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Opening the Black-Box in Lifelong E-Learning for Employability: A Framework for a Socio-Technical E-Learning Employability System of Measurement (STELEM)

Juan-Francisco Martínez-Cerdá ¹, Joan Torrent-Sellens ² , Inés González-González ^{3,*} and Pilar Ficapal-Cusí ²

¹ Faculty of Psychology and Education Sciences, Universitat Oberta de Catalunya, 08035 Barcelona, Spain; jmartinezcer@uoc.edu

² Faculty of Economics and Business Studies, Universitat Oberta de Catalunya, 08035 Barcelona, Spain; jtorrent@uoc.edu (J.T.-S.); pficapal@uoc.edu (P.F.-C.)

³ Faculty of Business and Communication, Universidad Internacional de La Rioja, 26006 Logroño, Spain

* Correspondence: ines.gonzalez@unir.net; Tel.: +34-941-210-211

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Abstract: Human beings must develop many skills to cope with the large amount of challenges that currently exist in the world: media empowerment for an active and democratic citizenship, knowledge acquisition and conversion for lifelong and life-wide learning, 21st century skills for matching demand and supply in labor markets, and dispositional employability for unpredictable future career success. One of the tools for achieving these is online education, in which students have the chance to manage their own time, content, and goals. Thus, this paper analyzes these issues from the perspective of skills gained through e-learning and validates the Socio-Technical E-learning Employability System of Measurement (STELEM) framework. The research was carried out with former students of the Universitat Oberta de Catalunya. Exploratory and confirmatory factorial analyses validate several consistent and reliable scales in two areas: (i) employability, based on educational social capital, media empowerment, knowledge acquisition, knowledge conversion, literacy, digitalness, collaboration, resilience, proactivity, identity, openness, motivation, organizational culture, and employment security; and (ii) socio-technical systems existing in this open online university, based on its information and communications technology (ICT), learning tasks, as well as student-centered and organizational approaches. The research provides two new psychometrical scales that are useful for the evaluation, monitoring, and assessment of relationships and influences between socio-technical e-learning organizations and employability skills development, and proposes a set of indicators related to human and social capital, valid in employability contexts.

Keywords: employability; skills; e-learning; socio-technical system; lifelong learning

1. Introduction

Our society is experiencing a time of great social, economic, political, technological, and educational changes. At the social level, more than 65 million people are forcibly displaced, in a humanitarian crisis comparable the one that existed after World War II [1]. At the economic level, a collaborative economy is being generated, one that is motivated by price, convenience, and non-monetary exchanges [2]. In the political dimension, different actors are generating a post-truth politics [3] with consequences in different areas, one of them being education [4]. Specifically,

the educational sphere is also being modified due to the pedagogical use of information and communication technologies [5].

From this educational perspective, all these changes are also affecting the relationship between education and employability, a subject of great concern in many countries and international organizations. In fact, the vast majority of countries have been applying lifelong learning initiatives that have been based and have been very close to the human capital theory [6,7], itself based on the importance of skills and abilities learned by citizens as avenues for the economic and social development of countries. In this way, many criticisms are being put on the table, one being that its conceptualization is too utopian [8]; other examples of criticisms involve its economic orientation and mercantilist vision of education [9].

Thus, the application of the human capital theory has generated confusing situations, such as overqualification [10], skill-biased technical change that increases the level of employment of the most educated workers [11], or a lack of concreteness and utility for numerous situations revolving around career and working life pathways [12]. On the other hand, this generally and economically-centered accepted human capital theory has been aimed at the individualization of work organizations, a situation that in the present times of Uberisation can have different consequences that are not always good for workers, such as involuntary self-employment, job insecurity, and personal debt [13].

This context of a networked society with an economy based on social and peer production [14] has an impact in several areas, such as the critique of the individualist and economic vision of human and social capital [15], and an adult learning affected by globalization, which has made learning become more work oriented [16]. In this sense, education has to be redesigned to take into account more imaginative and artistic aspects, which help to understand the large number of changes we are experiencing today [17]. In addition, education has to contribute to the development of lifelong learning because of its current focus on economic issues, such as employability, especially in Europe [18].

Considering all these aspects, our paper aims to open a new way of analyzing and measuring the relationship between lifelong e-learning and employability by proposing a framework for a Socio-Technical E-learning Employability System of Measurement (STELEM). This framework takes into account a number of issues linked to employability, which are related to biographical, psychological, cognitive, pedagogical, educational, social, technological, business, and political aspects. All these variables are necessary and important for establishing mechanisms for measuring an online education that must develop the skills for work, but above all for life. It is worth noting that this kind of education is related to the ancient Greek term of *paideia*, which has to do with education that shapes an ideal and excellent citizen of the polis [19,20].

2. Theoretical Context and Hypotheses

At the theoretical level, the research developed has connections with various theories. On the one hand, it connects with aspects related to the theory of discrimination, which asserts that several personal characteristics are valued in the labor market [21]. There is another relationship with labor markets and the queue theory [22], which states that workers are ranked according to their productivity and wages.

On the other hand, the paper is mainly related to the human capital theory, briefly discussed above. This theory has been used to guide continuing education, which has been focused on improving workforce employability under the OECD's guidelines and point of view for human capital [23]. In fact, it seems that lifelong learning, which emerged by the mid-1990s, was very aligned with the Organization for Economic and Development (OECD), the EU, and the World Bank's approaches, which put an emphasis on work, and that it forgot its other main approach according to the UNESCO's humanistic orientation [24].

From an educational point of view, a framework based on online learning is presented because this type of methodology can act as a catalyst for refocusing the educational world [25]. Thus, the world of e-learning needs a new theory about learning [26], which has to overcome the different generations of

e-learning technologies for teacher-student-content management [27] by going toward a smart learning realized through e-learning [28].

Based on these premises, the framework starts from the idea of considering the online education system in a holistic way, according to the propositions of a whole that goes beyond the sum of its parts [29]. From this perspective, and considering that the competences developed through e-learning have to be valid for the improvement of employability, the approach of socio-technical systems has been considered. This theory enables the analysis of relations between the different and complementary social and technological actors that intervene in a coordinated and interrelated way in the world of work, with many uses and applications [30]. This theory allows the use of diverse socio-technical design principles that are associated with the improvement and efficiency of the relations between social and technical systems [31].

Considering the current and future development of information and communication technologies (ICT), and their application in educational contexts with ubiquitous e-learners, the socio-technical perspective is open to new concepts, such as the ecology of the e-learning environment [32]. In this way, the framework is based on a valid approach in the future. By taking into account student-related issues, this student-centered framework is very useful for measuring important points related to work motivation, performance, and skills development, such as achievement and motivation control, anxiety and emotion control, and self-regulation [33].

With respect to the validity and use of socio-technical systems (STS), numerous applications exist, such as STS in companies [34], STS in management information systems (MIS) [35], and STS for quality assessment [36]. Specifically, there are other uses related to education, such as STS in schools [37], blended doctoral program [38], mobile learning [39], distance learning for professional development [40], and e-learning and blended learning [41].

From a purely employability-based perspective, research takes into account the labor markets transitions [42] and the skills gaps existing in modern graduates [43]. As will be seen, it also considers career development learning, experience, skills, emotional intelligence, and reflection-evaluation [44]. On the other hand, the proposed framework designs an e-learning for employability related to ICT that takes into account micro level factors related to individual circumstances [45], as well as variables related to access and use of information, group work, opinions about decentralized decisions, creativity and interdisciplinarity in companies, and biodemographic and psychosocial variables [46]. In particular, the framework takes into account issues related to perceived employability and career self-management [47], as well as situation (social and individual) and personal (objective and subjective) dimensions [48].

Figure 1 shows the model for the STELEM framework. On the one hand, it takes into account the socio-technical e-learning system, according to its social (organization, and students) and technical (ICT, and learning tasks) subsystems. On the other hand, it integrates indicators related to online students' employability, which are related to several criteria: (i) skills (literacy; digitalness; collaboration), which are needed to live in the 21st century; (ii) knowledge (knowledge acquisition; knowledge conversion), which are important for learning in knowledge societies; (iii) dispositional employability (resilience; proactivity; identity; openness), which is a predisposition to work and career adaptability; (iv) labor markets (motivation; organizational culture; employment security), which capture feelings about future external factors that influence jobs and work situations; (v) citizenship (media empowerment), which is necessary for democratic and multicultural societies; and (vi) educational attainment (educational social capital), which is a key variable in employment.

It is therefore key to prove whether there is a useful framework for analyzing online education effects on e-learners' employability, and for taking into account many personal, organizational, and technological variables. This situation is tested by analyzing and validating results related to two psychometric scales. Moreover, other variables are proposed for adding other needed variables to this scale and generating the global STELEM framework. Thus, the two following hypotheses are

defined, which are proved below by using psychometrics in a case study related to *Alumni* from the *Universitat Oberta de Catalunya (UOC)*, a fully online university based in Barcelona:

Hypothesis 1. *There is a psychometric scale valid for measuring socio-technical factors in fully online universities. According to the socio-technical systems theory, this scale has four sub-scales: ICT, learning tasks, students, and organization.*

Hypothesis 2. *There is a psychometric scale valid for measuring employability factors existing in students enrolled in fully online universities. According to the literature related to employability, this scale has fourteen sub-scales: educational social capital; media empowerment; knowledge acquisition; knowledge conversion; literacy; digitalness; collaboration; resilience; proactivity; identity; openness; motivation; organizational culture; and employment security.*

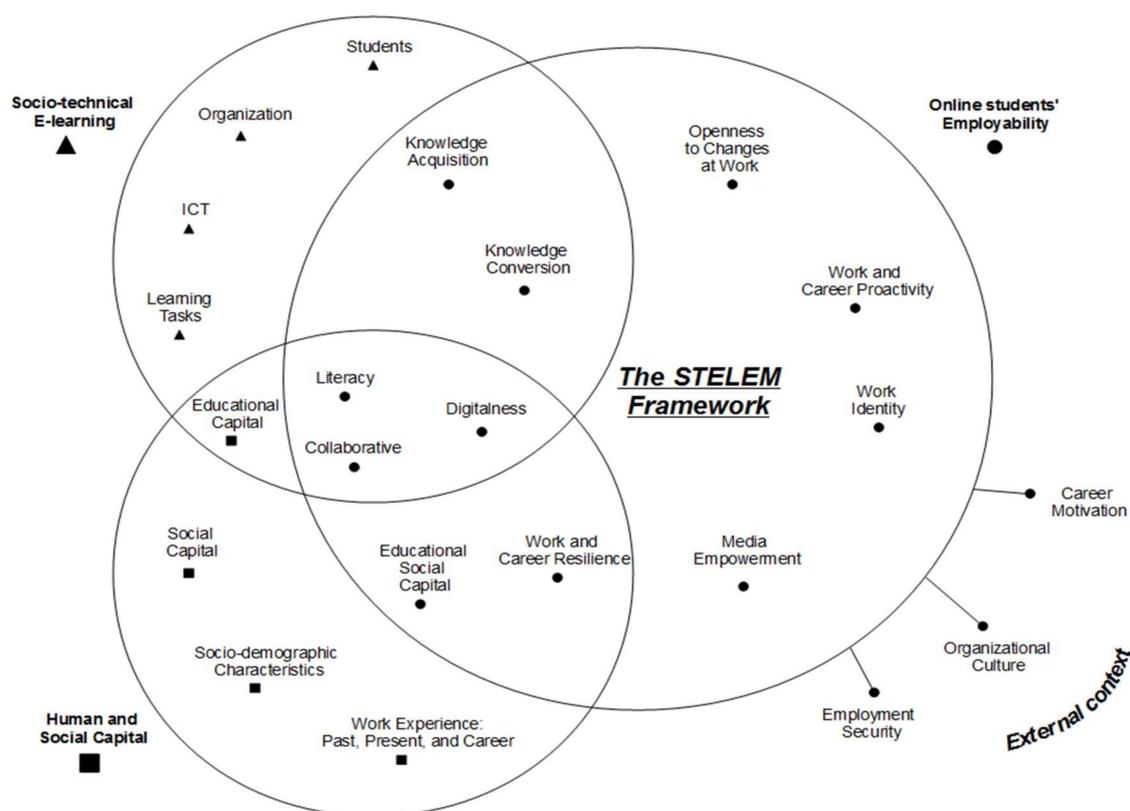


Figure 1. Model for the Socio-Technical E-learning Employability System of Measurement (STELEM) framework.

3. Methodology

3.1. Items for the Socio-Technical Fully Online University Scale

Several groups of items were designed for this research, according to their factors. Table 1 shows the four dimensions considered in socio-technical systems [49], which were adapted to a fully online university: ICT, learning tasks, students, and organization. The sixteen items defined to measure the socio-technical factors in the case study are shown as well, according to many authors, who served as guidelines for the design of the items.

These items had to do with the four socio-technical factors:

- ICT: digital content, various ICT, devices, and adaptation.
- Learning tasks: well-defined, specific, time-saving, and educational resources.
- Students: needs, support, usability, and habits.
- Organization: interactions, non-hierarchical structure, adaptation, and open culture.

Table 1. Dimensions, items, and references for the socio-technical fully online university scale.

Dimensions	Items	References
Question: The whole completed online education was designed to...		
ICT	<ul style="list-style-type: none"> –Allow all types of digital content –Allow various information and communication technologies –Access with more digital devices –Agile adaptation to technological changes 	[50–53]
Learning tasks	<ul style="list-style-type: none"> –Help learning through well-defined tasks –Focus student attention on specific tasks and actions –Establish a time-saving order to complete the tasks –Give access to more educational resources 	[54–56]
Students	<ul style="list-style-type: none"> –Be flexible and adaptable to the needs of students –Offer great diversity of helping and personal supporting –Give usability (ease of use for students) –Make recommendations regarding study habits 	[50,52–54,56–63]
Organization	<ul style="list-style-type: none"> –Solve problems with interactions without hierarchies –Maintain a non-hierarchical communicative structure –Adapt continuously to educational and pedagogical changes –Have an open culture (freedom, creativity, and cooperation) 	[50,51,54,56,58,60]
Answers (Likert scale): Strongly disagree (1), Disagree (2), Neither agree nor disagree (3), Agree (4), Strongly agree (5)		

3.2. Items for the Online Students' Employability Scale

Table 2 shows the dimension that was taken into account for measuring issues related to educational social capital. A list of references was used to define items relating to the highest level of education successfully completed by family, close friends, and close co-workers.

Table 2. Dimensions, items, and references for the online students' employability scale: educational social capital subscale.

Dimensions	Items	References
Question: Highest level of education successfully completed in your ...		
Educational social capital	<ul style="list-style-type: none"> –Family –Close friends –Close co-workers 	[64–79]
Answers (Likert scale): Primary, Secondary, Post-secondary non-tertiary, Graduate (Bachelor), and Postgraduate (Master, etc.).		

As before, Table 3 shows the dimension related to the media empowerment subscale and its corresponding list of references about public participation, social activity, integration, citizenship, media content creation, media use, media knowledge, and balanced media use.

Table 3. Dimensions, items, and references for the online students' employability scale: media empowerment subscale.

Dimensions	Items	References
Question: With regard to the media and the news, the online education finished helped to...		
Media empowerment	<ul style="list-style-type: none"> -Active participation in civil and political life -Acting socially against aspects of life that do not work properly. -Feeling more integrated into groups, communities, associations, etc. -Gaining more knowledge about my rights as a citizen. -Creating own messages and content related to news. -Using more media -Knowing more media -Using the media effectively 	[80–98]
Answers (Likert scale): Strongly disagree (1), Disagree (2), Neither agree nor disagree (3), Agree (4), Strongly agree (5)		

Table 4 shows the dimension related to the knowledge acquisition subscale and its corresponding list of authors related to knowledge on when, how, where, if, how much/many, and why.

Table 4. Dimensions, items, and references for the online students' employability scale: knowledge acquisition subscale.

Dimensions	Items	References
Question: The online training helped you to incorporate knowledge about...		
Knowledge acquisition	<ul style="list-style-type: none"> -Knowing when -Knowing how -Knowing where -Knowing if -Knowing how much/many -Knowing why 	<ul style="list-style-type: none"> [99,100] [45] [101–114]
Answers (Likert scale): Strongly disagree (1), Disagree (2), Neither agree nor disagree (3), Agree (4), Strongly agree (5)		

Table 5 shows the dimension related to the knowledge conversion subscale and its corresponding list of references related to knowledge on combination, externalization, internalization, and socialization.

Table 5. Dimensions, items, and references for the online students' employability scale: knowledge conversion subscale.

Dimensions	Items	References
Question: The online training helped you to transform knowledge through...		
Knowledge conversion	<ul style="list-style-type: none"> -Combination (synthesizing, generating and sharing documents, etc.) -Externalization (expressing ideas in texts, words, information, formulas, etc.) -Internalization (updating and adding new knowledge, experimenting and making them my own, etc.) -Socialization (learning from other people, sharing and exchanging ideas, etc.) 	[115–123]
Answers (Likert scale): Strongly disagree (1), Disagree (2), Neither agree nor disagree (3), Agree (4), Strongly agree (5)		

Table 6 shows the dimensions related to five employability subscales that are very useful to employability measurement, according to a list of their corresponding references:

- Literacy: about writing, reading, and written expression

- Digitalness (digitality): about computers, ICT abilities, and know digital
- Collaboration: about teamwork, cooperation, learning from peers, and leadership
- Resilience: about self-confidence, self-esteem, self-efficacy, adaptation, work-life balance, and flexibility.
- Proactivity: about identifying labor market demands, labor market dynamics, job offers, handling a job interview, writing a c.v., job searching, a critical analysis of my profile, and closing sales.

Table 6. Dimensions, items, and references for the online students' employability scale.

Dimensions	Items	References	
Question: The completed online education developed skills oriented to...			
Literacy	-Writing	[100]	
	-Reading	[101]	
	-Written expression	[111]	
		[112]	
Digitalness	-Computers	[124–131]	
	-ICT abilities	[101]	
	-Know digital	[45]	
		[111,112]	
Collaboration	-Teamwork	[126]	
	-Cooperation	[100,101]	
	-Learn from peers and fellow students	[45]	
	-Leadership	[111,112]	
		[60]	
Resilience	-Self-confidence	[132]	
	-Self-esteem	[45]	[141]
	-Self-efficacy	[133–140]	[142]
	-Adaptation to circumstances		[143]
	-Work-life balance		[144]
	-Flexibility		[145]
			[146]
Proactivity	-Identifying labor market demands		[147]
	-Understanding labor market dynamics	[100]	[148]
	-Analyzing job offers according to my profile	[45]	[149]
	-Handling a job interview	[151–154]	[132]
	-Writing a cover letter and an adapted cv		[150]
	-Persisting in my job search		[151]
	-A critical analysis of my profile		
	-Closing sales		
Answers (Likert scale): Strongly disagree (1), Disagree (2), Neither agree nor disagree (3), Agree (4), Strongly agree (5)			

Table 7 shows the dimensions related to two employability subscales and their corresponding list of references:

- Identity: about teams coordinating, assumptions of a key role, developing new projects, new tasks, and new responsibilities.
- Openness: about job searching, getting a job, changing job or sector, and wage increases

Table 7. Dimensions, items, and references for the online students' employability scale: identity and openness subscales.

Dimensions	Items	References
Question: The completed online education had an impact on...		
Identity	-Coordinating teams and problem management	
	-Assumption of key role in decision-making	[126]
	-Developing new projects, actions, strategies, etc.	[141,151]
	-Assumption of new tasks or projects with high visibility	[155,156]
	-Assumption of new roles or responsibilities	
Openness	-Job searching	
	-Getting a job	[141,151]
	-Changing job or sector	[157–159]
	-Wage increases	
Answers (Likert scale): None (1), Some (2), Quite a bit (3), A extreme amount (4), All (5)		

Table 8 shows the dimensions related to three employability subscales and their corresponding list of references:

- Motivation: about technical, personal, and instrumental skills, continuous training, ICT for mobility, and knowledge intensive work.
- Organizational culture: about companies and continuous learning, open workplaces, formal, informal, and technological structures, relationships, people, and social capital.
- Employment security: part-time, temporary jobs, and variable pay

Table 8. Dimensions, items, and references for the online students' employability scale: identity and openness subscales.

Dimensions	Items	References
Question: The future depends on...		
Motivation	-Technical skills will be important	[141–148]
	-Personal skills will be important	[132]
	-Instrumental skills will be important	[149,150]
	-Work will need continuous training	[160–166]
	-Work will require more ICT for mobility	
	-Work will be very knowledge intensive	
Organizational culture	-Companies will create conditions for continuous learning, relationships, etc.	
	-Workplaces will be much more open, flexible, informal, etc.	
	-Formal and informal structures, and technologies will be equally important	[160]
	-People, culture and relationships will be important	[167–176]
	-Who I work with will be more important than what job I do	
Employment security	-Social capital will be a key factor for professional development	
	-Part-time jobs will replace full-time jobs	[177–182]
	-Temporary jobs will replace fixed jobs	[160]
	-Variable pay will replace fixed pay	
Answers (Likert scale): Strongly disagree (1), Disagree (2), Neither agree nor disagree (3), Agree (4), Strongly agree (5)		

3.3. Fieldwork and Sample

A questionnaire was designed with all these items. A blueprint (the test specification) was used as a tool for designing the questionnaire [183], which was externally validated by a professor at the

University of Barcelona, who was an expert in educational research methodology. A pilot process with the online questionnaire was made with a sample of 300 students from the database of the UOC Experimentation Laboratory at the eLearn Center.

After a pilot study, and taking into account that the subjects of the analysis were UOC alumni, the UOC Alumni Department sent official invitations to 55,298 alumni. These subjects of analysis were clearly the alumni of an online university because of the research topic: socio-technical e-learning systems and employability. The fieldwork was carried out between May and June 2016. Thus, 550 answers (49.5% women and 50.5% men, average age = 46 years old) were validated, with a response rate = 1.0%, according to other surveys with alumni [184,185]. Some reasons that explain this rate are: alumni use email addresses that are different from those from the UOC, alumni work in companies and no longer have relations with the UOC, fieldwork was developed during the pre-vacational season, and the duration of the questionnaire could have been excessive for people who are no longer studying at the UOC and who are workers. The maximum error margin of $\pm 4.16\%$ ($p = q = 0.50$, confidence level of 95.5%, and a finite population).

3.4. Data Analysis

In order to test the hypotheses, the software IBM SPSS Statistics for Windows version 22.0, R version 3.4.0 [186] and the R package lavaan version 0.5–23 were used [187]. The measurement model was reflective (the constructs were the cause of the items) in the four STS constructs (ICT, learning tasks, students, and organization), according to the approach for technological factors [188], and taking into account that their items were homogeneous [189]. The employability scale, as a latent variable, was reflective, according to the importance of how highly its items correlated among them and several guidelines [136,190].

The total sample ($n = 550$) was randomly divided into two subsets to perform an exploratory factor analysis ($n = 300$) and confirmatory factor analysis ($n = 250$), meeting the usual requirements of the minimum number of individuals to be analyzed: 150 subjects for both factorial analyses [191,192]. Because of its importance, other more restrictive conditions were also satisfied: population of 300 or more, and a theoretical model sub-sample of 200 or more [193,194].

4. Results

4.1. Structural Validity and Reliability of the Socio-Technical Fully Online University Scale

Table 9 shows the results of the exploratory and confirmatory factor analyses. A Principal Component Analysis (PCA) (rotation method: Varimax with Kaiser Normalization) showed an acceptable four-factors (ICT, learning tasks, students, and organization) structure (KMO = 0.939, with a significant Bartlett's test, $p = 0.000$), with factor loadings ranging from 0.541 to 0.849, communalities higher than 0.667, and 81.819% of the total variance explained. The reliability analysis of the four compounded factors showed a Cronbach's α of 0.960 (four factors together), 0.950 (ICT), 0.909 (learning tasks), 0.913 (students), and 0.901 (organization).

A Confirmatory Factor Analysis (CFA) with the Diagonally Weighted Least Squares (DWLS) estimation method tested that measures were consistent with the four theoretical factors, which had valid estimations for their items and their four latent variables ($p < 0.000$). Global fits (CFI = 0.999; TLI = 0.998; RMSEA = 0.049; SRMR = 0.039; NNFI = 0.998; RFI = 0.996; NFI = 0.997; IFI = 0.999; RNI = 0.999) were fine as well [195,196].

Table 10. Cont.

Items	Exploratory Factor Analysis Rotated Component Matrix													
	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14
WORK IDENTITY														
Assumption of new tasks or projects					0.781									
Developing new projects, etc.					0.762									
Coordinating teams and problems					0.720									
Assumption of role in decision-making					0.718									
Assumption of new responsibilities					0.712									
EMPLOYMENT SECURITY														
Temporary jobs will replace fixed jobs						0.890								
Part-time jobs will replace full-time jobs						0.843								
Variable pay will replace fixed pay						0.778								
ORGANIZATIONAL CULTURE														
People will be important							0.824							
Important who I work with							0.725							
Social capital will be a key factor							0.704							
Workplaces will be open, etc.							0.631							
Conditions for learning, etc.							0.613							
Formal, informal, and technologies will be equally important							0.568							
COLLABORATIVE SKILLS														
Teamwork								0.808						
Cooperation								0.783						
Learning with peers								0.637						
Leadership								0.606						
LITERACY SKILLS														
Writing									0.859					
Reading									0.793					
Written expression									0.739					

Table 10. Cont.

Items	Exploratory Factor Analysis Rotated Component Matrix													
	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14
DIGITALNESS														
Computers										0.724				
ICT abilities										0.709				
Know digital										0.675				
MEDIA EMPOWERMENT														
Using more media											0.802			
Knowing more media											0.788			
Active participation in civil life											0.755			
Using the media effectively											0.755			
Acting socially											0.753			
Feeling more integrated into groups											0.722			
Gaining knowledge about my rights											0.720			
Creating own messages and content											0.680			
KNOWLEDGE CONVERSION														
Internalization												0.739		
Combination												0.723		
Externalization												0.715		
Socialization												0.603		
KNOWLEDGE ACQUISITION														
Knowing how													0.707	
Knowing when													0.684	
Knowing if													0.674	
Knowing why													0.669	
Knowing how much/many													0.658	
Knowing where													0.598	
EDUCATIONAL SOCIAL CAPITAL														
Friends' highest education level														0.769
Family's highest education level														0.684
Co-workers' highest education level														0.677
Statistics	KMO = 0.927. χ^2 Bartlett = 18,768.891 p-value = 0.000. Comunalities > 0.536. Total Variance = 74.801% Cronbach's alpha: F1 = 0.913; F2 = 0.908; F3 = 0.945; F4 = 0.842; F5 = 0.938; F6 = 0.819; F7 = 0.869; F8 = 0.852; F9 = 0.918; F10 = 0.879; F11 = 0.945; F12 = 0.909; F13 = 0.922; F14 = 0.691; total = 0.969													

Source: own elaboration.

4.2.2. Confirmatory Factor Analysis

Table 11 shows the results of a CFA with the Diagonally Weighted Least Squares (DWLS) estimation method: the measures were consistent with the fourteen theoretical factors, which had valid estimations for their items and their fourteen latent variables ($p < 0.000$). Global fits (CFI = 0.993; TLI = 0.992; RMSEA = 0.063; SRMR = 0.067; NNFI = 0.992; RFI = 0.984; NFI = 0.985; IFI = 0.993; RNI = 0.993) were fine as well [195,196].

Table 11. Confirmatory factor analysis: online students' employability scale.

Items	Confirmatory Factor Analysis DWLS Estimator	
	Latent Variables	Variances
OPENNESS TO CHANGES AT WORK		
Getting a job	1.000	
Job searching	1.008 ***	0.845 ***
Changing of job or sector	0.891 ***	
Wage increases	0.983 ***	
WORK AND CAREER RESILIENCE		
Work-life balance	1.000	
Adaptation to circumstances	1.160 ***	
Self-efficacy	1.183 ***	0.600 ***
Self-confidence	1.249 ***	
Self-esteem	1.199 ***	
Flexibility	1.184 ***	
WORK AND CAREER PROACTIVITY		
Analyzing of job offers	1.000	
Understanding labor market	1.027 ***	
Identifying labor market demands	1.060 ***	
Handling a job interview	1.082 ***	0.803 ***
Writing a cover letter and a cv	1.045 ***	
Persistence in job search	0.929 ***	
Critical analysis of my profile	0.957 ***	
Closing sales	0.729 ***	
CAREER MOTIVATION		
Instrumental skills will be important	1.000	
Technical skills will be important	1.074 ***	
Personal skills will be important	1.240 ***	0.489 ***
Work will be knowledge intensive	0.996 ***	
Work will need continuous training	0.854 ***	
Work will require ICT for mobility	1.135 ***	
WORK IDENTITY		
Assumption of new tasks or projects	1.000	
Developing new projects, etc.	0.968 ***	0.901 ***
Coordinating teams and problems	0.939 ***	
Assumption of role in decision-making	1.015 ***	
Assumption of new responsibilities	0.964 ***	
EMPLOYMENT SECURITY		
Temporary job will replace fixed jobs	1.000	0.575 ***
Part-time job will replace full-time jobs	1.053 ***	
Variable pay will replace fixed pay	1.034 ***	
ORGANIZATIONAL CULTURE		
People will be important	1.000	
Important who I work with	0.646 ***	
Social capital will be a key factor	0.886 ***	0.745 ***
Workplaces will be open, etc.	0.796 ***	
Conditions for learning, etc.	0.954 ***	
Formal, informal, and technologies will be equally important	0.868 ***	

Table 11. Cont.

Items	Confirmatory Factor Analysis DWLS Estimator	
	Latent Variables	Variances
COLLABORATIVE SKILLS		
Teamwork	1.000	
Cooperation	0.992 ***	0.725 ***
Learning with peers	0.988 ***	
Leadership	0.983 ***	
LITERACY SKILLS		
Writing	1.000	
Reading	1.038 ***	0.875 ***
Written expression	0.981 ***	
DIGITALNESS		
Computers	1.000	
ICT abilities	1.106 ***	0.677 ***
Know digital	1.181 ***	
MEDIA EMPOWERMENT		
Using more media	1.000	
Knowing more media	0.950 ***	
Active participation in civil life	0.942 ***	
Using the media effectively	0.955 ***	0.934 ***
Acting socially	0.952 ***	
Feeling more integrated into groups	0.911 ***	
Gaining knowledge about my rights	0.936 ***	
Creating own messages and content	0.815 ***	
KNOWLEDGE CONVERSION		
Internalization	1.000	
Combination	1.086 ***	0.604 ***
Externalization	1.136 ***	
Socialization	1.084 ***	
KNOWLEDGE ACQUISITION		
Knowing how	1.000	
Knowing when	1.037 ***	
Knowing if	0.957 ***	0.772 ***
Knowing why	0.915 ***	
Knowing how much/many	0.906 ***	
Knowing where	1.022 ***	
EDUCATIONAL SOCIAL CAPITAL		
Friends' highest education level	1.000	0.720 *
Family's highest education level	0.663 *	
Co-workers' highest education level	0.705 *	
Statistics	CFI = 0.993; TLI = 0.992 RMSEA = 0.063; SRMR = 0.067 NNFI = 0.992; RFI = 0.984; NFI = 0.985 IFI = 0.993; RNI = 0.993 $\chi^2 = 4,353.675; p = 0.000$	

***: $P(> |z|) < 0.001$; *: $P(> |z|) < 0.05$.

5. Discussion

5.1. Overview of Key Findings

The educational process between students' enrollment and exit from higher education systems can be recognized as a black-box [197]. In this sense, the research has added new empirical evidence in terms of its inputs (students) and outputs (employability), which are interrelated as a system of e-learning and employability [198]. Thus, the research has proved that there are two psychometric scales valid for measuring lifelong e-learning for employability. On the one hand, there is a scale related to socio-technical factors in fully online universities, which has four sub-scales: ICT, learning tasks, students, and organization. On the other hand, there is a scale for measuring employability according to fourteen necessary factors related to skills necessary in order to be employable in

labor markets: educational social capital; media empowerment; knowledge acquisition; knowledge conversion; literacy; digitalness; collaboration; resilience; proactivity; identity; openness; motivation; organizational culture; and employment security.

In this way, these scales help to open the black-box of lifelong e-learning to employability by deepening many latent dimensions that exist in the literature. The approach takes into account the highly opaque process of skills acquisition, which exists in distance learning [199]. Moreover, the set of employability skills analyzed is useful for studying the black-boxed relationships between training and economics [200], learning management systems [201], knowledge in higher education [202], and entrepreneurship education programs [203]. Some of the sub-scales are related to factors that influence users' demand for lifelong learning in higher education: motivation, conflicts/difficulties and career-development [204].

Considering the fact that people's working life is increasing because of the consequences of the financial crisis and its large impact on labor supply [205], the number of students in formal and non-formal training will rise in the future. This is why the findings are useful for measuring successful lifelong e-learning strategies that are aimed toward employability. From that perspective, the STELEM framework needs information about other variables related to human and social capital related to employability and education. In this sense, Table 12 shows items related to socio-demographic characteristics, as well as educational experience, work experience, and social capital, which are key dimensions and factors in employability issues [141].

Table 12. Human and social capital related to employability.

Indicators
SOCIO-DEMOGRAPHIC CHARACTERISTICS
<ul style="list-style-type: none"> • Age • Gender • Number of adults in the household • Number of children under 18 in the household • Number of inhabitants in the city
EDUCATIONAL CAPITAL
<ul style="list-style-type: none"> • Highest level of education successfully completed (ISCED 2011) • STEM education: Economy and Business, Computers, Multimedia and Telecommunications, Health, and Psychology and Education • Non-STEM education: Arts and Humanities, Law and Political Sciences, Languages, Information and Communication, Psychology and Education, and Others
WORK EXPERIENCE CAPITAL
Past:
<ul style="list-style-type: none"> • Year of starting as a worker • Labor status when e-learning began • Occupation (ISCO) when e-learning began
Present:
<ul style="list-style-type: none"> • Labor status • Occupation (ISCO) • Working hours • Duration of employment contract • Variable pay • Firm size • Activity sector of firm • Knowledge worker
Career:
<ul style="list-style-type: none"> • Career path • Career path during e-learning • Career pattern
SOCIAL CAPITAL
<ul style="list-style-type: none"> • Number of close friends • Number of close co-workers

Specifically, several references have been used to define this list: highest level of education successfully completed ISCED 2011 [206]; science, technology, engineering, and mathematics (STEM) disciplines and non-STEM studies [207]; career paths and patterns [208–212]; knowledge worker [213–215]; and social capital [67,143,216,217].

5.2. Strengths and Limitations

Relationships between education and employment are contemporaneous with maturing information and communication technologies, according to the large number of terms in the field of education that relate to employment: adult vocational education, further education, pre-service training, in-service training, retraining, vocational education [218]. In this context, several approaches and frameworks can be integrated, since they change only slightly in their terminologies [219]. In this way, the STELEM framework offers a point of view that integrates many aspects and issues related to lifelong e-learning and employability. It presents an instrument for measuring skills outcomes, which always have a multitude of problems in how they are assessed [220].

The STELEM framework has two reflective psychometric scales and a list of indicators that are valid for defining a formative index. Although there are two types of measurement models [221], which are methodologically and psychometrically different [190], this kind of combination between reflective and formative latent variables is valid in human capital measurement [222].

The scale of employability takes into account various aspects related to skills that undergraduates are aware that they have to develop, such as communication, management, self and career management, and interpersonal abilities [223]. It has to do with the labor crisis, the heterogeneity and individuality of workers in a service economy, falling labor movements, and job loss as a generator of capital and value [224]. Moreover, it includes a media empowerment sub-scale that is a good approach to lifelong learning needs related to ethics and politics existing in western countries [225].

Nevertheless, the research has some limitations. Answers from an online self-reported questionnaire linked to interviewees' own behavior could be biased [226]. On the one hand, the sample of online students at the UOC cannot be generalized to any online university, either. On the other hand, the way of working at UOC could be different to that of other open universities. Moreover, this questionnaire was aimed to find out several e-learning and employability skills' latent variables in alumni, but future research on the pre-professional identity of graduates must also be conducted for employability estimations [227].

Because culture is important for e-learning adoption [228], this framework takes into account an important variable related to media empowerment and organizational culture, but it needs further research and indicators related to cultural values and situations. It is also important to measure the black-box formed by students that are organized, since they can be considered as a system [198]. Thus, this is another line of future research linked to indicators or latent constructs related to students' opinions and behaviors as a whole. In this sense, it will be very interesting to study other issues tied to the quality of courses, which can be viewed from the point of view of system flexibility [51]. The socio-technical system approach can help here, in addition to being useful for obtaining knowledge on students' satisfaction, in the same way that STS is useful in obtaining information on job satisfaction [229].

Another issue that has to be overcome is a focus on employability that depends on individual aspects, which is false [230]. In this sense, it is necessary to think about how to add indicators related to macro level factors, such as globalization, labor markets, regulatory and welfare regimes, and employment policy, which are very important to young people, older workers, and migrants [231]. The STELEM framework includes indicators related to external context (employment security, organizational culture, and career motivation), but this approach from macro levels should be improved. From another point of view, there are many historical definitions and meanings of employability, such as dichotomic, socio-medical, manpower policy, flow, labor market performance, initiative, and interactive employability [232], and the word has two dimensions: absolute/internal

and relative/external to the individual [233]. Thus, relationships and activities beyond learning and work are important as well [234]. Finally, another approach to be considered has to do with employers' point of view on employability [235].

6. Conclusions

During the recent past decades, globalization, the economic crisis, ICT development, and labor markets have been demanding more and more skills and abilities from people and workers. In this way, the development of employability skills via fully online universities must adopt a systemic approach to aspects of the socio-technical systems related to e-learning and to the micro, meso, and macro level factors that are related to individual employability. By adding empirical findings to relationships existing between human capital theory and lifelong online education, the research explained here has proposed a framework for a Socio-Technical E-learning Employability System of Measurement (STELEM). The STELEM framework contributes to the development of many employability skills demanded in the 21st century, such as educational social capital, media empowerment, knowledge acquisition and conversion, literacy, digitalness, collaboration, resilience, proactivity, identity, openness, motivation, organizational culture, and employment security. Moreover, it uses a holistic approach for understanding online education institutions as a whole system based on their ICT, learning tasks, as well as their student-centered and organizational factors. The research provides two new psychometrical scales that are useful for the evaluation, monitoring, and assessment of relationships and influences between socio-technical e-learning organizations and employability skills development. Moreover, it proposes a set of indicators related to human and social capital, which is valid in employability contexts. All these approaches and results are issues that should be considered in any future citizens and workers training plan. In this sense, this framework can be useful as an instrument for modeling public initiatives and labor policies related to employment and social inclusion by means of lifelong online training.

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References

1. ACNUR. Tendencias Globales. Desplazamiento Forzado en 2016. 2016. Available online: www.acnur.es/PDF/Tendencias2016.pdf (accessed on 25 February 2016).
2. Torrent-Sellens, J. Economia compartida i consum col·laboratiu. Cap a les noves interpretacions, identitats, motivacions i evidències de l'intercanvi. In *Papers de Discussió dels Estudis d'Economia i Empresa*; Universitat Oberta de Catalunya: Barcelona, Spain, 2017; Volume 17, pp. 1–61.
3. Roberts, D. Post-truth Politics. 2010. Available online: <http://grist.org/article/2010-03-30-post-truth-politics/> (accessed on 3 February 2017).
4. Peters, M.A. Education in a Post-truth World. *Educ. Philos. Theory* **2017**, *49*, 1–4. [CrossRef]
5. Aceto, S.; Borotić, S.; Devine, J.; Fischer, T. *Mapping and Analysing Prospective Technologies for Learning*; Publications Office of the European Union: Luxembourg, 2014.
6. Becker, G.S. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, 3rd ed.; Columbia University Press: New York, NY, USA, 1993.
7. Schultz, T.W. Investment in Human Capital. *Am. Econ. Rev.* **1961**, *51*, 1–17.
8. Elfert, M. UNESCO, the Faure Report, the Delors Report, and the Political Utopia of Lifelong Learning. *Eur. J. Educ.* **2015**, *50*, 88–100. [CrossRef]

9. Gilead, T. Education and the Logic of Economic Progress. *J. Philos. Educ.* **2012**, *46*, 113–131. [[CrossRef](#)]
10. Leuven, E.; Oosterbeek, H. *Overeducation and Mismatch in the Labor Market*; Institute for the Study of Labor (IZA): Bonn, Germany, 2011.
11. Sanders, M. Skill Bias in an Endogenous Growth Model: Evaluating the Case for Market Size and Acceleration Effects. *Macroecon. Dyn.* **2013**, *17*, 802–829. [[CrossRef](#)]
12. Tomlinson, M.; Holmes, L. *Graduate Employability in Context. Theory, Research and Debate*; Palgrave Macmillan: London, UK, 2017.
13. Fleming, P. The Human Capital Hoax: Work, Debt and Insecurity in the Era of Uberization. *Organ. Stud.* **2017**, *38*, 691–709. [[CrossRef](#)]
14. Benkler, Y. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*; Yale University Press: New Haven, CT, USA, 2008.
15. OECD. *The Well-Being of Nations. The Role of Human and Social Capital*; OECD Publishing: Paris, France, 2001.
16. Jarvis, P. *Globalisation, Lifelong Learning and the Learning Society. Sociological Perspectives*; Routledge: London, UK, 2007.
17. Starkey, K.; Tempest, S. The Winter of Our Discontent: The Design Challenge for Business Schools. *Acad. Manag. Learn. Educ.* **2009**, *8*, 576–586. [[CrossRef](#)]
18. Jarvis, P. *Adult Education and Lifelong Learning. Theory and Practice*, 3rd ed.; Routledge: London, UK, 2004.
19. Jaeger, W. *Paideia: The Ideals of Greek Culture; In Search of the Divine Centre*; Basil Blackwell: Oxford, UK, 1946; Volume 1.
20. Platón, M.C. *Paideia: Protágoras, de La República y de Las Leyes*; Biblioteca Nueva: Madrid, Spain, 2007.
21. Arrow, K.J. The theory of discrimination. *Discrim. Labor Mark.* **1973**, *3*, 3–33.
22. Piore, M.J.; Doeringer, P.B. *Internal Labor Markets and Manpower Analysis*; Harvard University; Massachusetts Institute of Technology: Cambridge, MA, USA, 1970.
23. Keeley, B. *Human Capital: How What You Know Shapes Your Life*; OECD: Paris, France, 2007.
24. Jarvis, P. *The Routledge International Handbook of Lifelong Learning*; Routledge: New York, NY, USA, 2009.
25. Willcox, K.E.; Sarma, S.; Lippel, P.H. *Online Education: A Catalyst for Higher Education Reforms*; MIT: Cambridge, MA, USA, 2016.
26. Andrews, R. Does e-learning require a new theory of learning? Some initial thoughts1/Erfordert E-Learning eine neue Theorie des Lernens? Einige erste Überlegungen. *J. Educ. Res. Online Münster* **2011**, *3*, 104–121.
27. Garrison, D.R.; Anderson, T. *E-Learning in the 21st Century: A Framework for Research and Practice*; RoutledgeFalmer: London, UK, 2003.
28. Uskov, V.L.; Howlett, R.J.; Jain, L.C. *Smart Education and Smart e-Learning*; Springer: Cham, Switzerland, 2015; Volume 41.
29. Aristotle. *Metaphysics*. Ross, W., Ed.; 350 AC. Available online: <http://archive.org/details/AristotleOrganon> (accessed on 29 October 2007).
30. Whitworth, B.; de Moor, A. *Handbook of Research on Socio-Technical Design and Social Networking Systems*; Information Science Reference: Hershey, PA, USA, 2009.
31. Cherns, A. Principles of Sociotechnical Design Revisited. *Hum. Relat.* **1987**, *40*, 153–162. [[CrossRef](#)]
32. Haythornthwaite, C.; Andrews, R. *E-Learning. Theory and Practice*; SAGE Publications: Los Angeles, CA, USA, 2011.
33. Kanfer, R.; Heggestad, E.D. Motivational traits and skills: A person-centered approach to work motivation. *Res. Organ. Behav.* **1997**, *19*, 1–56.
34. Appelbaum, S.H. Socio-technical systems theory: An intervention strategy for organizational development. *Manag. Decis. London* **1997**, *35*, 452–463. [[CrossRef](#)]
35. Bostrom, R.P.; Heinen, J.S. MIS Problems and Failures: A Socio-Technical Perspective PART II: The Application of Socio-Technical Theory. *MIS Quart.* **1977**, *1*, 11–28. [[CrossRef](#)]
36. Palvia, S.C.; Sharma, R.S.; Conrath, D.W. A socio-technical framework for quality assessment of computer information systems. *Ind. Manag. Data Syst.* **2001**, *101*, 237–251. [[CrossRef](#)]
37. Angeli, C.; Valanides, N. A Socio-Technical Analysis of Factors Affecting the Integration of ICT in Primary and Secondary Education. In *Handbook of Research on Literacy in Technology at the K-12 Level*; Idea Group: Hershey, PA, USA, 2006.

38. Erichsen, E.A.; DeLorme, L.; Connelley, R.; Okurut-Ibore, C.; McNamara, L.; Aljohani, O. Sociotechnical Systems Approach: An Internal Assessment of a Blended Doctoral Program. *J. Contin. High. Educ.* **2013**, *61*, 23–34. [CrossRef]
39. Krotov, V. Critical Success Factors in M-Learning: A Socio-Technical Perspective. *Commun. Assoc. Inf. Syst.* **2015**, *36*, 25–34.
40. Miller, C. A Socio-Technical Systems Approach to Distance Education for Professional Development. *Open Learn.* **1998**, *13*, 23–29. [CrossRef]
41. Wu, W.; Hwang, L.Y. The Effectiveness of E-Learning for Blended Courses in Colleges: A Multi-Level Empirical Study. *Int. J. Electr. Bus. Manag.* **2010**, *8*, 312–322.
42. Forrier, A.; Sels, L. The concept employability: A complex mosaic. *Int. J. Hum. Resour. Dev. Manag.* **2003**, *3*, 102. [CrossRef]
43. Jackson, D. An international profile of industry-relevant competencies and skill gaps in modern graduates. *Int. J. Manag. Educ.* **2010**, *8*, 29–58. [CrossRef]
44. Dacre Pool, L.; Sewell, P. The key to employability: Developing a practical model of graduate employability. *Educ. Train.* **2007**, *49*, 277–289. [CrossRef]
45. De Hoyos, M.; Green, A.E.; Barnes, S.-A.; Behle, H.; Baldauf, B.; Owen, D.; Institute for Prospective Technological Studies. *Literature Review on Employability, Inclusion and ICT, Report 2: ICT and Employability*; Joint Research Centre of the European Commission; Publications Office of the European Union: Luxembourg, 2013.
46. Pérez i Escoda, N. *Programa de Formació per a la Inserció Laboral*; Ediciones CEAC: Barcelona, Spain, 1996.
47. Jackson, D.; Wilton, N. Perceived employability among undergraduates and the importance of career self-management, work experience and individual characteristics. *High. Educ. Res. Dev.* **2017**, *36*, 747–762. [CrossRef]
48. Blanch, J.M. *Del Viejo al Nuevo Paro. Un Análisis Psicológico y Social*; PPU: Barcelona, Spain, 1990.
49. Leavitt, H.J. Applied Organizational Change in Industry: Structural, technological and humanistic approaches. In *Handbook of Organizations*; March, J.G., Ed.; Rand McNally: Chicago, IL, USA, 1965; pp. 1144–1170.
50. Lin, H.F.; Lee, G.G. Effects of socio-technical factors on organizational intention to encourage knowledge sharing. *Manag. Decis.* **2006**, *44*, 74–88. [CrossRef]
51. Wang, J.; Solan, D.; Ghods, A. Distance learning success—A perspective from socio-technical systems theory. *Behav. Inf. Technol.* **2010**, *29*, 321–329. [CrossRef]
52. Whitworth, B.; Banuls, V.; Sylla, C.; Mahinda, E. Expanding the Criteria for Evaluating Socio-Technical Software. *IEEE Trans. Syst. Man Cybern. Part A* **2008**, *38*, 777–790. [CrossRef]
53. Zuiderwijk, A.; Janssen, M.; Choenni, S.; Meijer, R.; Alibaks, R.S. Socio-technical impediments of open data. *Electron. J. EGov.* **2012**, *10*, 156–172.
54. Brannock, J.W. *Socio-Technical Systems Theory: A Study of the Degree to Which Organizational Structure, Process, and Technological Complexity Are Congruent in a United States Air Force Jet Engine Overhaul Facility*; University of Nebraska: Lincoln, NE, USA, 1981.
55. Kontoghiorghes, C. Reconceptualizing the learning transfer conceptual framework: Empirical validation of a new systemic model. *Int. J. Train. Dev.* **2004**, *8*, 210–221. [CrossRef]
56. Trist, E.L. *The Evolution of Socio-Technical Systems: A Conceptual Framework and an Action Research Program*; Ontario Ministry of Labour, Ontario Quality of Working Life Centre: Toronto, ON, Canada, 1981.
57. Lee, S.M.; Kim, K.; Paulson, P.; Park, H. Developing a socio-technical framework for business-IT alignment. *Ind. Manag. Data Syst.* **2008**, *108*, 1167–1181. [CrossRef]
58. Molleman, E.; Broekhuis, M. Sociotechnical systems: Towards an organizational learning approach. *J. Eng. Technol. Manag.* **2001**, *18*, 271–294. [CrossRef]
59. Salas, E.; Glickman, A.S. Comportamiento organizacional, teoría de sistemas socio-técnicos y calidad de vida laboral: La experiencia peruana. *Rev. Latinoam. Psicol.* **1990**, *22*, 69–82.
60. Stevens, M.J.; Campion, M.A. Staffing Work Teams: Development and Validation of a Selection Test for Teamwork Settings. *J. Manag.* **1999**, *25*, 207–228.
61. Frey, W. Socio-Technical Systems in Professional Decision Making. 2013. Available online: <http://cnx.org/content/m14025/1.9> (accessed on 27 March 2013).

62. Sharpe, R. What does it take to learn in next generation learning spaces? In *The Future of Learning and Teaching in Next Generation Learning Spaces*; Fraser, K., Ed.; Emerald Group Publishing Limited: Bingley, UK, 2014; pp. 123–145.
63. Wahlstedt, A.; Pekkola, S.; Niemelä, M. From e-learning space to e-learning place. *Br. J. Educ. Technol.* **2008**, *39*, 1020–1030. [[CrossRef](#)]
64. Beaulieu, L.J.; Israel, G.D.; Hartless, G.; Dyk, P. For whom does the school bell toll?: Multi-contextual presence of social capital and student educational achievement. *J. Soc.-Econ.* **2001**, *30*, 121–127. [[CrossRef](#)]
65. Bourdieu, P.; Sapiro, G.; McHale, B. Second Lecture. The New Capital: Introduction to a Japanese Reading of State Nobility. *Poet. Today* **1991**, *12*, 643–653. [[CrossRef](#)]
66. Ceja, M. Understanding the Role of Parents and Siblings as Information Sources in the College Choice Process of Chicana Students. *J. Coll. Stud. Dev. Baltim.* **2006**, *47*, 87–104. [[CrossRef](#)]
67. Coleman, J.S. Social Capital in the Creation of Human Capital. *Am. J. Sociol.* **1994**, *94*, S95–S120. [[CrossRef](#)]
68. Francis, B.; Wong, B. *What Is Preventing Social Mobility? A Review of the Evidence*; Association of School and College Leaders (ASCL): London, UK, 2013.
69. Girotti, C.; Pais, I. New Graduates Social Capital: Nodes and Ties in the Transition from University to the Job Market. *Sociol. Del Lav.* **2015**, *137*, 145–159.
70. Litz, D.; Hourani, B. Developing Educational Capital in Times of Change: The Experience of Abu Dhabi. In *Leveraging Social Capital in Systemic Education Reform*; Haslam, I.R., Khine, M.S., Eds.; Sense Publishers: Rotterdam, The Netherlands, 2016; pp. 115–141.
71. Martin, J.P.; Simmons, D.R.; Yu, S.L. The Role of Social Capital in the Experiences of Hispanic Women Engineering Majors. *J. Eng. Educ. Wash.* **2013**, *102*, 227–243. [[CrossRef](#)]
72. McNeal, R.B. Parental Involvement as Social Capital: Differential Effectiveness on Science Achievement, Truancy, and Dropping Out. *Soc. Forces* **1999**, *78*, 117–144. [[CrossRef](#)]
73. Piróg, D. The impact of degree programme educational capital on the transition of graduates to the labour market. *Stud. High. Educ.* **2016**, *41*, 95–109. [[CrossRef](#)]
74. Pishghadam, R.; Zabihi, R. Parental Education and Social and Cultural Capital in Academic Achievement. *Int. J. Engl. Ling.* **2011**, *1*, 50. [[CrossRef](#)]
75. Reay, D. Education and cultural capital: The implications of changing trends in education policies. *Cult. Trends* **2004**, *13*, 73–86. [[CrossRef](#)]
76. Scott, F. The Influence of Neighborhood, Family, School, and Student Dimensions of Social Capital on Academic Achievement: An Integrated Theoretical Framework. Master's Thesis, University of Montana, Missoula, MT, USA, 2007.
77. Stanton-Salazar, R.D.; Dornbusch, S.M. Social Capital and the Reproduction of Inequality: Information Networks among Mexican-Origin High School Students. *Sociol. Educ.* **1995**, *68*, 116–135. [[CrossRef](#)]
78. Strawn, C.L. *The Influences of Social Capital on Lifelong Learning among Adults Who Did Not Finish High School*; National Center for the Study of Adult Learning and Literacy: Cambridge, MA, USA, 2003; pp. 1–99.
79. Tierney, W.G. Fictive Kin and Social Capital: The Role of Peer Groups in Applying and Paying for College. *Am. Behav. Sci.* **2006**, *49*, 1687–1702. [[CrossRef](#)]
80. Arke, E.; Primack, B. Quantifying Media Literacy: Development, reliability, and validity of a new Measure. *Educ. Med. Inte.* **2009**, *46*, 53–65. [[CrossRef](#)]
81. Ashley, S.; Maksl, A.; Craft, S. Developing a News Media Literacy Scale. *J. Mass Commun. Educ.* **2013**, *68*, 7–21. [[CrossRef](#)]
82. Bier, M.; Schmidt, S.; Shields, D.; Zwarun, L.; Sherblom, S.; Primack, B.; Rucker, B. School-based Smoking Prevention with Media Literacy: A Pilot Study. *J. Med. Lit. Educ.* **2013**, *2*, 185–198.
83. Celot, P.; Pérez-Tornero, J.M. *Study on Assessment Criteria for Media Literacy Levels*; European Association for Viewers' Interests (EAVI): Brussels, Belgium, 2009.
84. Chang, C.S.; Liu, E.Z.F.; Lee, C.Y.; Chen, N.S.; Hu, D.C.; Lin, C.H. Developing and Validating a Media Literacy Self-Evaluation Scale (MLSS) for Elementary School Students. *Turk. Online J. Educ. Technol. TOJET* **2011**, *10*, 63–71.
85. Claro, M.; Preiss, D.D.; San-Martín, E.; Jara, I.; Hinostroza, J.E.; Valenzuela, S.; Nussbaum, M. Assessment of 21st Century ICT skills in Chile: Test Design and Results from High School Level Students. *Comput. Educ.* **2012**, *59*, 1042–1053. [[CrossRef](#)]

86. Duran, R.L.; Yousman, B.; Walsh, K.M.; Longshore, M.A. Holistic Media Education: An Assessment of the Effectiveness of a College Course in Media Literacy. *Commun. Quart.* **2008**, *56*, 49–68. [[CrossRef](#)]
87. Ferrés, J.; Piscitelli, A. Media Competence. Articulated Proposal of Dimensions and Indicators. *Comunicar* **2012**, *19*, 75–82. [[CrossRef](#)]
88. Koc, M.; Barut, E. Development and Validation of New Media Literacy Scale (NMLS) for University Students. *Comput. Hum. Behav.* **2016**, *63*, 834–843. [[CrossRef](#)]
89. Levin-Zamir, D.; Lemish, D.; Gofin, R. Media Health Literacy (MHL): Development and Measurement of the Concept among Adolescents. *Health Educ. Res.* **2011**, *26*, 323–335. [[CrossRef](#)] [[PubMed](#)]
90. Maksl, A.; Ashley, S.; Craft, S. Measuring News Media Literacy. *J. Med. Lit. Educ.* **2015**, *6*, 29–45.
91. Martínez-Cerdá, J.F.; Torrent-Sellens, J. Empoderamiento mediático mediante e-learning. Diseño y validación de una escala. *El Profesional de la Información (EPI)* **2017**, *26*, 43–54. [[CrossRef](#)]
92. Norman, C.-D.; Skinner, H.-A. eHEALS: The eHealth Literacy Scale. *J. Med. Internet Res.* **2006**, *8*, e27. [[CrossRef](#)] [[PubMed](#)]
93. Pérez-Rodríguez, M.A.; Delgado-Ponce, Á. De la competencia digital y audiovisual a la competencia mediática: Dimensiones e indicadores. *Comunicar* **2012**, *20*, 25–34. [[CrossRef](#)]
94. Phelps-Tschang, J.; Miller, E.; Rice, K.; Primack, B. Web-based Media Literacy to Prevent Tobacco Use among High School Students. *J. Med. Lit. Educ.* **2016**, *7*, 29–40.
95. Potter, J. The State of Media Literacy. *J. Broadcast. Electron. Med.* **2010**, *54*, 675–696. [[CrossRef](#)]
96. Román-García, S.; Almansa-Martínez, A.; Cruz-Díaz, M.-R. Adults and Elders and their use of ICTs. Media Competence of Digital Immigrants. *Comunicar* **2016**, *24*, 13. [[CrossRef](#)]
97. Vraga, E.; Tully, M.; Kotcher, J.; Smithson, A.-B.; Broeckelman-Post, M. A Multi-Dimensional Approach to Measuring News Media Literacy. *J. Med. Lit. Educ.* **2016**, *7*, 41–53.
98. Zhang, H.; Zhu, C. A Study of Digital Media Literacy of the 5th and 6th Grade Primary Students in Beijing. *Asia-Pacif. Educ. Res.* **2016**, *25*, 579–592. [[CrossRef](#)]
99. Benito-Osorio, D.; Peris-Ortiz, M.; Armengot, C.R.; Colino, A. Web 5.0: The future of emotional competences in higher education. *Glob. Bus. Perspect.* **2013**, *1*, 274–287. [[CrossRef](#)]
100. CEDEFOP. *Skills, Qualifications and Jobs in the EU: The Making of a Perfect Match?* Publications Office of the European Union: Luxembourg, 2015.
101. Corominas Rovira, E.; Saurina Canals, C.; Villar Hoz, E.; AQU. *Adequació de la Formació Universitària al Mercat de Treball Anàlisi de Tres Cohorts de Graduats a Catalunya*; Agència per a la Qualitat del Sistema Universitari de Catalunya (AQU): Barcelona, Spain, 2010.
102. Domitrovich, C.E.; Cortes, R.C.; Greenberg, M.T. Improving Young Children’s Social and Emotional Competence: A Randomized Trial of the Preschool “PATHS” Curriculum. *J. Primary Prev.* **2007**, *28*, 67–91. [[CrossRef](#)] [[PubMed](#)]
103. Foray, D.; Lundvall, B.-Å. The Knowledge-Based Economy: From the Economics of Knowledge to the Learning Economy. In *The Economic Impact of Knowledge*; Butterworth-Heinemann: Boston, MA, USA, 1998; pp. 115–121.
104. Kruger, J.; Blignaut, A.S. Linking Emotional Intelligence to Achieve Technology Enhanced Learning in Higher Education. *Turk. Online J. Dist. Educ.* **2013**, *14*, 99–120.
105. Lundvall, B.Å. The Economics of Knowledge and Learning. In *Product Innovation, Interactive Learning and Economic*; Lundvall, B.-Å., Christensen, J.L., Eds.; Emerald Group Publishing Limited: Amsterdam, The Netherlands, 2004; Volume 8, pp. 21–42.
106. Lundvall, B.Å.; Johnson, B. The Learning Economy. *J. Ind. Stud.* **1994**, *1*, 23–42. [[CrossRef](#)]
107. Mason, J.; Lefrere, P. Trust, Collaboration, e-Learning and Organisational Transformation. *Int. J. Train. Dev.* **2003**, *7*, 259–270. [[CrossRef](#)]
108. Naeve, A.; Yli-Luoma, P.; Kravcik, M.; Lytras, M.D. A modelling approach to study learning processes with a focus on knowledge creation. *Int. J. Technol. Enhanc. Learn.* **2008**, *1*, 1–34. [[CrossRef](#)]
109. OECD. *Employment and Growth in the Knowledge-Based Economy*; OECD Publishing: Copenhagen, Denmark, 1996.
110. OECD. *Knowledge Management in the Learning Society*; OECD Publishing: Paris, France, 2000.
111. OECD. *OECD Skills Outlook 2013: First Results from the Survey of Adult Skills*; OECD Publishing: Paris, France, 2013.
112. Rychen, D.S.; Salganik, L.H. *The Definition and Selection of Key Competencies: Executive Summary*; Organisation for Economic Co-operation and Development (OECD): Neuchâtel, Switzerland, 2005.

113. Torrent-Sellens, J. Knowledge Products and Network Externalities: Implications for the Business Strategy. *J. Knowl. Econ.* **2015**, *6*, 138–156. [[CrossRef](#)]
114. Vratskikh, I.; Masa'deh, R.; Al-Lozi, M.; Maqableh, M. The Impact of Emotional Intelligence on Job Performance via the Mediating Role of Job Satisfaction. *Int. J. Bus. Manag.* **2016**, *11*, 69. [[CrossRef](#)]
115. Anderson, J.R. *The Architecture of Cognition*; Harvard University Press: Cambridge, MA, USA, 1983.
116. Kogut, B.; Zander, U. Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology. *Organ. Sci.* **1992**, *3*, 383–397. [[CrossRef](#)]
117. Martínez-León, I.M.; Ruiz-Mercader, J. Los procesos de creación del conocimiento: El aprendizaje y la espiral de conversión del conocimiento. In *XVI Congreso Nacional y XII Congreso hispano-francés de AEDEM: La empresa intangible*; Universidad de Alicante: San Vicente del Raspeig, Spain, 2002; pp. 1–16.
118. Nonaka, I.; Konno, N. The Concept of “Ba”: Building a Foundation for Knowledge Creation. *Ca. Manag. Rev.* **1998**, *40*, 40–54. [[CrossRef](#)]
119. Nonaka, I.; Takeuchi, H. *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*; Oxford University Press: New York, NY, USA, 1995.
120. Polanyi, M. *Personal Knowledge. Towards a Post-Critical Philosophy*; Routledge: London, UK, 1992.
121. Ryle, G. *The Concept of Mind*; Routledge: New York, NY, USA, 2009.
122. Nonaka, I. The Knowledge-Creating Company. *Harv. Bus. Rev.* **1991**, *69*, 96–104.
123. Nonaka, I. A Dynamic Theory of Organizational Knowledge Creation. *Organ. Sci.* **1994**, *5*, 14–37. [[CrossRef](#)]
124. Andone, D.; Boyne, C.W.; Dron, J.; Pemberton, L. Digital students and their use of e-learning environments. In *Proceedings of the IADIS International Conference WWW/Internet*; IADIS Press: Lisbon, Portugal, 2005; Volume 1, pp. 302–306.
125. Calonge, D.S.; Shah, M.A. MOOCs, Graduate Skills Gaps, and Employability: A Qualitative Systematic Review of the Literature. *Int. Rev. Res. Open Distrib. Learn.* **2016**, *17*. [[CrossRef](#)]
126. Capsada Munsech, Q.; Prades Nebot, A.; AQU. *Ocupabilitat i Competències dels Graduats Recents: L'opinió D'empreses i Institucions. Principals Resultats de L'estudi D'ocupadors 2014*; Agència per la Qualitat del Sistema Universitaria de Catalunya (AQU): Barcelona, Spain, 2015.
127. Garrido, M.; Sullivan, J.; Gordon, A. Understanding the Links Between ICT Skills Training and Employability: An Analytical Framework. *Inf. Technol. Int. Dev.* **2012**, *8*, 17–32.
128. Lupiañez, F.; Codagnone, C.; Dalet, R. *ICT for the Employability and Integration of Immigrants in the European Union: Results from a Survey in Three Member States*; (EUR—Scientific and Technical Research Reports No. EUR 27352 EN); Publications Office of the European Union: Luxembourg, 2015.
129. Papadopoulos, T.; Armatas, C. Evaluation of an ICT Skills Program: Enhancing Graduate Capabilities and Employability. *Int. J. Electron. Commer. Stud.* **2013**, *4*, 93–101. [[CrossRef](#)]
130. Peng, G. Do computer skills affect worker employment? An empirical study from CPS surveys. *Comput. Hum. Behav.* **2017**, *74*, 26–34. [[CrossRef](#)]
131. Van Laar, E.; van Deursen, A.J.A.M.; van Dijk, J.A.G.M.; de Haan, J. The relation between 21st-century skills and digital skills: A systematic literature review. *Comput. Hum. Behav.* **2017**, *72*, 577–588. [[CrossRef](#)]
132. Torrent-Sellens, J.; Fitó-Bertran, À.; Castillo-Merino, D.; Jiménez-Zarco, A.I.; Ficapal-Cusí, P.; Lamolla-Kristiansen, L.; Soler-Ramos, I. *Emprendre en Temps de Crisi: Cap a les Noves Xarxes de Generació de Valor*; Editorial UOC: Barcelona, Spain, 2012.
133. Blades, R.; Fauth, R.; Gibb, J. *Measuring Employability Skills: A Rapid Review to Inform Development of Tools for Project Evaluation*; National Childrens Bureau: London, UK, 2012.
134. Judge, T.A.; Erez, A.; Bono, J.E.; Thoresen, C.J. Are Measures of Self-esteem, Neuroticism, Locus of Control, and Generalized Self-efficacy Indicators of a Common Core Construct? *J. Pers. Soc. Psychol.* **2002**, *83*, 693–710. [[CrossRef](#)] [[PubMed](#)]
135. Menon, S.T. Employee Empowerment: An Integrative Psychological Approach. *Appl. Psychol.* **2001**, *50*, 153–180. [[CrossRef](#)]
136. National Research Council. *Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century*; Pellegrino, J.W., Hilton, M.L., Eds.; The National Academies Press: Washington, DC, USA, 2012.
137. San-Millán, N.; Mazzucchelli, P.C. De la reflexión a la acción. Relato de la experiencia RoadsMOOC, como viaje educativo de transformación personal y social. *Rev. Mediterr. Commun.* **2016**, *7*, 81–97. [[CrossRef](#)]
138. Spreitzer, G.M. Psychological Empowerment in the Workplace: Dimensions, Measurement, and Validation. *Acad. Manag. J.* **1995**, *38*, 1442–1465. [[CrossRef](#)]

139. Yizhong, X.; Lin, Z.; Baranchenko, Y.; Lau, C.K.; Yukhanaev, A.; Lu, H. Employability and job search behavior: A six-wave longitudinal study of Chinese university graduates. *Empl. Relat.* **2017**, *39*, 223–239. [[CrossRef](#)]
140. Zimmerman, M.A. Psychological Empowerment: Issues and Illustrations. *Am. J. Community Psychol.* **1995**, *23*, 581–599. [[CrossRef](#)] [[PubMed](#)]
141. Fugate, M.; Kinicki, A.J.; Ashforth, B.E. Employability: A psycho-social construct, its dimensions, and applications. *J. Vocat. Behav.* **2004**, *65*, 14–38. [[CrossRef](#)]
142. Fugate, M.; Kinicki, A.J. A dispositional approach to employability: Development of a measure and test of implications for employee reactions to organizational change. *J. Occup. Organ. Psychol.* **2008**, *81*, 503–527. [[CrossRef](#)]
143. Fugate, M. Employability. In *Encyclopedia of Career Development*; Greenhaus, J.H., Callanan, G.A., Eds.; Sage Publications: Thousand Oaks, CA, USA, 2006; Volume 1, pp. 267–271.
144. Hennekam, S. Employability of older workers in the Netherlands: Antecedents and consequences. *Int. J. Manpow.* **2015**, *36*, 931–946. [[CrossRef](#)]
145. Lo Presti, A.; Pluviano, S. Looking for a route in turbulent waters: Employability as a compass for career success. *Organ. Psychol. Rev.* **2016**, *6*, 192–211. [[CrossRef](#)]
146. Maslić Seršić, D.; Tomas, J. The Role of Dispositional Employability in Determining Individual Differences in Career Success. *Drus. Istraz.* **2014**, *23*, 593–613. [[CrossRef](#)]
147. Pinto, L.H.; Ramalheira, D.C. Perceived employability of business graduates: The effect of academic performance and extracurricular activities. *J. Vocat. Behav.* **2017**, *99*, 165–178. [[CrossRef](#)]
148. Torrent-Sellens, J.; Ficapal-Cusí, P.; Boada-Grau, J. Dispositional Employability and Online Training Purchase. Evidence from Employees' Behavior in Spain. *Front. Psychol.* **2016**, *7*, 1–15. [[CrossRef](#)] [[PubMed](#)]
149. Van der Heijde, C.M. Employability and Self-Regulation in Contemporary Careers. In *Psycho-Social Career Meta-Capacities*; Coetzee, M., Ed.; Springer International Publishing: Cham, Switzerland, 2014; pp. 7–17.
150. Vanhercke, D.; Cuyper, N.D.; Peeters, E.; Witte, H.D. Defining perceived employability: A psychological approach. *Pers. Rev.* **2014**, *43*, 592–605. [[CrossRef](#)]
151. Jovanovic, B. Job Matching and the Theory of Turnover. *J. Political Econ.* **1979**, *87*, 972. [[CrossRef](#)]
152. Neal, D. The Complexity of Job Mobility among Young Men. *J. Labor Econ.* **1999**, *17*, 237–261. [[CrossRef](#)]
153. Stevens, M. Earnings Functions, Specific Human Capital, and Job Matching: Tenure Bias Is Negative. *J. Labor Econ.* **2003**, *21*, 783–805. [[CrossRef](#)]
154. Zaretsky, A.M.; Coughlin, C.C. An introduction to the theory and estimation of a job-search model. *Rev. Fed. Reserv. Bank St. Louis* **1995**, *77*, 53.
155. The Gallup Organization. *Employers' Perception of Graduate Employability*; European Commission: Budapest, Hungary, 2010.
156. Winterbotham, M.; Vivian, D.; Shury, J.; Davies, B.; Kik, G. *The UK Commission's Employer Skills Survey 2013: UK Results*; Commission for Employment and Skills: London, UK, 2014.
157. Baay, P.E.; de Ridder, D.T.D.; Eccles, J.S.; van der Lippe, T.; van Aken, M.A.G. Self-control trumps work motivation in predicting job search behavior. *J. Vocat. Behav.* **2014**, *85*, 443–451. [[CrossRef](#)]
158. Lee, S.; Song, Y.; Jeong, M.; Lee, C.; Yun, G. Differences in the Influence of College Students' Self-Esteem for Getting-a-Job on Job Search Behavior Intensity in South Korea. *Indian J. Sci. Technol.* **2016**, *9*. [[CrossRef](#)]
159. Onyishi, I.E.; Enwereuzor, I.K.; Ituma, A.N.; Omenma, J.T. The mediating role of perceived employability in the relationship between core self-evaluations and job search behaviour. *Career Dev. Int.* **2015**, *20*, 604–626. [[CrossRef](#)]
160. Calzada, I. *Futuro del Trabajo. Trabajo del Futuro*; MIK: Arrasate, Gipuzkoa, 2005.
161. Castells, M. Materials for an exploratory theory of the network society. *Br. J. Sociol.* **2000**, *51*, 5–24. [[CrossRef](#)]
162. Drucker, P.F. *The Landmarks of Tomorrow*; Harper & Brothers: New York, NY, USA, 1959.
163. Drucker, P.F. *The Age of Discontinuity: Guidelines to Our Changing Society*; William Heinemann Ltd.: London, UK, 1969.
164. Leadbeater, C. *Living on Thin Air: The New Economy*; Viking: London, UK, 1999.
165. Torres Díaz, J.C.; Torres Carrión, P.V.; Infante Moro, A. Mobile learning: Perspectives. *RUSC Univ. Knowl. Soc. J.* **2015**, *12*, 38–49. [[CrossRef](#)]
166. Webster, F. *Theories of the Information Society*, 4th ed.; Routledge: New York, NY, USA, 2014.
167. Bell, D. *The Coming of Post-Industrial Society. A Venture in Social Forecasting*; Basic Books: New York, NY, USA, 1999.

168. Bollier, D. *The Future of Work: What it Means for Individuals, Businesses, Markets and Governments*; The Aspen Institute: Washington, DC, USA, 2011.
169. Castells, M. The Network Enterprise: The Culture, Institutions, and Organizations of the Informational Economy. In *The Rise of the Network Society*; Wiley-Blackwell: Hoboken, NJ, USA, 2009; pp. 163–215.
170. Drucker, P.F. *Post-Capitalist Society*; Routledge: New York, NY, USA, 1993.
171. Farnsworth, V.; Kleanthous, I.; Wenger-Trayner, E. Communities of Practice as a Social Theory of Learning: A Conversation with Etienne Wenger. *Br. J. Educ. Stud.* **2016**, *64*, 139–160. [[CrossRef](#)]
172. Grantham, C.E. Design Principles for the Virtual Workplace. In *Proceedings of the ACM SIGCPR/SIGMIS Conference on Computer Personnel Research*; ACM: New York, NY, USA, 1996.
173. Inkpen, A.C.; Tsang, E.W.K. Social Capital, Networks, and Knowledge Transfer. *Acad. Manag. Rev.* **2005**, *30*, 146–165. [[CrossRef](#)]
174. Malone, T.W.; Laubacher, R.; Scott Morton, M.S. *Inventing the Organizations of the 21st Century*; MIT Press: Cambridge, MA, USA, 2003.
175. McDermott, R.; O'Dell, C. Overcoming cultural barriers to sharing knowledge. *J. Knowl. Manag.* **2001**, *5*, 76–85. [[CrossRef](#)]
176. Ware, J.; Grantham, C. The future of work: Changing patterns of workforce management and their impact on the workplace. *J. Facil. Manag.* **2003**, *2*, 142–159. [[CrossRef](#)]
177. Alemán, J. Labour market dualism and industrial relations in Europe. *Ind. Relat. J.* **2009**, *40*, 252–272. [[CrossRef](#)]
178. Botero, J.C.; Djankov, S.; La Porta, R.; Lopez-De-Silanes, F.; Shleifer, A. The Regulation of Labor. *Quart. J. Econ.* **2004**, *119*, 1339–1382. [[CrossRef](#)]
179. Ficapal-Cusí, P.; Torrent-Sellens, J. New Human Resource Management Systems in Non-Based-Knowledge Firms: Applications for Decision Making on the Business Performance. *Mod. Econ.* **2014**, *5*, 139–151. [[CrossRef](#)]
180. Kalleberg, A.L. Nonstandard Employment Relations: Part-time, Temporary, and Contract Work. *Annu. Rev. Sociol.* **2010**, *26*, 341–365. [[CrossRef](#)]
181. Morgan, J.; Genre, V.; Wilson, C. Measuring Employment Security in Europe Using Surveys of Employers. *Ind. Relat.* **2001**, *40*, 54–72. [[CrossRef](#)]
182. Tilly, C. Reasons for the Continuing Growth of Part-Time Employment. *Mon. Labor Rev.* **1991**, *114*, 10.
183. Rust, J.; Golombok, S. *Modern Psychometrics: The Science of Psychological Assessment*; Routledge: London, UK; New York, NY, USA, 1999.
184. Head, A.J. *Staying Smart: How Today's Graduates Continue to Learn Once They Complete College*; Social Science Research Network: New York, NY, USA, 2016.
185. Wotherspoon, S.E.; McCarthy, P.W. The Factors and Motivations behind United Kingdom Chiropractic Professional Association Membership: A Survey of the Welsh Institute of Chiropractic Alumni. *Chiropr. Man. Ther.* **2016**, *24*, 1–9. [[CrossRef](#)] [[PubMed](#)]
186. R Core Team. *R: A Language and Environment for Statistical Computing*; R Foundation for Statistical Computing: Vienna, Austria, 1996.
187. Rosseel, Y. Lavaan: An R Package for Structural Equation Modeling. *J. Stat. Softw.* **2012**, *48*, 1–36. [[CrossRef](#)]
188. Bi, R.; Davison, R.M.; Kam, B.; Smyrnios, K.X. Developing Organizational Agility through It and Supply Chain Capability. In *PACIS 2012 Proceedings*; AIS Electronic Library (AISeL): Hochiminh City, Vietnam, 2012; p. 64.
189. Yang, Z.; Sun, J.; Zhang, Y.; Wang, Y. Understanding SaaS adoption from the perspective of organizational users: A tripod readiness model. *Comput. Hum. Behav.* **2015**, *45*, 254–264. [[CrossRef](#)]
190. Bollen, K.; Lennox, R. Conventional wisdom on measurement: A structural equation perspective. *Psychol. Bull.* **1991**, *110*, 305–314. [[CrossRef](#)]
191. Guadagnoli, E.; Velicer, W.F. Relation of Sample Size to the Stability of Component Patterns. *Psychol. Bull.* **1988**, *103*, 265–275. [[CrossRef](#)] [[PubMed](#)]
192. Muthén, L.K.; Muthén, B.O. How to Use a Monte Carlo Study to Decide on Sample Size and Determine Power. *Struct. Equ. Model.* **2002**, *9*, 599–620. [[CrossRef](#)]
193. Myers, N.D.; Ahn, S.; Jin, Y. Sample Size and Power Estimates for a Confirmatory Factor Analytic Model in Exercise and Sport. *Res. Quart. Exerc. Sport* **2011**, *82*, 412–423. [[CrossRef](#)] [[PubMed](#)]

194. Rouquette, A.; Falissard, B. Sample Size Requirements for the Internal Validation of Psychiatric Scales. *Int. J. Methods Psychiatric Res.* **2011**, *20*, 235–249. [[CrossRef](#)] [[PubMed](#)]
195. Hair, J.F., Jr.; Black, W.C.; Babin, B.J.; Anderson, R.E. *Multivariate Data Analysis*; Pearson Education Limited: Harlow, UK, 2014.
196. Hooper, D.; Coughlan, J.; Mullen, M. Structural equation modelling: Guidelines for determining model fit. *Electron. J. Bus. Res. Methods* **2008**, *6*, 53–60.
197. Barnett, R. *Improving Higher Education: Total Quality Care*; The Society for Research into Higher Education & Open University Press: Buckingham, UK, 1992.
198. Bunge, M. *Ontology II: A World of Systems*; Treatise on Basic Philosophy; D. Reidel Publishing Company: The Netherlands, 1979; Volume 4.
199. Barberà Gregori, E. Proceso de Estudio en Enseñanza Universitaria a Distancia con Uso de Nuevas Tecnologías. *RIED Rev. Iberoam. Educ. Dist.* **2000**, *3*, 9–26. [[CrossRef](#)]
200. De Grip, A.; Sauermann, J. The effect of training on productivity: The transfer of on-the-job training from the perspective of economics. *Educ. Res. Rev.* **2013**, *8*, 28–36. [[CrossRef](#)]
201. Crespo-García, R.M.; Pardo, A.; Delgado Kloos, C.; Niemann, K.; Scheffel, M.; Wolpers, M. Peeking into the black box: Visualising learning activities. *Int. J. Technol. Enhanc. Learn.* **2012**, *4*, 99. [[CrossRef](#)]
202. Fenwick, T.; Edwards, R. Networks of knowledge, matters of learning, and criticality in higher education. *High. Educ.* **2014**, *67*, 35–50. [[CrossRef](#)]
203. Maritz, A.; Brown, C.R. Illuminating the black box of entrepreneurship education programs. *Educ. Train.* **2013**, *55*, 234–252. [[CrossRef](#)]
204. Sabrià-Bernadó, B.; Llinàs-Audet, X.; Isus, S. Determinants of user demand for lifelong learning in institutions of higher education. *Int. J. Train. Dev.* **2017**, *21*, 145–166. [[CrossRef](#)]
205. Dudel, C.; Gómez, M.A.L.; Benavides, F.; Myrskylä, M.A. *Lost Generation? The Financial Crisis and the Length of Working Life in Spain*; Paper WP-2016-010; Max Planck Institute for Demographic Research: Rostock, Germany, 2016.
206. UNESCO. *International Standard Classification of Education (ISCED) 2011*; UNESCO Institute for Statistics: Montreal, QC, Canada, 2012.
207. Gonzalez, H.B.; Kuenzi, J.J. *Science, Technology, Engineering, and Mathematics (STEM) Education: A Primer*; Paper R42642; Congressional Research Service: Washington, DC, USA, 2012.
208. Dries, N.; Pepermans, R.; Carlier, O. Career success: Constructing a multidimensional model. *J. Vocat. Behav.* **2008**, *73*, 254–267. [[CrossRef](#)]
209. Gerber, M.; Wittekind, A.; Grote, G.; Staffelbach, B. Exploring types of career orientation: A latent class analysis approach. *J. Vocat. Behav.* **2009**, *75*, 303–318. [[CrossRef](#)]
210. Huang, Q.; Sverke, M. Women’s occupational career patterns over 27 years: Relations to family of origin, life careers, and wellness. *J. Vocat. Behav.* **2007**, *70*, 369–397. [[CrossRef](#)]
211. Lyons, S.T.; Schweitzer, L.; Ng, E.S.W. How have careers changed? An investigation of changing career patterns across four generations. *J. Manag. Psychol.* **2015**, *30*, 8–21. [[CrossRef](#)]
212. Vinkenburg, C.J.; Weber, T. Managerial career patterns: A review of the empirical evidence. *J. Vocat. Behav.* **2012**, *80*, 592–607. [[CrossRef](#)]
213. Brinkley, I. *Defining the Knowledge Economy*; Knowledge Economy Programme Report; The Work Foundation: London, UK, 2006.
214. Greene, C.; Myerson, J. Space for thought: Designing for knowledge workers. *Facilities* **2011**, *29*, 19–30. [[CrossRef](#)]
215. Pyöriä, P. The concept of knowledge work revisited. *J. Knowl. Manag.* **2005**, *9*, 116–127. [[CrossRef](#)]
216. Kuijpers, M.; Meijers, F.; Gundy, C. The relationship between learning environment and career competencies of students in vocational education. *J. Vocat. Behav.* **2011**, *78*, 21–30. [[CrossRef](#)]
217. Putnam, R.D. *Bowling Alone: The Collapse and Revival of American Community*; Simon and Schuster: New York, NY, USA, 2000.
218. Jarvis, P. *International Dictionary of Adult and Continuing Education*; Kogan Page: London, UK, 2005.
219. Barrie, S.C. A research-based approach to generic graduate attributes policy. *High. Educ. Res. Dev.* **2004**, *23*, 261–275. [[CrossRef](#)]
220. Halfhill, T.R.; Nielsen, T.M. Quantifying the “Softer Side” of Management Education: An Example Using Teamwork Competencies. *J. Manag. Educ.* **2007**, *31*, 64–80. [[CrossRef](#)]

221. Edwards, J.R.; Bagozzi, R.P. On the nature and direction of relationships between constructs and measures. *Psychol. Methods* **2000**, *5*, 155–174. [[CrossRef](#)] [[PubMed](#)]
222. Folloni, G.; Vittadini, G. Human Capital Measurement: A Survey. *J. Econ. Surv.* **2010**, *24*, 248–279. [[CrossRef](#)]
223. Smith, E.E.; Krüger, J. A critical assessment of the perceptions of graduates regarding their generic skills level: An exploratory study. *S. Afr. J. Econ. Manag. Sci.* **2011**, *11*, 121–138. [[CrossRef](#)]
224. Melamed, A. *El futuro del trabajo, el trabajo del future*; Buenos Aires: Libronauta Argentina, 2005.
225. Jarvis, P. *Democracy, Lifelong Learning and the Learning Society. Active Citizenship in a Late Modern Age*; Routledge: New York, NY, USA, 2008.
226. Wright, K.-B. Researching Internet-Based Populations: Advantages and Disadvantages of Online Survey Research, Online Questionnaire Authoring Software Packages, and Web Survey Services. *J. Comput.-Mediat. Commun.* **2005**, *10*. [[CrossRef](#)]
227. Jackson, D. Re-conceptualising graduate employability: The importance of pre-professional identity. *High. Educ. Res. Dev.* **2016**, *35*, 925–939. [[CrossRef](#)]
228. Abderrazek, W. Some Cultural Issues in the Adoption of E-Learning. A Structuration Theory Approach. In *E-Learning 2.0 Technologies and Web Applications in Higher Education*; Pelet, J.-E., Ed.; IGI Global: Hershey, PA, USA, 2014; pp. 238–253.
229. Rousseau, D.M. Technological differences in job characteristics, employee satisfaction, and motivation: A synthesis of job design research and sociotechnical systems theory. *Organ. Behav. Hum. Perform.* **1977**, *19*, 18–42. [[CrossRef](#)]
230. McQuaid, R.W.; Lindsay, C. The Concept of Employability. *Urban Stud.* **2005**, *42*, 197–219. [[CrossRef](#)]
231. Green, A.E.; de Hoyos, M.; Barnes, S.-A.; Owen, D.; Baldauf, B.; Behle, H.; Institute for Prospective Technological Studies. *Literature Review on Employability, Inclusion and ICT, Report 1: The Concept of Employability with a Specific Focus on Young People, Older Workers and Migrants*; Publications Office of the European Union: Luxembourg, 2013.
232. Gazier, B. Employability: Concepts and Policies. *InforMISEP Policies* **1999**, *67/68*, 36–47.
233. Suárez-Lantarón, B. Empleabilidad: Análisis del concepto. *Rev. Investig. Educ.* **2016**, *14*, 67–84.
234. Jackson, D. Testing a model of undergraduate competence in employability skills and its implications for stakeholders. *J. Educ. Work* **2014**, *27*, 220–242. [[CrossRef](#)]
235. Tamkin, P.; Hillage, J. *Employability and Employers: The Missing Piece of the Jigsaw*; The Institute for Employment Studies: Brighton, UK, 1999.



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