaming element in digital and Web-based applications for employability. During the last decade, the expanded possibilities and the role of Web-based apps, social media and educational games have been recognised for employability and career development interventions (Pordelan & Hosseinian 2020; Sampson & Osborne, 2015). Most of these systems also contain assessment instruments, instructional material (e.g. CV writing, job interviews) and options for interacting and receiving counselling.

Table 3 presents a brief outline of existing on-line games and applications and their key aspects in relation to employability of young people.

Table 3. Online games and applications for employability skills

Source and content	Useful material can be utilized by the project
Futureworx (ESAT) https://futureworx.ca	Futureworx provides a range of employment, educational, and training programs, as well as, business, corporate and customized services.
Futureworx is a non-profit organization in Canada with a mission to help people with diverse needs identify their strengths and goals, develop skills and achieve success in school, work, and life.	In addition, Futureworx offers the Employability Skills Assessment Tool tool for assessing, tracking and supporting the development of employability skills, i.e. motivation, attitude, accountability, time management, stress management, presentation, teamwork, adaptability, confidence.
Totem learning https://www.totemlearning.com This platform provides three games designed to encourage players develop project management,	**Totem games** **Project Manager** is a single-player scenario-based gaming aiming at the development of project management skills

business and soft skills. Additional material for teachers helpful to guide students on any area they struggle are also provided.	**The Business Game** is an online, business simulation game; the player is addressed to play the role of an entrepreneur starting up a business. **Microlaunch Online** is a single-player game. The participants are expected to construct a sequence of six research projects, generating insights to build a new brand from concept to launch while keeping within a budget and being up against the clock
Lesley Strachan (2016) Teaching employability skills through simulation games Paper published in *the Journal of Pedagogic Development*, 6(2)	This paper examines the use of a business simulation game to test its effectiveness in promoting the awareness of employability skills in undergraduate students.
Inkpath https://www.inkpath.co.uk Inkpath is a training management system app is designed to be used by an institution (e.g. a university) to engage students and allow them to build their skills based on a career trajectory. The system includes also e-portfolio features.	The app encompasses tools that enable users to analyse their strengths and weaknesses and formulate a plan to improve them. The skills acquired by students are mapped onto the university's skills framework. In addition, students can record and export their skills and experiences, and locate local available opportunities for development.
VirtualSpeech virtualspeech.com VirtualSpeech is a virtual reality (VR) app designed to give employees or students a chance to practice and improve business skills in realistic VR scenarios. The VR tap works as a standalone training tool but it can be a part of online courses or integrated into learning management systems.	The platform provides VR scenarios and e-learning material (i.e. educational scenarios, videos, tests, Syllabus etc.) The content of e-learning courses and material are mostly focused on communication skills, including public speaking, presentation skills, media training and leadership communication.
Career professor works https://careerprofessor.works/supporting-student-employability-c-19-times Careerprofessor is an employability app that supports students to develop the intercultural skills employers will place even greater value on in a post-pandemic era. This app is designed as a digital employability coach and provides a platform for students to grow skills and knowledge that will enhance their appeal in an increasingly competitive and complex global job market.	Adopting a fun gaming approach, Careerprofessor trains students through a series of global and market-specific questions on **social interaction**, doing business and job hunting. The platform is also providing e-learning material and labor driven material, educational scenarios, educational videos and online tests.
Classroom Aid https://classroom-aid.com/2012/11/09/15-business-simulation-games-could-build-hands-on-business-experience	This site provides links to more than 15 Business Simulation Games

It is most important for the purpose of the game development to focus on existing games and gamified applications classified in the last category. However, those resources were scarce. Interestingly we discovered that few existing games apart from one or two were specifically designed to support graduates in career related issues. It is also a case for concern as Sampson and Osborne (2015) pointed out that the games are rarely designed by career experts or tested out scientifically. However, there are games that may have features that help young people develop in relation to their employability.

5. Summary and conclusion

The space of employability education and careers support is actually complex and dynamic. It did not come as a surprise that we did not manage to find any existing comprehensive review of career development and employability resources. However we did locate on-line resources of policy and educational frameworks, practices and tools, educational material and digital which helped us come up with six categories of career development, choice and employability resources.

Employability appeared as a set of achievements (knowledge, skills, attitudes, understandings, personal values or attributes, etc.) that make graduates more likely to gain employment. A list of skills will not be sufficient to achieve the diverse range of student abilities that higher education need to respond upon effectively. Importantly, providing students with the opportunities to gain the necessary skills, knowledge, understanding and personal attributes through employability related activities is obviously of great value. However, providing to the students enhanced opportunities to reflect on these activities and evaluate their skills it is likely that a gaming experience will transfer into learning.

The present review database is expected to offer to the GES App/game design a rich body of content ideas and approaches towards developing an application suitable for students and graduates who are interested to explore and reflect on their skills with the aim to better address their careers. Based on existing theoretical models and the systematic literature review, a conceptual framework for the design of an application about employability skills should incorporate four pillars, as well as the consequent possible skills within each dimension:

- **Applied knowledge and skills:** creative thinking, critical thinking, knowledge in context, professional knowledge, problem solving, research skills, analytical thinking skills, divergent thinking, computational thinking, and scientific thinking.
- **Workforce and learning skills:** autonomy, career management, decision making, digital literacy skills, enterprise and entrepreneurship, independent thinking, language skills, second language skills, leadership, multi-tasking, networking skills, opportunity awareness, positive attitude, responsibility, willingness and capability to learn, writing skills.
- **Interpersonal and social skills:** communication skills, connectivity skills, emotional intelligence, feedback (giving and receiving), listening/understanding others' ideas, presentation skills, social intelligence, systemic thinking, team-working.
- **Personal skills, values and attitudes:** empathy, ethics, work ethics, flexibility and adaptability, self-direction, self-management, self-regulation, time management, work independently.

The content resources described in this review report are helpful in designing and evaluating an application with game features about graduates' employability skills. The proposed classification of the employability skills, that will be possibly included in the game content and the gaming scenarios, is expected to reflect a balance between academic, non-technical and applied knowledge as well as workforce skills, values and attitudes that students require to effectively participate in the workforce

of the digital society. Many of the skills above are overlapping and could belong to more than one dimensions.

In conclusion, those resources could contribute in the design of suitable gaming activities that engage students and promote their reflection. Gamifying exploration may therefore be especially important. For example, exploration of educational and occupational opportunities are extremely important but young people are often not motivated to do this. In addition, scenarios of counselling interviews with experts and carrier counsellors, valuable occupational resources, debate scenarios with peers, self-evaluation and skills easement tools etc. may be useful to incorporate in this game.

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