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The Development and Preliminary Validation of the Coyre Competencies for Employment Scale (CCES)

Abstract: Past authors produced a framework to outline the core competencies needed for employment in the 21st-century workforce. However, this framework was not implemented for developing personalised educational plans to nurture competencies in students. This study developed and validated the Core Competencies for Employment Scale (CCES) to identify core competencies that final-year students should develop to become employable in the 21st century. The sample included 521 final-year undergraduate students, who assessed their possession of 24 core competencies and their perceptions of how employers value them. Differences in scores in these two assessments helped gauge the areas of core competencies improvement. Exploratory factor analysis grouped the 24 competencies into four factors: Skills, Capacity for Change, General Literacy, and Digital Literacy. The four-factor structure was confirmed. The study concluded that the CCES can help educators identify core competencies that students should develop before employment.

Keywords: core competencies, 21st-century workforce, employability, personalised educational plans, competency-focused education

Introduction

In today's fast-paced and ever-changing world, the concept of competencies has gained particular importance. Competencies are a bridge that connects the realm of education with the demands of the job market (Lilia & Elena, 2019). They are tangible skills and qualities that students bring to potential employers and are core to improving their career opportunities, job performance, and personal and professional growth (Teijeiro et al., 2013). Competencies are crucial, as shown by

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the fact that the main mission of the Organization for Economic Cooperation and Development (OECD, 2023a) is to help governments enable young people to acquire the skills necessary for future employment. The OECD (2023a) recognises that nurturing the right competencies is critical to achieving this goal. The OECD (2023b) supports research on identifying the most important competencies for the 21st century, and many other research endeavours aim to determine the core competencies that enhance the employability of final-year students (Burrus et al., 2013; Finegold & Notabartolo, 2008).

Despite the abundance of literature on competencies, there is no universally accepted definition of this construct. Most competencies are subject to varying interpretations because they lack a well-defined operationalisation and are not clearly linked to specific actions (Shavelson, 2010). Operationalisation is challenging because the concept of competencies is a hypothetical construct, an abstract idea that cannot be directly observed (Lilia & Elena, 2019). On the other hand, students' competencies are closely linked to their employability (Teijeiro et al., 2013) and performance in subsequent careers (Akkermans & Tims, 2017), meaning that they are a highly significant term with concrete implications for educational and professional practice.

The most prominent definition of competencies equates them to "a set of knowledge, skills, and attitudes that enable a person to perform tasks at a specific job" (McClelland, 1998, p.2). Although useful, this definition does not capture the broader applicability of competencies across employment settings. According to the OECD Program Definition and Selection of Competencies (DeSeCo), competencies are more than just knowledge and skills necessary for a particular job. They encompass the ability to face complex demands by activating psychosocial resources, including knowledge and skills, in a wide variety of contexts (Rychen & Salganik, 2003). This definition is dynamic as it highlights the dynamic nature of competencies by emphasising their adaptability across work contexts.

The most useful conceptualisation of competencies derives from the literature on 'core competencies'. Core competencies are a set of fundamental skills, knowledge, and attributes that are not tied to a specific subject or area but are desirable regardless of a person's discipline or chosen profession (Rieckmann, 2012). These competencies are a foundation for developing more specialised competencies and are valued across contexts (Kuijpers & Meijers, 2011). In the setting of post-graduation employment, core competencies assist students in building a skillset that can be applied to various pro fessional roles, enabling them to adapt to different work situations (Espinoza & Ukleja, 2016). For this reason, it is

commonly suggested that students should be educated in a way that equips them with core competencies that would allow them to navigate through subsequent careers regardless of their career choice (Rieckmann, 2012). Core competencies are particularly important in the 21st century as they help final-year students excel in working environments that are characterised by complex challenges, rapid technological advancements, and changing job landscapes, which require significant adaptation and transferability of skills (Burrus et al., 2013).

Given the essentiality of core competencies for the students' employment and subsequent careers, it is crucial to recognise which competencies are needed for students' success in the 21st-century workforce. This recognition can aid the planning of competency-focused education, the development of methods for assessing competencies, and the alignment of educational programmes to the needs of the labour market (Boahin & Hofman, 2014). The most comprehensive research into the classification of core competencies has so far been conducted by Burrus et al. (2013), who based their classification on three frameworks: Finegold and Notabartolo's (2008) framework, the Assessment and Teaching of the 21st Century Skills (ACTS21) framework, and the Partnership for 21st Century Skills (P21) framework.

The first framework arose from an examination of the literature on the requirements for future jobs (Finegold & Notabartolo, 2008). It identified the following five groups of competencies needed for students' employment success regardless of their background: Analytical Skills, Interpersonal Skills, Ability to Execute, Information Processing, and Capacity for Change. The ATC21S framework developed a list of core competencies by having industry experts examine worldwide curricula designed for developing 21st-century skills in final-year students (Binkley et al., 2012). It recognised the essentiality of the following groups of competencies: Ways of Thinking, Ways of Working, Tools for Working, and Living in the World. The P21 framework was developed via the input of experts from Microsoft, the US Department of Education, and other companies and institutions, and it listed the following competencies groups: Core Topics and Themes of the 21st Century, Learning and Innovation Skills, Information, Media, and Technology Skills, and Life and Career Skills (Partnership for 21st Century Skills, 2012). By analysing these three frameworks, Burrus et al. (2013) concluded that 24 competencies can be grouped into five categories of the Finegold and Notabartolo's (2008) framework, with the exclusion of the Living in the World category from the ATC21S framework and the Core Topics and Themes of the 21st Century category from the P21 framework. This yielded seven categories, which are illustrated in Table 1.

Table 1. Core competencies identified across three frameworks (taken from Burrus et al., 2013)

Categories	Competencies	Finegold & Notabartolo (2008)	ATC21S	P21
Analytical skills	Critical thinking	X	X	X
	Problem-solving	X	X	X
	Decision-making	X	X	
	Research and inquiry	X		
Interpersonal skills	Communication	X	X	X
	Collaboration	X	X	X
	Leadership and responsibility	X		X
Ability to execute	Initiative and self-direction	X		
	Productivity	X		
Information processing	Information literacy	X	X	X
	Media literacy	X	X	X
	Digital citizenship	X		
	ICT operations and concepts	X		
Capacity for change	Creativity/innovation	X	X	X
	Adaptive learning	X	X	
	Flexibility	X		
Core topics and themes of the 21st century	Knowledge of core academic topics			X
	Global awareness			X
	Financial, business, and entrepreneurial literacy			X
	Health literacy			X
	Environmental literacy			X
Living in a culture	Citizenship/civic literacy		X	X
	Life and career		X	X
	Personal and social responsibility		X	

Although Burrus et al. (2013) provided a valuable framework for classifying 21st –century workforce competencies, none of the researchers implemented the framework to explore how to help students develop these competencies for success in future jobs. The literature recognises the necessity of identifying a gap between the final-year students' core competencies and competencies needed for employment since such identification could aid the development of education programmes that would improve students' employability (Rieckmann, 2012). The literature also emphasises the importance of developing personalised educational plans, as opposed to one-size-fits-all educational plans, that would assist students in this regard (Fariani et al., 2023). Personalised educational plans are customised and specifically tailored educational strategies designed to meet the

unique employability needs of individual students (Keppell, 2014). Having such plans readily available would be instrumental in fostering the final-year students' readiness for a diverse and dynamic job market.

Lack of methods for assessing the areas of improvement in students' core competencies is the main reason why the framework of 21st-century competencies has not informed the development of personalised educational plans . Even though Burrus et al. (2013) developed a core competencies framework based on past literature, they did not transform this framework into a valid and reliable measure that could gauge the competencies that final-year students need to cultivate before employment. To address this research gap, this study aimed to develop and validate a measure based on Burrus et al.'s (2013) framework. The measure, named the Core Competencies for Employment Scale (CCES), sought to pinpoint discrepancies between the final-year students' core competencies and their perceived relevance for employment. This gap was hoped to inform the development of personalised educational plans for the improvement of core competencies. The study evaluated the CCES' factor structure, content validity, reliability, and usefulness for the development of personalised educational plans during its development and validation.

Method

Sample

The sample comprised 521 students who were completing their final year of undergraduate studies. Out of them, 288 (55.3%) were female, and 232 (44.7%) were male. Their mean age was 22.4 (SD = 2.81). Students were recruited across seven universities, with 332 (63.7%) studying in Belgrade and 189 (36.3%) in Skopje.

Scale Development

The content of the CCES was drawn from the framework of core competencies for the 21st –century workforce developed by Burrus et al. (2013) based on the research by Binkley et al. (2012), Finegold and Notabartolo (2008), and Partnership for 21st Century Skills (2012). The framework identified 24 core competencies, which were grouped into seven categories (see Table 1). In the CCES, students were presented with these 24 competencies and asked to estimate the extent to which they have developed them during their studies. The rating scale ranged

from 1 (*not at all*) to 7 (*completely*). Following this, students were again presented with the list of 24 competencies and were required to rate the degree to which they believe employers considered them important, again on a 1–7 rating scale. The first measure was labelled as 'self-assessment of core competencies' and the second 'the perception of required core competencies'. The difference between the scores on the first and second measures was calculated to capture the areas in which the students need to develop their competencies.

Procedure

The sample size was determined by the number of students who completed the scale within eight weeks. Participation unfolded online. The participants were informed that the study explored their evaluation of competencies needed for employment. They first evaluated their possession of core competencies and then gauged their perceptions of the extent to which employers consider these competencies important. Definitions for all core competencies were provided to assist the participants in evaluating them fully. For instance, *adaptive learning* was defined as "the ability to acquire and apply new knowledge and skills by continuously adjusting one's learning method and strategies" (Finegold & Notabartolo, 2008, p.23), and health literacy as "the ability to access, and evaluate, and effectively utilise health-related information and services to make informed decisions" (Partnership for 21st Century Skills, 2012, p.24).

All participation was voluntary and the study adhered to the ethical principles of anonymity, confidentiality, and the right of withdrawal. The universities granted permission for the study.

Results

Factor Analysis

Exploratory factor analysis (EFA) was performed separately for the self-assessment of core competencies and the perception of required competencies for employment. The suitability of data for EFA was evaluated via Keiser-Meyer-Olkin (KMO) values and Bartlett's tests of sphericity (Flora et al., 2012). In the first EFA, KMO was .891 and Bartlett's test of sphericity was significant ($X^2(276) = 1849.33$, $p < .001$), indicating that the data were suitable for analysis. Promax rotation was employed on the items to determine the configuration of

the CCES when measuring the self-assessment of competencies. Cattell's scree test and Horn's parallel analysis indicated the suitability of a three-factor solution.

In combination, the three factors explained 53.38% of the variance. The first factor explained 39.68%, the second factor 7.87%, and the third factor 5.82% of the variance. Factor loadings are shown in Table 2. They suggest a clear distinction in competencies based on their content. The first component included competencies related to social, cognitive, and other skills, and the other two components included competencies related to various forms of literacy. Consequently, the first component was named Skills, the second General Literacy, and the third Literacy in the Digital Age or simply Digital Literacy. Skills seem to encompass competencies developed through practice, while literacy denotes the acquisition of knowledge and its practical application.

Table 2. Results of EFA for the self-assessment of core competencies grouped into three factors

Competencies	F1	F2	F3	Com
Leadership and responsibility	.79			.62
Decision-making	.73			.53
Critical thinking	.72			.52
Problem-solving	.71			.50
Collaboration	.70			.49
Initiative and self-direction	.67			.45
Research and inquiry	.67			.45
Communication	.67			.45
Productivity	.59		.35	.34
Flexibility	.50			.25
Adaptive learning		.45		.24
Environmental literacy		.82		.67
Financial, business, and entrepreneurial literacy		.81		.66
Health literacy		.81		.66
Global awareness		.80		.64
Citizenship/civic literacy		.68		.46
Personal and social responsibility		.61		.37
Knowledge of core academic topics		.49		.24
Life and career		.48		.23
Creativity/innovation		.35		.12
ICT operations and concepts			.89	.79
Information literacy			.84	.71
Digital citizenship			.80	.64
Media literacy			.72	.52

The EFA was repeated to determine the factor structure of the CCES when measuring the students' perceptions of required competencies for employment. The data were suitable for factor analysis, as indicated by the KMO value of .904 and the significance of Bartlett's test of sphericity ($X^2(276) = 1911.62$, $p < .001$). Like in the previous analysis, Promax rotation was employed. Cattell's scree test suggested the suitability of a three– or a four-factor solution. However, as Horn's parallel analysis recommended retaining three factors, three factors were extracted.

Taken together, the three factors accounted for 58.62% of the variance, with the first factor explaining 41.92%, the second 10.94%, and the third 5.77% of the variance. Table 3 shows factor loadings in this analysis, indicating a differentiation in competencies based on their content. As in the previous EFA, the isolated factors were Skills, General Literacy, and Digital Literacy. There were differences in how strongly some competencies loaded onto different factors and in the factors onto which they have loaded. Thus, f*lexibility* loaded to a similar degree onto the Skills and Digital Literacy factors, and *citizenship/civic literacy* loaded similarly onto the General Literacy and Digital Literacy factors. *Adaptive learning* loaded onto Digital Literacy instead of the Skills factor, and *creativity/innovation* loaded onto Skills instead of the Digital Literacy factor.

Table 3. Results of EFA for the assessment of required competencies for employment grouped into three factors

Competencies	F1	F2	F3	Com
Decision-making	.93		-.35	.86
Problem-solving	.86			.74
Critical thinking	.75			.56
Communication	.75			.56
Collaboration	.71			.50
Leadership and responsibility	.69			.48
Productivity	.61		.34	.37
Research and inquiry	.56	.30		.32
Initiative and self-direction	.55			.30
Creativity/innovation	.40			.16
Environmental literacy		.89		.79
Health literacy		.89		.79
Global awareness		.84		.71
Knowledge of core academic topics		.76		.58
Personal and social responsibility		.62		.38
Life and career		.62		.38
Citizenship/civic literacy		.57	.51	.32

Competencies	F1	F2	F3	Com
Financial, business, and entrepreneurial literacy		.47	.32	.22
Adaptive learning		.45		.22
ICT operations and concepts			.89	.79
Digital citizenship			.83	.69
Information literacy			.75	.56
Media literacy			.32	.58	.34
Flexibility	.33		.35	.13

Since competencies in Finegold and Notabartolo's (2008) category Capacity for Change change factors and/or factor loadings when measuring self-assessment of personal competencies and the perception of required competencies, it seemed reasonable to attempt to extract four factors in both measures. This attempt was first completed for the self-assessment of core competencies. The four factors altogether accounted for 68.12% of the variance. The first factor explained 43.29%, the second 11.54%, the third 8.02%, and the fourth 5.27% of the variance. Table 4 displays factor loadings in this analysis. There was a clear grouping of competencies into four factors, which can now be labelled as Skills, Capacity for Change, General Literacy, and Digital Literacy.

Table 4. Results of EFA for the self-assessment of core competencies grouped into four factors

Competencies	F1	F2	F3	F4	Com
Leadership and responsibility	.81				.66
Decision-making	.77				.59
Critical thinking	.75				.56
Problem-solving	.71				.50
Collaboration	.70				.49
Initiative and self-direction	.69				.48
Research and inquiry	.69				.48
Communication	.62				.38
Productivity	.55			.31	.30
Flexibility		.73			.53
Adaptive learning		.68			.46
Creativity/innovation		.54			.29
Environmental literacy			.84		.71
Financial, business, and entrepreneurial literacy			.83		.69
Health literacy			.83		.69
Global awareness			.82		.67
Citizenship/civic literacy			.71		.50
Knowledge of core academic topics			.67		.45

Competencies	F1	F2	F3	F4	Com
Personal and social responsibility			.55		.30
Life and career			.51	.32	.26
ICT operations and concepts				.88	.77
Information literacy				.83	.69
Digital citizenship				.82	.67
Media literacy				.74	.54

The analysis was repeated for the perception of the required competencies. The four factors explained a total of 64.21% of the variance, with the first factor explaining 40.12%, the second 10.23%, the third 8.62%, and the fourth 5.24% of the variance. The obtained factor loadings are summarised in Table 5. As was the case in the previous EFA, the competencies loaded almost ideally onto the Skills, Capacity for Change, General Literacy, and Digital Literacy factors. The four-factor solution appeared the best fit for the data as there were no pronounced inconsistencies in how competencies were grouped into factors in this EFA and the previous one.

Table 5. Results of EFA for the assessment of required competencies for employment grouped into four factors

Competencies	F1	F2	F3	F4	Com
Decision-making	.94				.88
Problem-solving	.88				.77
Communication	.77				.59
Critical thinking	.75				.56
Collaboration	.73				.53
Leadership and responsibility	.70				.49
Productivity	.65		.33		.42
Initiative and self-direction	.60				.36
Research and inquiry	.58				.34
Creativity/innovation		.69			.48
Adaptive learning		.66			.44
Flexibility		.62			.38
Environmental literacy			.89		.79
Health literacy			.87		.76
Global awareness			.86		.74
Knowledge of core academic topics			.78		.61
Life and career			.65		.42
Personal and social responsibility			.64		.41
Citizenship/civic literacy			.59	.30	.35
Financial, business, and entrepreneurial literacy			.56		.32

Competencies	F1	F2	F3	F4	Com
ICT operations and concepts				.91	.66
Digital citizenship				.84	.71
Information literacy				.76	.58
Media literacy				.60	.36

A confirmatory factor analysis (CFA) was performed in SPSS AMOS to try to confirm the four-factor structure. The analysis done on the measure assessing the self-assessment of core competencies yielded the following parameters: $x2$ = 517.4, p <.001, goodness of fit (GFI) = .92, adjusted goodness of fit (AGFI) = .91, CFI = .91, standard root mean square residual (SRMR) = .05, and root mean square error of approximation (RMSEA) = .07. All these parameters were in the expected range (Kline, 2016), indicating the adequacy of the model fit. The obtained parameters on the measure assessing the perceptions of required competencies were: $x2$ = 498.7, p <.001, GFI = .91, AGFI = .90, CFI = .83, SRMR = .07, and RMSEA = .06. Only the CFI was smaller than its cut-off value (i.e.,> .90), although not much. Considering these findings, the four-factor model appeared appropriate for capturing both the students' self-assessment of core competencies and perceptions of required competencies for employment.

Reliability Analysis

Internal consistency was evaluated for the self-assessment of core competencies and of perceptions of required competencies separately. Cronbach's alphas for the whole measures were .85 and .84, indicating good internal consistency. Skills factor had excellent (Cronbach's alphas = .91 and .92, respectively), Capacity for Change acceptable (Cronbach's alphas = .78 and .75, respectively), General Literacy good (Cronbach's alphas = .82 and .83, respectively), and Digital Literacy good internal consistency (Cronbach's alphas = .88 and .86, respectively).

Descriptive Analysis

A descriptive analysis was performed to gauge the usability of the CCES to identify the students' most and least developed competencies, their perceptions of the most and least important competencies from the employers' perspectives, and areas for improvement of their competencies. On average, the students evaluated their Skills competencies as the most developed and their Digital Literacy competencies as the least developed. Similarly, they thought that employers valued

the Skills competencies the most and the Digital Literacy competencies the least. An inspection of the differences in scores on the two measures offered insights into the areas of the students' competencies development needs. The greatest differences or discrepancies were observed for Skills competencies. The highest difference scores were identified for the following skills: *problem-solving*, *research and inquiry*, *communication*, *decision-making*, *productivity*, and *leadership and responsibility*. Although, Capacity for Change, General Literacy, and Digital Literacy categories obtained lower difference scores in comparison, some individual competencies did have relatively high difference scores (> .50). They included *creativity/innovation* in the Capacity for Change category; *financial, business, and entrepreneurial literacy* in the General Literacy category; and *ICT operations and concepts* in the Digital Literacy category.

Table 6. Descriptive statistics for self-assessment of core competencies, perceptions of required core competencies, and difference scores

Competencies	Self-assessment		Perceptions		Diff
	M	SD	M	SD	
Skills	4.53	1.18	5.18	1.05	.65
Critical thinking	4.38	1.07	4.65	1.23	.27
Collaboration	4.85	1.25	5.30	.99	.45
Communication	4.76	1.19	5.48	.87	.72
Decision-making	4.56	1.17	5.16	1.09	.60
Initiative and self-direction	4.61	1.13	4.91	1.08	.30
Leadership and responsibility	4.50	1.27	5.04	1.11	.54
Problem-solving	4.20	1.10	5.15	1.02	.95
Productivity	4.69	1.09	5.29	.97	.60
Research and inquiry	4.24	1.31	5.08	1.12	.84
Capacity for Change	4.64	1.13	5.03	1.03	.39
Adaptive learning	4.59	1.13	4.87	1.08	.28
Creativity/innovation	4.58	1.15	5.08	1.06	.50
Flexibility	4.76	1.10	5.14	.95	.38
General Literacy	4.46	1.23	4.69	1.17	.23
Citizenship/civic literacy	4.52	1.22	4.75	1.15	.23
Environmental literacy	4.44	1.41	4.34	1.42	-.10
Financial, business, and entrepreneurial literacy	4.00	1.33	4.66	1.25	.66
Global awareness	4.42	1.21	4.55	1.19	.13
Health literacy	4.42	1.35	4.40	1.29	-.02
Knowledge of core academic topics	4.28	1.15	4.62	1.16	.34
Life and career	4.67	1.15	5.02	.97	.35
Personal and social responsibility	4.92	1.04	5.09	.96	.17

Competencies	Self-assessment		Perceptions		Diff
	M	SD	M	SD	
Digital Literacy	4.24	1.31	4.60	1.19	.36
Digital citizenship	4.26	1.37	4.51	1.24	.25
ICT operations and concepts	4.15	1.39	4.69	1.19	.54
Information literacy	4.41	1.19	4.94	1.07	.53
Media literacy	4.14	1.27	4.27	1.25	.13

Discussion

Core competencies are essential for the final-year students' employment and subsequent careers (Espinoza & Ukleja, 2016; Rieckmann, 2012). To aid the planning of competency-focused education, this study transformed Burrus et al.'s (2013) core competencies framework into a measurement tool that assesses the students' possession of core competencies, their perceptions of required competencies for employment, and the gap between the two. The tool was named the Core Competencies for Employment Scale (CCES) and its factor structure, content validity, reliability, and usefulness for educational practice were explored in depth. To discuss the obtained findings, the focus now moves to presenting the findings and linking them to Burrus et al.'s (2013) framework, identifying implications for educational practice, and outlining the study's limitations, delimitations, and directions for future research.

In the core competencies framework, Burrus et al. (2013) grouped 24 core competencies identified in past literature (Binkley et al., 2012; Finegold & Notabartolo, 2008; Partnership for 21st Century Skills, 2012) into seven categories (see Table 1). Initial factor analysis found that these 24 competencies could be better grouped into three underlying factors, labelled as Skills, General Literacy, and Digital Literacy. However, an inspection of factor loadings revealed that not all competencies loaded onto the same factors when the CCES was used to evaluate the self-assessment of the final-year students' competencies and their perceptions of required competencies for employment. Given this discrepancy in factor loadings, as well as some indicators suggesting that a four-factor model could suit the data, the study tested a four-factor solution. Exploratory and confirmatory factor analyses suggested that the four-factor model was suitable for capturing students' self-assessment of core competencies and perceptions of required competencies for employment. The following four factors were identified and confirmed: Skills, Capacity for Change, General Literacy, and Digital Literacy. The reliability of the overall CCES and its four subscales was acceptable to excellent.

There was a noteworthy overlap between the four factors of the CCES and the categories of core competencies identified by Burrus et al. (2013). Categories of Analytical Skills, Interpersonal Skills, and Ability to Execute, together with their corresponding competencies, made up the Skills factor in the CCES. The Capacity for Change factor encompassed the three Capacity for Change competencies, and the Digital Literacy factor encompassed the four Information Processing competencies. The General Literacy factor combined the competencies of Core Topics and Themes of the 21st Century and Living in a Culture categories.

Despite the significant overlap, the results of this study indicate that core competencies of the 21st-century workforce are more accurately grouped into four versus seven categories originally identified by Burrus et al. (2013). These categories can be defined as follows. *Skills* are core competencies that are developed through practice and that help students navigate through cognitive, interpersonal, and motivational job demands, regardless of their career choice. *Capacity for change* competencies can assist students in expressing, developing, and adapting themselves when placed in new work environments, while *digital literacy* competencies allow them to embrace the technological advancements and requirements in future job positions. Finally, *general literacy* competencies are useful in equipping final-year students with the ability to navigate through the requirements of the 21st-century workforce, such as by being mindful of environmental, health and citizenship needs, understanding academic topics, operating in modern business environments, and balancing work/life demands.

Apart from identifying the most valid categorisation of core 21st-century competencies, this study demonstrated the usability of the CCES for crafting personalised educational plans that would foster the students' employability. The CCES could help educators understand which core competencies individual students have developed and which competencies they must develop further to enhance readiness for a diverse job market. In the assessed sample, results suggested that the students would benefit from boosting several competencies, including problem-solving, research and inquiry, communication, productivity, and financial, business, and entrepreneurial literacy. All these competencies are crucial for thriving in today's complex professional landscape (Burrus et al., 2013). These results, however, apply to a whole sample of final-year students', while, in practice, it might be better to gauge which areas of competencies individual students need to improve (Fariani et al., 2023).

If educators administer the CCES to identify a gap between a given student's core competencies and his or her perceptions of their importance, they could develop personalised educational plans that would inform the tailoring of

interventions to address specific core competencies gaps. For instance, they could leverage the insights from the CCES to create targeted learning experiences that would enhance particular competencies students think they are lacking. Such targeted learning experiences could encompass career dialogue, vocational coaching, and real-world projects that would aim to build a given set of competencies (Kuijpers & Meijers, 2011). This personalised approach would ensure that educational interventions are precisely aligned with a given student's core competencies gap and are tailored to help that particular student become employable irrespective of a chosen career path (Keppell, 2014).

Although it demonstrated the reliability, validity, and usefulness of the CCES for practice, this study had at least two limitations that must be considered when interpreting the findings. First, the research procedure for administering the CCES was not piloted to ensure that the provided definitions of the 24 core competencies are understandable to final-year students. Without such a pilot in place, the study could have failed to clarify the definitions of the competencies for the participants, thus reducing the accuracy of their responses and overall engagement in the assessment (Gudmundsdottir & Borck-Utne, 2010). Second, the CCES was developed to gauge the gap between the students' self-assessment of their core competencies and their perceptions of how these competencies are valued by employers. It is questionable whether final-year students have sufficient knowledge and awareness of how employers assess the significance of core competencies. In theory, it would have been better if the CCES had evaluated the gap between the students' self-assessment of core competencies and the employers' perceptions of these competencies' importance. However, this approach was deemed unfeasible for educational practice because it would require a collaborative effort between academic institutions and employers when assessing competencies and would pose a logistical challenge in the context of developing personalised educational plans. Nonetheless, the absence of employer input in the CCES raises concerns about the instrument's external validity as the tool may not accurately reflect the employers' perceptions of competency demands in the 21st-century professional landscape.

Though limited, the study had several strengths or delimitations that could have increased the trustworthiness of the findings. The sample size was sufficiently large (N = 521) for exploratory and confirmatory factor analyses (Flora & Flake, 2017). The sample was also balanced in terms of the participants' gender and it included final-year undergraduate students from seven universities across two countries. All these strengths translate to increased sample representativeness and generalisability (Briesch et al., 2014). The study also applied up-to-

date guidelines on performing exploratory and factor analyses (Flora et al., 2012; Kline, 2016) and was thus robust and methodologically sound, qualities enhancing the validity and reliability of its outcomes.

To improve the validity and practical usefulness of the CCES, future researchers need to overcome the limitations of this study. The first recommendation is to test the final-year students' understanding of the definitions of core competencies provided when administering the CCES. If it transpires that students misinterpret or do not fully understand some of the competencies, future scholars need to refine the definitions to ensure clarity and comprehension, and thus improve the accuracy of the assessment. The second recommendation is to administer the CCES to employers who are representative of a wide variety of professional fields. It would then be possible to gauge potential discrepancies in how employers and students evaluate the importance of the core competencies. If such discrepancies are abundant, then personalised educational plans could be developed by identifying gaps in the final-year students' core competencies and the importance of those competencies as assessed by employers. To overcome the potential logistical challenges recognised above, an option would be to use the employers' competencies ratings, as found in large-scale research studies, as a benchmark or a reference point whenever recognising the students' core competencies gaps. In this adaptation of the CCES, the students would need to evaluate their possession of core competencies only once and educators would then compare these competencies to the employers' ratings to identify areas for the improvement of core competencies. This procedure, however, would require an immensely large and fully representative sample of employers to ensure that their ratings of core competencies generalise to all professional fields (Briesch et al., 2014).

In conclusion, this research succeeded in developing and validating an instrument for pinpointing core competencies that final-year students need to develop to increase their employability in the 21st-century market. The implications of this study are noteworthy as the CCES can assist educators in developing personalised educational plans for the improvement of core competencies. Future research, however, needs to refine the CCES to address the identified limitations, specifically by testing and improving the final-year students' understanding of core competencies definitions and obtaining comprehensive input from a diverse array of employers.

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Razvoj i preliminarna validacija Skale za procenu osnovnih kompetencija za zapošljavanje (SPOKZ)

Apstrakt: Autori ranijeg perioda su osmislili okvir za prikaz osnovnih kompetencija za zapošljavanje radne snage u 21. veku. Taj okvir, međutim, nije korišćen za izradu personalizovanih obrazovnih planova unapređenja kompetencija studenata. U okviru ove studije je razvijena i validirana Skala za procenu osnovnih kompetencija za zapošljavanje (SPOKZ) kako bi se utvrdilo koje osnovne kompetencije treba da razviju studenti završnih godina kako bi bili zapošljivi u 21. veku. Uzorak je obuhvatio 521 studenta poslednje godine fakulteta, koji su ocenili meru u kojoj poseduju 24 osnovne kompetencije i meru u kojoj poslodavci cene te kompetencije. Razlike u tim dvema ocenama su doprinele utvrđivanju oblasti u kojima treba poboljšati osnovne kompetencije. U eksploratornoj faktorskoj analizi su 24 kompetencije grupisane u četiri faktora: veštine, kapacitet za promene, opšta pismenost i digitalna pismenost. Četvorofaktorska struktura skale je potvrđena. U studiji se iznosi zaključak da SPOKZ može da pomogne edukatorima da identifikuju osnovne kompetencije koje studenti treba da razviju pre no što se zaposle.

Ključne reči: osnovne kompetencije, radna snaga 21. veka, zapošljivost, personalizovani obrazovni planovi, obrazovanje usredsređeno na kompetencije

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