The development of students' academic skills from the aspect of a pandemic Covid-19

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Abstract

The university course should offer more than the exclusive promotion of technical academic qualifications. It is also intended to stimulate and support employability, personal development and social commitment. The growing importance of the concept of competence is primarily due to the change in the requirement structures in gainful employment and the dynamics of social development. In a society of knowledge and options, people have to adapt to a large number of situations that require more than the application of learned knowledge. They must have more learning requirements and skills than before that enable them to continue learning throughout their working lives. All contributions follow a multi-dimensional competence orientation, but focus on the modeling of cognitive competences of students as well as construct validation. This theoretically and methodologically significant question of whether instruments developed for the measurement of competencies in the higher education sector actually capture what is expected of them and what the later use and interpretation of the test scores are based on seemed to us of far-reaching importance in view of the complex field of university research. The higher education landscape in Croatia is in a state of upheaval, and not just as a result of the reforms initiated in the Bologna Process. Thus, the main purpose of this research will be to show what are attitudes of students of Pedagogy at the Faculty of Humanities and Social Sciences in Osijek (Croatia) like, according to the use of the Moodle system in teaching. Furthermore, it will also seek to gain insight into how often teachers use the Moodle system. The research was conducted at the Faculty of Humanities and Social Sciences in Osijek (Croatia), at the graduate and postgraduate level from 15th April to 20th June of the academic year of 2020. In order to create the competency profile for the consecutive teacher training course in work studies, the selected modules of the course were queried in a standardized form with a survey. In addition to the level specification, the teachers should indicate whether the learning objectives are queried as an examination performance. In the summary of all modules, a simple frequency analysis can then be used to show which learning objectives are taught and checked with which proportion of those responsible for the module from the Covid-19 pandemic aspect.

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1. Introduction

Academic skills are necessary for students to successfully complete their studies, create a career, and to be capable of lifelong learning and the labor market. There is also considerable potential for change in the composition of the students. And that only names two change processes in the Croatian higher education landscape. It is no longer just the classic students who embark on a course of study after completing their Abitur or technical college entrance qualification. Rather - also based on the author's experience - there is an increasing number of students who only decide to study in the course of their educational and professional biography [1]. As a result, the group of students is becoming increasingly heterogeneous and the competencies that students bring into a course can no longer be clearly differentiated [3] The tendency for a professional and educational biography to flow into the academic sector in the course of lifelong learning is increasing. This permeability is desirable and desirable, but it also marks a paradigm shift in the Croatian educational landscape.

As a result of these tendencies, new challenges arise in the design of courses as well as on the educational policy level. How should the skills of this new group of students be dealt with? To ignore these would be neither efficient nor socially enforceable. Universities are faced with the challenge of finding a transparent and quality-assured way of dealing with non-academic skills that have already been acquired during a course of study. But what does competency actually mean? And to what extent are the universities supported in their role in terms of educational policy? The demands of this group of students can be derived from the European educational reforms [1]. This begs the question, how this is dealt with at the national level and what legal framework conditions have been created. However, legal frameworks alone are hardly sufficient to initiate operational feasibility. On the basis of this question, educational policy initiatives should be mentioned that have developed possible instruments for this purpose. On the basis of these developments, there were federally funded projects that dealt with the operational feasibility in the context of model developments or initiated developments.

2. Competence level and MOODLE system

The "Academic Competences Quality Assurance" or ACQA method for short determines the academic competence profile of a course based on seven competence fields. According to ACQA, seven fields of competence are distinguished with the help of which the abilities and skills of university graduates can be described [9]. In consultation with representatives of the subject, the eighth field of competence was defined: the teaching profession-specific competence. This summarizes the special requirements for a teacher training course [2]. Perceived employability is an important predictor of future successful student employability. In the conditions of an uncertain labor market with an unfavorable economic situation, it is important to examine how students can increase their competitiveness in the labor market and facilitate the transition from the education system to the labor market. This paper sees the importance of acquiring academic competencies and skills related to the profession for which students are educated in order to increase employability. Resources in this process can be the support of social networks and the experience of volunteering and working during studies [6]. The paper points to the need to raise awareness and inform students about the importance of developing academic skills that they need to take in terms of increasing their competitiveness in the labor market. Opportunities to gain experience for young people need to be made more visible and accessible, and also to harmonize educational policy with the modern characteristics of the labor market and the characteristics of the student population. Precisely for these reasons, information and communication technologies can help raise awareness of this issue [8]

The eight fields of competence are defined below for students in the consecutive teacher training-related study course in Work Studies:

1. They are familiar with one or more scientific disciplines. They have a broad and integrated knowledge in their discipline and understand the scientific basis of their learning area. You are able to deal with specialist scientific knowledge.

2. You will be able to conduct research. Furthermore, you will be enabled to gain new knowledge by researching facts. Research means: gaining new knowledge and insights in a targeted and methodically based manner.

3. You will be able to solve development and application tasks. You will be empowered to design and implement development tasks as part of project work [5]. Development is understood as an activity aimed at the realization of new or modified concepts and products.

4. You have a scientifically systematic working and approach. This is characterized by the use of theories, models, and systematic knowledge. Graduates have a critical attitude and understand the nature of science.

5. They have basic intellectual skills. They can think logically and argue their position, they can reflect and form an opinion. These skills are learned and improved in the context of a scientific discipline but are generally applicable afterward.

6. You are competent in cooperation and communication. Graduates can work with and for others. This not only requires appropriate interaction, a sense of responsibility, and leadership behavior but also good communication with colleagues and non-colleagues. University graduates are also able to take part in a scientific or public debate.

7. They integrate the overall social context into their work. Science does not exist in isolation but is always in a societal context. Beliefs and methods have their origin; Decisions have social consequences. University graduates are aware of this; They integrate these insights into their work and strategies and

8. Specific skills for the teaching profession University graduates are able to structure, prepare, and convey learning content [5].

They can address the characteristics of the learners and assess their performance [7]. The thesis aims to determine the competence profile of the simple study module based on eight competence fields.

Academic skills are necessary for students to successfully complete their studies, create a career, and to be capable of lifelong learning and the labor market. The research will determine which categories of academic skills are most developed by students while using the Moodle system in their classes. Thus, the main purpose of this research will be to show are attitudes of students of Pedagogy at the Faculty of Humanities and Social Sciences in Osijek (Croatia), according to the use of the Moodle system in teaching. Furthermore, it will also seek to gain insight into how often teachers use the Moodle system from the aspect of a pandemic Covid-19. In the next step, there is an evaluation of competence field-specific learning objectives. Each of the eight fields of competence summarizes four to nine learning objectives, which are recorded in terms of their desired level of mediation. A distinction is made between five levels, on the basis of which the desired level of the respective competence goal is recorded. Table 1 lists the five levels by means of which the desired deepening of knowledge and skills can be described [6]. The levels are defined as examples, i.e. when selecting a level, not every criterion has to be met. Rather, the table serves as a guideline for the respondents' decision. Those responsible for the module are asked to indicate the desired level of communication for the relevant learning objectives.

Table 1
Competence level of academic skills

Level 1	Level 2	Level 3	Level 4	Level 5
factual and theoretical basic knowledge	detailed knowledge in a subject	Application of defined knowledge; Processing of tasks with clear solutions	Application of knowledge in complex contexts; ambiguous solutions	Work in the border area of current theory formation or the current state of research

guided work with limited independence	Organization of processes within general guidelines	Independent planning and organization of resources and processes within general guidelines	Independent planning and organization of resources and processes; Inclusion of social and ethical aspects	Independent planning and organization of resources and processes; high sense of responsibility for oneself and for others

(Source: author)

Moodle is a learning a platform that enables teachers to enrich their classroom teaching with e-learning elements. For example, files can be easily shared with students via Moodle. But Moodle offers a lot more. With various tools, Moodle can also be used, for example, for collaborative learning or for testing knowledge. Moodle enables the provision of existing multimedia. Materials such as digital worksheets, images, films, animations, websites, etc. that can be easily integrated into courses. The teachers can continue to use existing digital teaching materials so that they do not have to do any extra work in the procurement of materials. However, Moodle shows its advantages particularly in the cooperative development, improvement, and provision of recurring lesson content (e.g. grammatical exercises, projects, development of free work materials and learning stations, etc.). The collaborative work can take place regardless of time and location. The role of the Moodle system for acquiring and promoting the academic skills of pedagogy students from the aspect of a pandemic Covid-19. That is, it is very important to examine the impact of the Moodle system during the COVID-19 pandemic on how it affected the development of students' academic skills.

2.1.　Research methodology

In order to create the competency profile for the consecutive teacher training-related study course in industrial studies, the selected modules of the study course were queried in a standardized form with a survey by Moodle. In the run-up to the survey, the procedure in the Institute Council was coordinated with the implementing team, a list of the modules to be recorded (all compulsory and elective modules of the core subject of work studies) was drawn up and the relevant module managers were informed in a letter about the survey and asked to select an appointment for the interview. The survey first briefly explained the scope of the survey as well as the method and established a common understanding of the eight fields of competence and the levels. After this brief introduction, those responsible for the module were free to answer the questionnaire online. The questionnaire can be found in Appendix 2. In the first step, the basic module data (module title, credit points, etc.) were checked in a personal interview. Subsequently, those responsible for the module should name the fields of competence to which the module contributes substantially. In the next step, the estimated time expenditure was given in percentages for the selected fields of competence. In the second part of the questionnaire, the learning objectives were asked about their intended level of communication. In addition, those responsible for the module were asked to indicate for each learning objective whether it was also part of the examination. The intentions of the teachers were asked, i.e. which learning objectives you would like to convey to the students at which level with your module from the COVID-19 aspect. Finally, an open question was asked about the special features of this course compared to other courses. In the following sections, the results for the teaching degree related to bachelor's and master's degrees in industrial studies are presented. The results are based on a purely descriptive evaluation; further statistical significance tests were not carried out due to the small number of cases. In this respect, tendencies are worked out and then compared with the course objectives formulated in the study regulations. The evaluation takes place in three steps: First, the basic data relevant for the survey and evaluation are summarized. In the second step, the academic competence profile of the consecutive course is presented. This competence profile gives an overview of the percentage distribution of the time expenditure (100% in total) over the eight competence fields. To determine the competence profile, the percentages are weighted and averaged across all the modules of the Bachelor's degree and separately for the Master's degree. The result is shown in a radar plot. In a third step, the learning objectives are

evaluated for each field of competence. A quantitative methodology was used in SPSS data processing. From the descriptive statistics procedure, the following were applied: calculation of frequencies, percentages, Chi-square ($\chi 2$), t-test, ANOVA, and correlation coefficient (Cramer's V (ρc) coefficient). The procedure of inferential statistics of Chi-square hydrates and the procedure of descriptive statistics of the correlation coefficient were applied in determining the statistically significant difference and the correlation between the opinions of the respondents concerning the setting of the variable in the research. The t-test and ANOVA procedure was applied to establish connections and relationships.

2.1.1. Results

A total of nine module managers were asked about one or more modules (a total of 4 modules) for the teaching-related bachelor's degree in industrial studies (core subject). For the teaching profession-related master's course in industrial studies (core subject), a total of five module owners were asked about one or two modules (a total of 2 modules). For the core subject assessed here, all the modules listed are compulsory modules, so that weighting according to study components is not necessary. Here, too, the second subject and the master's thesis were not included in the analysis for the reasons mentioned above.

Table 2

Bachelor's degree in industrial studies (core subject) - 4th modules

| %	Study area	Proportion of the module in the study area (= weighting according to%)	MD	MOD	SD
28	Educational theories	0.18	2.62	1	1.65
16	Multimedia learning	0.12	1.58	1	0.78
26th	Media education	0.07	2.85	1	1.25
30th	Research with children	0.25	1.58	1	0.45

N = 100

(Source: author)

Table 3

Master's course in industrial studies (core subject) - 2 modules

%	Study area	Proportion of the module in the study area (= weighting according to%)	MD	MOD	SD
68	Media education	0.16	1.52	1	1.11
32	School menadment	0.19	1.58	1	0.92

N = 100

(Source: author)

The competency profile of the bachelor's and master's degree courses in industrial studies is determined on the basis of the weighting set out above. The respective compulsory and compulsory elective modules were included in the evaluation in accordance with the ratio of compulsory elective and compulsory areas prescribed in the study and examination regulations. For the weighting of the modules, the number of credit points was also taken into account in the evaluation (Graph 1).
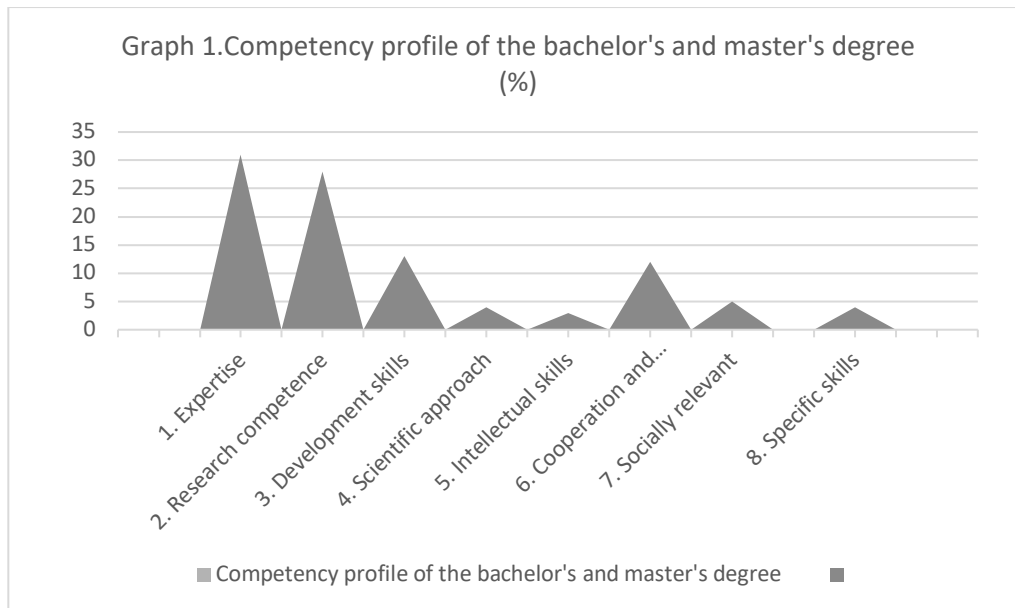
Graph 1.Competency profile of the bachelor's and master's degree (%)

(Source: author)

The competency profile of the bachelor's and master's degrees in industrial studies shows the average distribution of the student workload across the eight fields of competence. The different priorities in both study levels are clearly recognizable: While the Bachelor's degree is primarily about imparting professional competence (Bachelor 22%; Master 14%), the Master primarily focuses on teaching profession-specific skills (Master 21%; Bachelor 13%). Conveyed the next largest share of student working time is spent on acquiring skills and abilities in the area of cooperation and communication. The teachers estimate that the students spend around 9% of their time in the Bachelor's degree and 11% in the Master's degree in acquiring these skills. The area of development competence is placed proportionally similar in this course. Here 10% of the time is invested in the Bachelor and 11% in the Master. The skills that are important for the competence areas Scientific Approach, Intellectual Skills and Competencies relevant to society play a supporting role with 8-9% of the time in both study levels. The teaching of research qualifications takes up the least amount of time. In addition to the distribution of the workload across the competence areas, individual learning objectives were recorded for the eight competence fields with regard to their desired level. It was also asked whether the addressed learning objectives were also checked.

Learner-centeredness and competence orientation is becoming increasingly important not only in adult education but also at universities and colleges. According to the editors, there is a need for research and reflection on the conclusions and practical consequences that arise for academic teachers. For example, which competencies are required in order to be able to implement learner-centered and competence-oriented teaching? The university's further education area is expanding and is now one of the core tasks of the university. According to Ada Pellert [4., 10], the Croatian University for Continuing Education is increasingly promoting the mission of lifelong learning to the higher education sector. Continuing education is this increasingly institutionalized.

The following two figures show the frequencies of the specified levels for the learning objectives of the subject area of expertise.

Graph 2. Expertise in the bachelor's degree in industrial studies (core subject) (%)
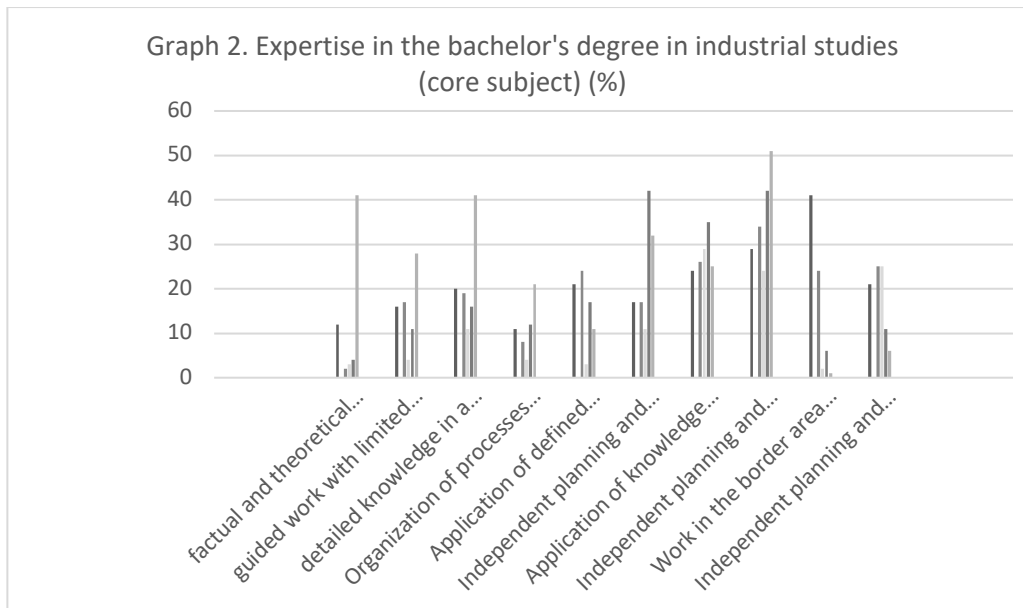
(Source: author)

(Legend: factual and theoretical basic knowledge, guided work with limited independence, detailed knowledge in a subject, Organization of processes within general guidelines, Application of defined knowledge; Processing of tasks with clear solutions, Independent planning and organization of resources and processes within general guidelines, Application of knowledge in complex contexts; ambiguous solutions, Independent planning and organization of resources and processes; Inclusion of social and ethical aspects, Work in the border area of current theory formation or the current state of research, Independent planning and organization of resources and processes; high sense of responsibility for oneself and for others)

Graph 2. shows for the master's degree that the proportion of learning objectives for which a higher level is sought increases significantly, with the indication that a very high level is still the exception. It is particularly important to the teachers that the students learn to "recognize and close their own knowledge gaps" even in highly complex contexts.

Table 4

Results of the correlation analysis for individual variables " 1. Independent planning and organization of resources and processes within general guidelines," and " 2. Application of knowledge in complex contexts; ambiguous solutions."

			in total	1 level	2. level	3. level	4. level
bachler			.83 **	.73 **	.78 **	.74 **	.57 **
masters			.61 **	.48 **	.68 **	.43 **	.40 **

** p <.001, (Source: author)

In the correlation analysis, the Pearson linear correlation coefficient was applied, and since it is not possible to determine a statistical significance based on the correlation coefficient alone, a t-test was

applied to determine the significance of the correlation coefficient. High correlations were found in the overall score on individual variables concerning the obtained excellent score at the end of the academic year or semester with variables: level 1., level 2., level 3, and level 4. The comparison of imparted and tested learning objectives in the area of research competence summarizes the impression made above: The learning objectives subsumed in the area of research competence is addressed by around half of the respondents and examined by around a third. This finding corresponds to the small proportion of time in the competence profile of the degree program for the area of research competence. The distribution of the level information in the field of Scientific Approach is very heterogeneous. The learning objectives are not taught at all or at all levels from very low to very high (levels 1-5). When it comes to the learning objectives "systematic approach" (36%) and "recognizing developments" (40%), some teachers have very high demands on teaching. In the bachelor's program, the level specifications for learning objectives in the field of cooperation and communication are again very heterogeneous. Written and oral communication (38%) is aimed primarily at an intermediate level (level 2-3). For the learning objectives "behave professionally" (44%) and "teamwork" (68%), a majority of strives for high to very high levels (levels 4-5).

Table 5

Correlations between respondents 'opinions on whether they trust information from various innovative media (ICT, Internet, social networks, mobile applications) encountered in the process of learning from the COVID-19 aspect and the academic skills.

	MOODLE-system	COVID-19	Acade mic skills
more than 20 sources	.54 **	. 51 **	.42 **
mostly I believe		. 57 **	.39 **
Master-studies			.44 **

** p <.001, (Source: author)

To check the correlation of individual opinions of respondents regarding the frequency of MOODLE - system belief in information from the media and the overall result on a scale with a general estimate of the frequency of use of professional academic skills by the time of COVID-19, Pearson correlation coefficients were calculated and shown in Table 5.

Table 6.
Students' opinions on the importance of the type of academic competence

The importance of the type of academic competence	Students (%) respondents	MOD	SD	MD
Special competence	**24**	1	1.25	2.15
Research procedure	16	1	0.78	2.13
Development competence	**21**	1	0.56	2.15

Scientific property	11	1	1.26	1.62
Intellectual skills	4	1	2.15	1.78
Cooperation and communication	2	1	1.36	2.11
Competent competencies	4	1	1.36	1.96
Teaching specific competencies	**18**	1	1.11	2.15
N	100%			

Table 6. indicates that respondents are by the variable social competence (24%,), followed by the variable development competence (21%), in the third-place is the variable teaching specific competencies (18%). There was a statistically significant difference and a slight correlation between respondents by cooperation and communication competence teaching competencies ($\chi2 = 99.47$ df = 17, p <.05, Cramér ь s V = .07).

3. Conclusion

Education is indispensable; it cannot be acquired against, but only in society. But this includes the expectation that all adolescents acquire the ability to be reflective of social reality, to be critical, with the ability to distinguish and the willingness to think about change. There is not just one option associated with education, such as the educated bourgeoisie option of creating the world. Education opens up an open horizon of opportunities in plural societies. The education system has to prepare for this open horizon, able to choose according to its own interests, but aware of the fact that the recognition of each other is the condition for the possibility of personal development.

According to the study regulations, the teaching-related bachelor's degree in industrial studies aims to qualify students for their professional future as teachers in school service and further education, taking into account developments in science and the professional world. Furthermore, the students should be enabled to do independent scientific work, to think critically, and to act in a socially responsible manner. With regard to the technical subjects of work theory, they should be enabled to solve tasks, to be able to make judgments as well as to perform on their own and be responsible. The technical knowledge of the labor theory should enable the planning, conception, and implementation of subjects of the labor theory with low complexity. Economic and political framework conditions are to be integrated into the work [11]. The aim of the teacher training-related master's course in industrial studies is to prepare its graduates "for their work with young people in educational institutions, especially in schools". This includes subject didactic content, specialist knowledge from the field of work theory (professional orientation, technical action, economic planning) as well as educational content. This includes subject-didactic content, specialist knowledge from the field of work theory (professional orientation, technical action, economic planning), and educational content. Furthermore, it is the goal that the graduates can carry out their professional activities on a scientific basis and evaluate them critically, especially in schools [12]. This includes subject-didactic content, specialist knowledge from the field of work theory (professional orientation, technical action, economic planning), and educational content. Furthermore, it is the goal that the graduates carry out their professional activities on a scientific basis and can critically assess them. The 'Lifelong Learning' institution of higher education will only differentiate between different learners in different phases of life who have different previous experiences, but are all adulthood and have to combine different requirements in terms of time and organization. The competency profile of the bachelor's degree program has its clear focus on the specialist competencies relevant to industrial studies, followed by the competencies that are specific to the acquisition of a teaching profession. The consideration of socially relevant issues, the area of cooperation and communication, intellectual skills, scientific approach, and development skills play a supporting role for these focal points, each accounting for around 14% of student working time. Only research competence plays a subordinate role in a bachelor's degree in

industrial studies. In this respect, the objectives of the course are confirmed. Overall it can be clearly seen that the course objectives already formulated in the study and examination regulations correspond very well with the teaching objectives in the evaluated modules. In addition, the consecutive course is characterized by interdisciplinary, a systematic combination of theory and practice as well as the imparting of key competencies and project work in a special way.

Finally, it must be noted that the role of teachers have changed drastically over the past few years, especially in the field of informatics and related subjects. With the advent of the Moodle the system, their role has changed from a passive lecturer professor to an active research professor, who, taking advantage of all the benefits of new technologies facilitate the teaching process and at the same time makes teaching more interesting and effective. This research showed that MOODLE- can improve the development of academic skills at the undergraduate level, and was especially shown during the COVID-19 pandemic. This research can serve as a drop in the example that other skills needed for work, preparation for the labor market, and especially when we are still in the time of the COVID-19 a pandemic may be developed through the Moodle system. It is very important to develop new teaching / learning modules for distance learning to promote selected academic key competencies with the help of the new ICT, this was particularly evident in the time of COVID-19.

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