



# Development of 21<sup>st</sup> Century Skills in Croatia's Higher Education System\*

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**Abstract:** Social and economic developments of the 21<sup>st</sup> century require education systems that enable young people to acquire knowledge, skills, and competencies which, upon completion of their studies, would work in their favour and allow them to actively participate in the globalised and competitive labour market. Although the low employment rate is often caused by economic factors, one should also account for the interpersonal factors that may help individuals increase their chances of finding a job. Job seekers nowadays need to possess competencies known as 21<sup>st</sup>-century skills. This study included an assessment of the 21<sup>st</sup>-century skills acquired during academic studies. Creativity, innovation, communication in foreign languages, and practical application of knowledge were found to be the most poorly developed competencies, whereas the ability to work in a team, learn, and manage information were among the best-developed competencies.

## 1. INTRODUCTION

Education systems need to keep up with the social and economic developments of the 21<sup>st</sup> century to enable young people to acquire knowledge, skills, and competencies which, upon completion of their studies, would work in their favour and allow them to actively participate in the globalised and competitive labour market and thus underpin economic development in a system where one's competitive edge, and hence value, is based on knowledge, skills, and competencies (Ananiadou and Claro, 2009). Although the low employment rate is often caused by economic factors, one should also account for the interpersonal factors that may help individuals increase their chances of finding a job. It has been shown that, in addition to specialist knowledge and skills, one also needs soft skills to enter employment.<sup>2</sup> The combination of soft and hard skills is found in literature under the umbrella term *21<sup>st</sup>-century skills* (Hadiyanto, et al., 2021; Ananiadou and Claro, 2009). One reason why 21<sup>st</sup>-century skills are becoming increasingly important lies in the very nature of work which is changing at an increasing pace, namely jobs are becoming less formal, less structured and go beyond the routine. Term *21<sup>st</sup>-century skills* designates skills driven by the needs of the emerging models of economic and social development rather than those of the last century which were tailored to meet the needs of industrial production (Ananiadou and Claro, 2009). The Croatian Science Foundation has launched a programme called Building Institutional Quality Assurance Mechanisms and has also created financial instruments to support a number of higher education initiatives and efforts that would ensure the quality of higher education outputs and fulfilment of the latest eco-

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<sup>2</sup> *Soft skills* is a term that indicates personal transversal competencies such as social skills, communication skills, ability to work in a team and other personality traits that characterize relationships between people (Cimatti, 2016).

conomic needs (Croatian Science Foundation, Higher Education and Technological Development of the Republic of Croatia, 2007). The question that arises is whether the measures adopted to ensure the quality of education in Croatian higher education institutions result in the acquisition of 21<sup>st</sup>-century skills. This paper will discuss 21<sup>st</sup>-century skills and Croatia's higher education system, and present the survey results based on the views of respondents i.e. students, about the extent to which these competencies are developed in their school/study programme.

## 2. 21<sup>st</sup> CENTURY SKILLS

Key competencies required for lifelong learning are essential if one is to meet their personal, social and professional needs (AZVO, 2021). The concept of key competencies is closely related and largely intertwined with the concept of soft skills – namely, the skills that supersede higher education qualifications in job interviews. In the workplace, soft skills are seen as complementary to the knowledge and abilities one acquires through formal education. They characterize the way a person communicates to others, especially at work. Soft skills have more to do with who people *are* than what they *know*. As such, soft skills encompass traits that are much harder to learn, at least in a traditional classroom setting. They are also much more difficult to quantify and assess (Development and Education Centre Novo Mesto, 2018).

In order to hire someone, present-day employers require a balance between expert knowledge/hard skills and soft skills. Businesses have been placing great value on the soft skills that can be applied at the company level, such as the ability to work in a team, and that trend is increasing. Performance and productivity improve when workers share their knowledge and skills. The ability to learn new methods and technologies is also a soft skill valued among employers, along with problem-solving ability and IT literacy. For example, companies can perform more efficiently when all workers can solve minor software problems, rather than rely on the IT department for every fix. The concept of 21<sup>st</sup>-century skills stems from the modern business practices that have been insisting on the balance between expert knowledge/hard skills and soft skills (Ananiadou and Claro, 2009; WEF and BCG, 2015). They comprise broad knowledge and a wide range of skills, work habits and personality traits that are important for success in today's world, especially in modern careers and workplaces. Even though specific 21<sup>st</sup>-century skills can be defined, categorized, and determined depending on the workplace or educational institution, the term as such is rather general and quite fluid. The following list provides a brief overview of knowledge, skills, work habits and personality traits usually associated with 21<sup>st</sup>-century competencies (Ananiadou and Claro, 2009; WEF and BCG, 2015; Development and Education Centre Novo mesto, 2018):

- critical thinking and problem solving,
- information analysis, interpretation, and synthesis,
- research and testing skills,
- creativity, curiosity, imagination, innovation,
- persistence, self-motivation, planning, self-direction, adaptability, initiative,
- oral and written communication, public speaking and presentations, listening,
- leadership skills, teamwork and collaboration,
- IT and communication literacy, media and internet literacy,
- civil, ethical, and socio-legal literacy,
- economic and financial literacy, entrepreneurship,
- global awareness, multiculturalism, and humanitarianism,
- understanding of the ecosystem,
- health literacy, including diet, exercise and public health.

The concept of 21<sup>st</sup>-century competency reflects the belief that pupils/students should be taught the most relevant, useful, and universally applicable skills and knowledge. The underlying idea is that today's pupils, students, and young people who will reach old age in the 21<sup>st</sup> century need to master a set of skills different from one required in the 20<sup>th</sup> century and that the skills they learn need to meet the specific requirements of the complex, competitive economy and a knowledge-based society, in the information age of the 21<sup>st</sup> century.

The common perception is that most educational institutions do not pay enough attention to the preparation and ultimate success of their students in the 21<sup>st</sup>-century labour market, and advocating for the education system to place greater emphasis on interdisciplinary competencies and 21<sup>st</sup>-century skills is the common response whenever this issue is raised (Obadić, 2017). The question arises as to the true purpose of education. Is the purpose of education to get pupils/students to pass the exam and get a degree? Or is its purpose to enable pupils/students to be competitive and successful in the labour market and modern careers? The need to strengthen 21<sup>st</sup>-century skills is driven by the belief that all pupils/students should possess knowledge, skills, work habits, and character traits that will enable them to continue learning and improving themselves after graduation and that young people should be adequately prepared before they enter the labour market of the 21<sup>st</sup> century.

### 3. HIGHER EDUCATION IN CROATIA

Given that European societies strive to become knowledge-based societies, higher education is a key part of their socio-economic and cultural development (ESG, 2015). This aim is most clearly defined in the European Commission's *Europe 2020* document setting out three priorities that complement each other: 1) smart growth: developing an economy based on knowledge and innovation; 2) sustainable growth: promoting a more resource-efficient, greener, and more competitive economy; 3) inclusive growth: fostering a high-employment economy delivering social and territorial cohesion. All the measures defined in this document serve the ultimate purpose of creating a European environment conducive to growth and employment, as this is the only way to continue to finance the existing way of life (European Union Policies, 2015). According to the European Qualifications Framework for lifelong learning (EQF), *qualification* is a formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards. In the EQF, learning outcomes are defined as statements of what a learner knows, understands and is able to do on completion of a learning process. Learning outcomes are divided into three categories — such as knowledge, skills, and competence, where *competence* means the proven ability to use knowledge, skills, and personal, social and/or methodological abilities, in work or study situations and professional and personal development. The nationwide harmonisation of competencies according to learning outcomes in Croatia began in March 2006, when the development of the Croatian Qualifications Framework (CQR) started. CQR is an instrument for unifying and coordinating all parts of the qualification system in Croatia. It enables quantification and mutual comparison of learning outcomes and enables the school and education programmes to respond to the demands of the labour market. The curricula were analysed to determine whether the teaching methods lead to the achievement of the ultimate goal, i.e. the ability to apply knowledge in practice. Competencies as outcomes of education are measurable and their value exists only in terms of their practical applicability.

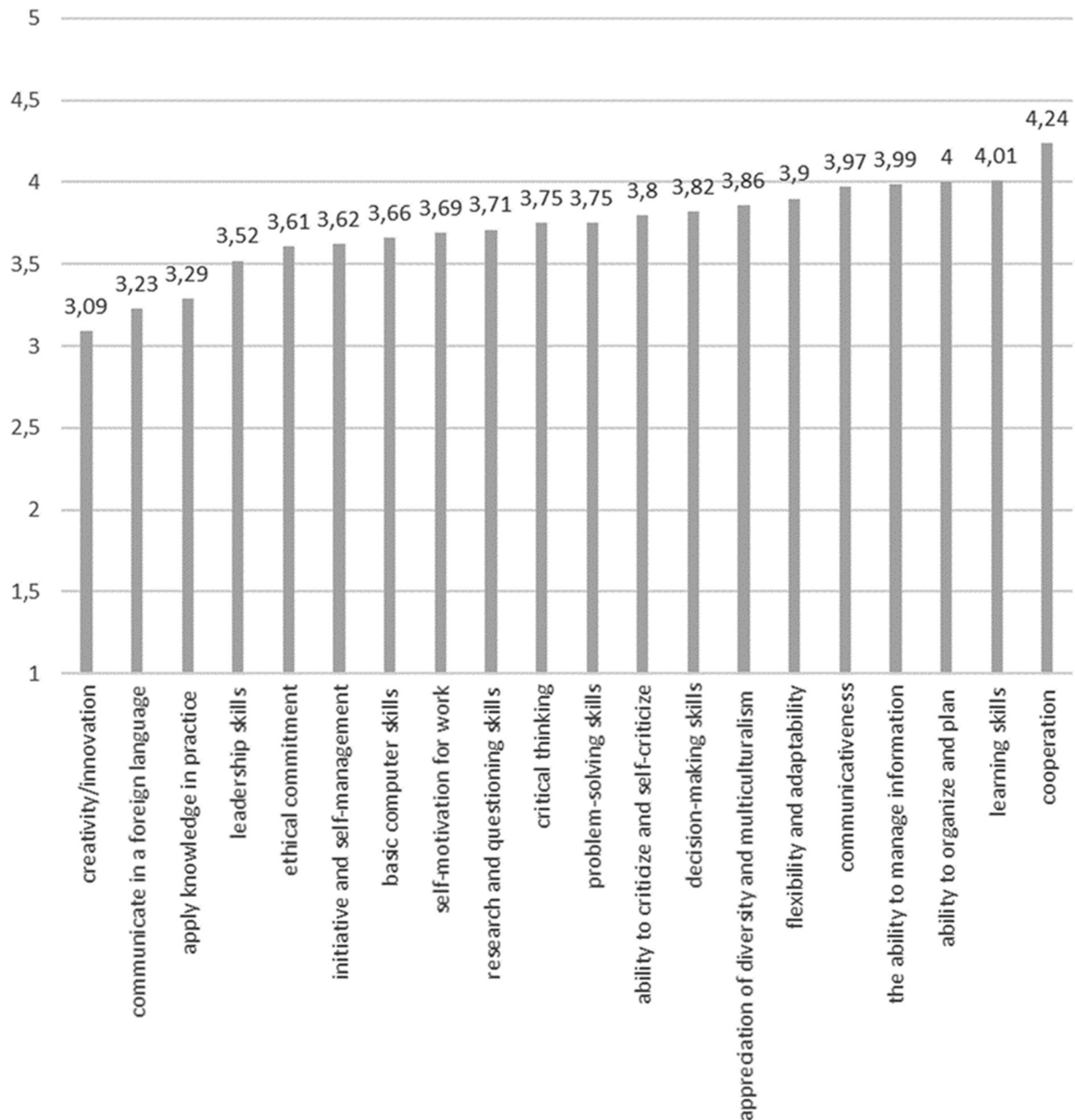
#### 4. OBJECTIVES AND METHODOLOGY

The aim of this study was to find out the extent to which students believe that they have developed 21<sup>st</sup>-century skills i.e. to what extent the development of these skills was fostered and realised throughout their studies. The study was conducted in 2018, with a total of 1041 students participating. The results represent the respondent's beliefs and own judgments. Respondents were students of the four largest Croatian universities, more specifically the students attending schools that had been enrolling the largest number of students in the previous ten years, according to the Croatian Bureau of Statistics (CBS, 2017: 483-502; CBS, 2016: 505-524; CBS, 2015: 513-530), which means the largest number of workers with such qualifications in the labour market. The universities whose students participated in the study are: University of Rijeka (School of Economics, Law School, Engineering School, School of Humanities and Social Sciences — Department of Pedagogy and Information Science Department); University of Split (School of Economics, Law School, School of Electrical Engineering, Mechanical Engineering and Naval Architecture, School of Humanities and Social Sciences - Department of Pedagogy); University of Zagreb (School of Economics, Law School, School of Electrical Engineering and Computing, School of Humanities and Social Sciences — Department of Pedagogy and Department of Information Science); and Josip Juraj Strossmayer University of Osijek (School of Economics, Law School, School of Electrical Engineering and School of Humanities and Social Sciences - Department of Pedagogy and Information Science). A survey questionnaire was selected as a primary means of collecting data, namely students' answers to questions. The survey was conducted in the academic year 2017/2018. The author opted for deliberate sampling, which she conducted herself. Scheduling of final year classes presented a challenge and ultimately prolonged the period in which the survey was conducted.

#### 5. RESULTS

This section presents the results of the study on the development of 21<sup>st</sup>-century skills in relation to the school/study programme the respondents attended. The extent to which individual competencies are developed among students of economics, law, technical sciences, information sciences and pedagogy will be analysed. Respondents were attending the final year of study (Year 2 of graduate studies) and assessed the level of development of individual competencies on a scale of 1 to 5 where: 1-unsatisfactory, 2-poor, 3-good, 4-very good, 5-excellent. The 21<sup>st</sup> century competencies assessed were: creativity/innovation, critical thinking, problem-solving ability, decision-making ability, flexibility and adaptability - the ability to adapt to a new situation, cooperation - the ability to work in a team, ability to communicate - communicativeness, oral and written communication in a foreign language, basic computer skills, the ability to manage information - collecting and analysing information from various sources, research and questioning - research skills, ethical commitment, the ability to apply knowledge in practice, leadership skills - leadership and responsibility, appreciation of diversity and multiculturalism, initiative and self-management, learning skills, ability to organize and plan, ability to criticize and self-criticize, self-motivation for work.<sup>3</sup>

<sup>3</sup> See: Common European Framework of Reference for Languages, Digital Competence Framework, Entrepreneurship Competence Framework, PISA Programme Competence.

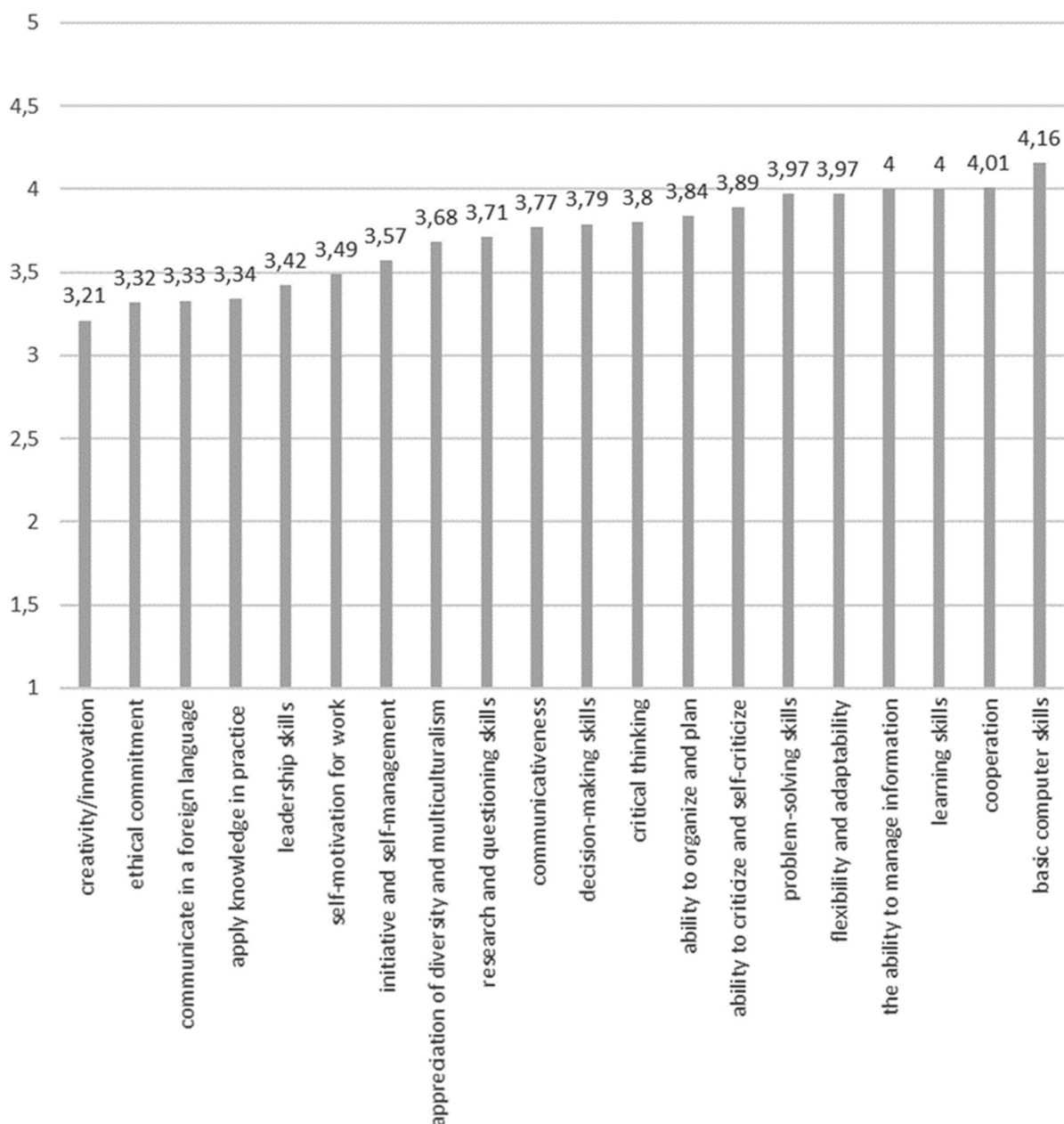


**Figure 1.** Students' competencies - Schools of Economics

**Source:** Dedukić, 2018 - Primary survey results

Picture 1 shows that the respondents think that the schools of economics invest the least effort in developing creativity and innovation, then communication in a foreign language and finally the ability to apply knowledge in practice. These competencies were given a score of 3 (3.09 — 3.29 - good) by the respondents. According to the respondents, the following competencies are being developed to the highest degree: collaboration, learning skills, ability to organize and plan and manage information (score 4 — 4.24 - very good). None of the competencies were given scores of 1 (unsatisfactory), 2 (poor) or 5 (excellent).

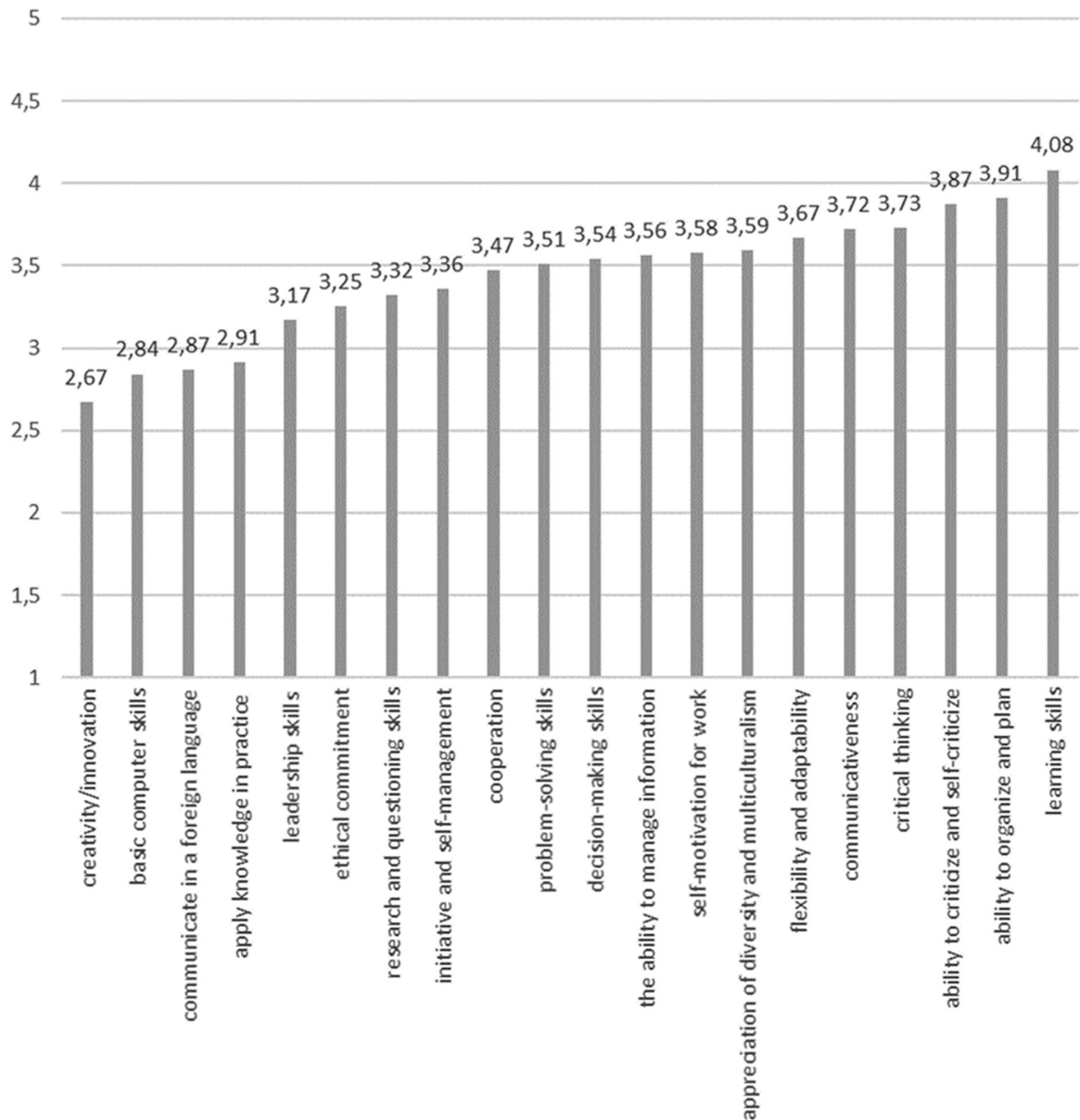




**Figure 2.** Students' competencies - Schools of technical sciences

**Source:** Dedukić, 2018 - Primary survey results

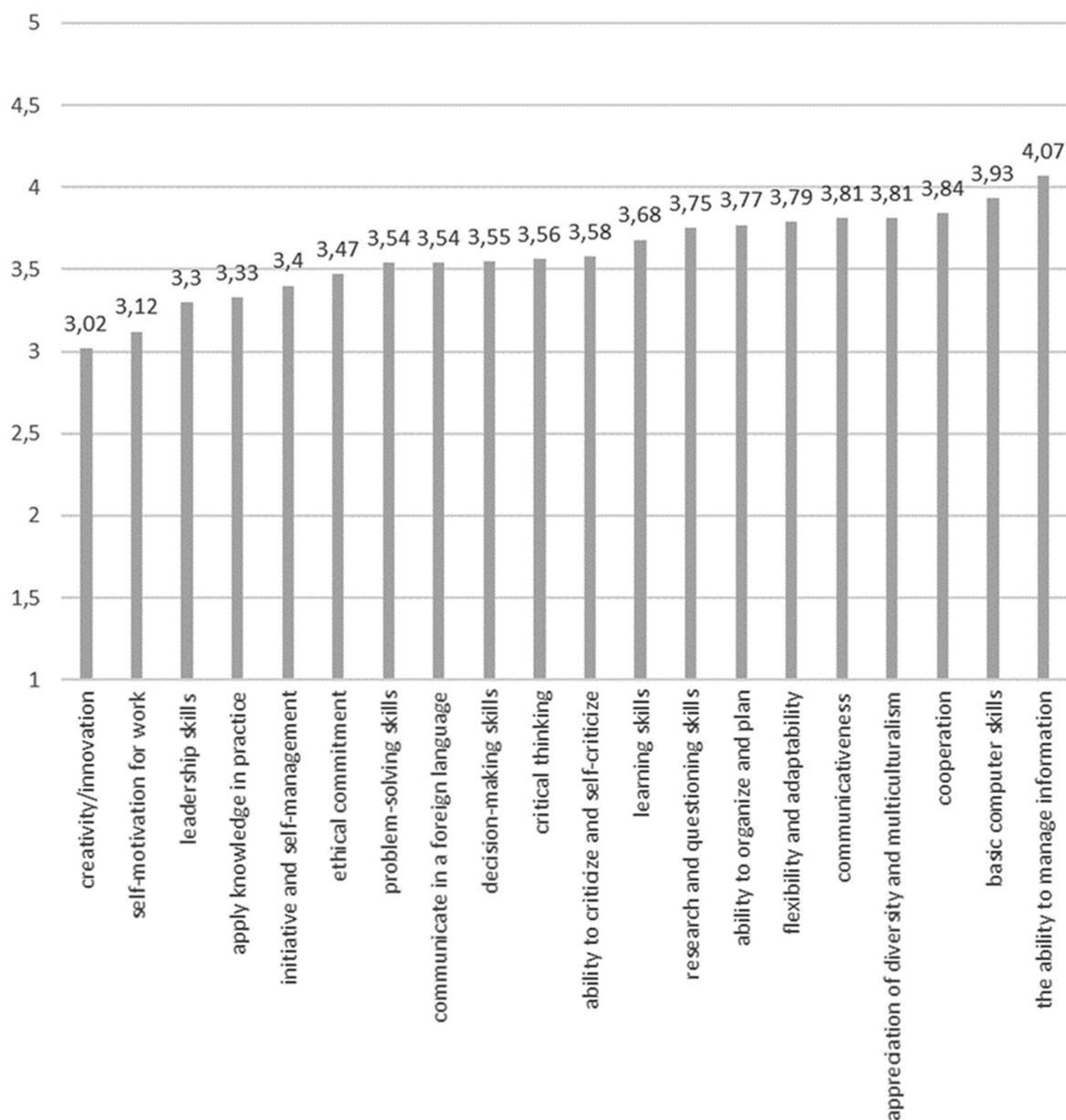
Picture 2 shows that the respondents think that the schools of technical sciences invest the least effort in developing creativity, ethical commitment, and communication in foreign languages. These competencies were given a score of 3 (3.21 — 3.33 - good) by the respondents. According to the respondents, the following competencies are being developed to the highest degree: collaboration, teamwork, learning skills, and information management skills (score 4 - 4.16 - very good). None of the competencies were given scores of 1 (unsatisfactory), 2 (poor), or 5 (excellent).



**Figure 3.** Students' competencies - Schools of law

**Source:** Dedukić, 2018 - Primary survey results

Picture 3 shows that the respondents think that the schools of law invest the least effort in developing creativity, computer skills, and communication in foreign languages. These competencies were given a score of 3 (2.67 — 2.87 - good) by the respondents. According to the respondents, the following competencies are being developed to the highest degree: learning skills, ability to organise and plan, ability to criticise and self-criticise (score 3.87 — 4.08 - very good). None of the competencies were given scores of 1 (unsatisfactory), 2 (poor), or 5 (excellent).

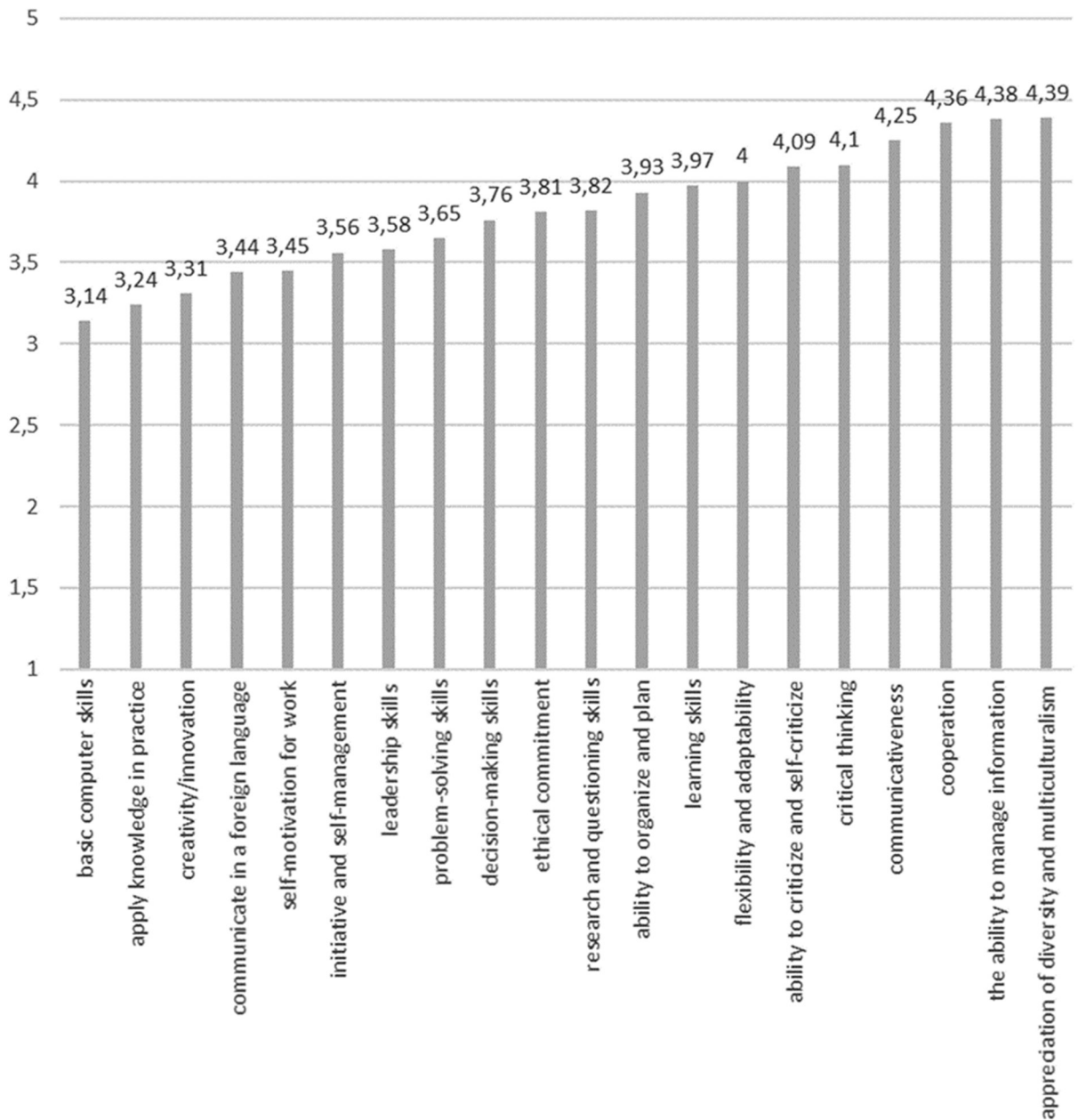


**Figure 4.** Students' competencies - information sciences programmes

**Source:** Dedukić, 2018 - Primary survey results

Picture 4 shows that the respondents think that the schools of information sciences invest the least effort in developing creativity, self-motivation for work, and management skills. These competencies were given a score of 3 (3.02 — 3.3 - good) by the respondents. According to the respondents, the following competencies are being developed to the highest degree: information management skills, computer skills, and teamwork (score 3,84 - 4.07 - very good). None of the competencies were given scores of 1 (unsatisfactory), 2 (poor), or 5 (excellent).





**Figure 5.** Students' competencies - pedagogy study programmes

**Source:** Dedukić, 2018 - Primary survey results

Picture 5 shows that the respondents think that the pedagogy study programmes invest the least effort in developing basic computer skills, the ability to apply knowledge in practice, creativity and innovation. These competencies were given a score of 3 (3.14 — 3.31 - good) by the respondents. According to the respondents, the following competencies are being developed to the highest degree: information management skills and teamwork (score 4.36 - 4.39 - very good). None of the competencies were given scores of 1 (unsatisfactory), 2 (poor), or 5 (excellent).

## 6. CONCLUSION

Higher education, science, and innovation are cornerstones of social cohesion, economic growth, and global competitiveness. However, the increase in employers' demand for skills and competencies requires a change in the higher education system if it is to supply them. Therefore, education systems are to be brought up to date to teach young people modern skills and to align with the needs of the modern economy. Education institutions should test more than just knowledge of content, i.e. hard skills. Instead, they should teach a combination of basic and new knowledge and soft skills such as teamwork, communication and leadership. This study sought to establish the extent to which the Croatian higher education system develops the 21<sup>st</sup>-century skills of students. From the analysis of the study it follows that the competencies found to be developed to the lowest degree among the respondents are: creativity and innovation, oral and written communication in foreign languages, and the ability to apply knowledge in practice (score 3 — good). The competencies that the respondents found to be developed to the highest degree are: teamwork, learning skills, information management skills (score 4 - very good). Interestingly enough, the respondents did not give scores of 1 (unsatisfactory), 2 (poor) or 5 (excellent) to any of the competencies presented to them. For young people, finding work is one of the major steps in their transition into adulthood. In countries where education is not sufficiently aligned with the latest demands of the labour market, young people face a number of obstacles to employment and are often left to their own devices when it comes to being competitive after completion of formal education — which includes various courses and seminars as a form of form additional training, to acquire knowledge that was not acquired during education.

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