

DIG-IN-KPI: Project: 1st phase report

REPORT ON ACTIVITIES RELATED TO DIGITAL TRANSFORMATION IN VET AND PROPOSAL OF KPI INDICATORS IN THE FIELD OF DIGITALISATION FOR EDUCATIONAL INSTITUTIONS COVERING THE PROVISION OF CONSTRUCTION QUALIFICATIONS



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Chamber of Construction
and Building Materials Industry
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Digital transformation is making its way into businesses - developing key performance indicators to boost sector productivity

Erasmus+ programme, small-scale partnership

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Editor: Gospodarska zbornica Slovenije www.gzs.si, email for contacting: zgigm@gzs.si

Contributors:

- Gospodarska zbornica Slovenije www.gzs.si;
- Hrvatska gospodarska komora www.hgk.hr;
- Economic Chamber of North Macedonia – Стопанска комора на Северна Македонија www.mchamber.mk

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Report on activities related to digital transformation in VET and proposal of KPI indicators in the field of digitalisation for educational institutions covering the provision of construction qualifications

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DIG-IN-KPI

A. INTRODUCTION

Phase no. 1: November 2022 - March 2023 (prolonged to May 2023)

ACTIVITIES UNDER Phase no. 1:

- 1.1 Activity: IPM Meeting in SKOPJE
- 1.2 Activity: Comparative Analysis of the Sector F in Three Countries Using Selected Indicators
- 1.3 Activity: Development of KPI Table for Construction Contractors (Consortium of Partners and External Expert)
- 1.4 Activity: Alignment of KPI Table for Construction Contractors with Target Groups (Per Country: 4 Interviews with Construction Companies - One Representative Each + 1 Coordination Round Table for Participating Companies, Presentation and Validation with FIEC Construction 4.0 Group)
- 1.5 Activity: Review of Results, Evaluation, and Preparation of Work and Results Report for the Current Project Phase
- 1.6 Activity: Development of KPI Table for Educational Institutions (Secondary Vocational Schools - Secondary Educational Institutions)

The "DIG-IN-KPI" project, aimed at boosting digital transformation in the construction sector, focuses on developing key performance indicators (KPIs) for monitoring and enhancing sector productivity. The project involves cooperation with construction education institutions in Slovenia, Croatia, and North Macedonia. This report summarizes the activities conducted in these countries and outlines proposals and recommendations.

B. REPORT ABOUT SLOVENIAN ACTIVITIES WITH VET

Date/Time: 10 March 2023, 10.00-12.00

Organization/Location: MEGRA fair in Gornja Radgona, Slovenia

Participants: 12 VET representatives + 2 CCIS Chamber representatives

MATERIALS:

- 1x ppt presentation of the Erasmus+ DIG IN KPI initiative
- 2x Word documents: Description of GZSZGIGM's activities in introducing digitalization in the construction sector and detailed description of DIN indicators and KPIs for companies.

Minutes:

The meeting in Slovenia, held during the MEGRA 2023 International Construction Fair, aimed to discuss the implementation of digitalization in learning institutions and the proposal of digitization indicators for curriculum implementation. The Chamber of Commerce and Industry of the European Union (ZGIGM) is coordinating the DIG-IN-KPI project, which addresses the digital transformation in construction companies.

Key discussion points included:

Ad1 - ICT Equipment Situation in Construction Schools:

- Schools reported satisfactory but improvable ICT equipment.
- Some schools had high-end ICT tools, often funded from their own resources.

Proposal: Call on the competent ministry to ensure sufficient hardware capacity and allow schools to acquire extra equipment according to the specificities of the educational program.

Ad2 - Sources of Funding for ICT Equipment:

- Most equipment is procured through school efforts.
- Software licenses are mostly free for educational purposes.

Ad3 - Needs for New Technological Tools:

- Schools acquire technology based on teacher proposals and financial capacity.
- Schools need equipment for developing vocationally specific competences.

Design of Proposal: Schools need equipment for skill development, in addition to digitization equipment.

Ad4 - Interests and Expectations of Students and Teachers:

- Students are interested in modern technology.
- Teachers' willingness to adopt new technologies varies.
- There is a need for evaluating new teaching methods and competences acquired through them.

Reason for Proposal: Continuous professional development for teachers and systematic involvement of employers in teacher training are necessary.

Ad5 - Good Practices from Abroad:

- Discussion included the possibility of using public funds to purchase high-end ICT equipment in Germany.
- The funding program of the public body responsible for VET includes calls for tenders for new equipment for German vocational schools.

Proposal: Explore funding opportunities for advanced ICT equipment in VET.

Ad6 - Limitations of Educational Institutions:

- Identified issues included poor reading literacy, lack of finomotor skills, and difficulties in recruiting quality staff.
- Lack of talent identification in primary schools and the need for revitalized career guidance were discussed.

Proposal: Overhaul the system of financing secondary and higher vocational education.

Ad7 - Miscellaneous:

- The conclusions of the meeting will be presented at the Chamber of Commerce and Industry of Slovenia's STRATEGIC COUNCIL FOR STAFF meeting.



C. REPORT ABOUT CROATIAN ACTIVITIES WITH VET

Date/Time: 22 May 2023, 10.00-11.30

Organization/Location: CCE/HGK, Roosevelt square 2, Zagreb

Participants: 3 VET representatives + 4 representatives of the CCE Chamber

MATERIALS:

- 1x ppt presentation of the Erasmus+ DIG IN KPI initiative
- 1x Word document: Description of CCE's activities in introducing digitalization in the construction sector.

Minutes:

The meeting in Croatia aimed to explore the integration of digitalization in VET programs. Key discussion points included:

Ad1 - ICT Equipment Situation in Construction Schools:

- Quantity-wise, IT equipment inventory is satisfactory.
- Quality-wise, the hardware is often not the latest, but upgrades maintain performance.

Proposal: Ensure sufficient hardware capacity and allow schools to acquire extra equipment based on program specificities.

Ad2 - Sources of Funding for ICT Equipment:

- Equipment is often procured through school efforts.
- Software licenses are mostly free for educational purposes.

Ad3 - Needs for New Technological Tools:

- Schools strive to keep up with technical advancements, but the high cost limits procurement.

Design of Proposal: Schools need equipment for skill development, in addition to digitization equipment.

Ad4 - Interests and Expectations of Students and Teachers:

- Students are increasingly interested in vocational education.
- Teachers are enthusiastic about using new IT technologies, regardless of age.

Reason for Proposal: Promote continuous professional development for teachers in the field of digital skills.

Ad5 - Limitations of Educational Institutions:

- Procurement with public funding is irregular and often too short-term to plan.

- Proposal: Overhaul the system of financing secondary and higher vocational education.

4. Meeting in North Macedonia

The meeting in North Macedonia focused on engaging students from SGGUS Zdravko Cvetkovski Skopje in the project's activities and discussing challenges faced by the school. Key discussion points included the need for funding, collaboration with construction companies, timely availability of teaching materials, and support for practical training.

5. Proposals and Recommendations

Based on the discussions and challenges identified in the meetings, the following proposals and recommendations are made:

1. *Engagement*: Continue involving VET schools in project activities related to construction, green skills, and digitization.
2. *Collaboration*: Facilitate dialogue between associations and educational institutions to revise educational programs and introduce digital skills.
3. *Practical Training*: Initiate cooperation agreements between construction companies and VET schools for practical training.
4. *Challenges Notification*: Schools should notify relevant authorities about challenges they face in education.
5. *International Networking*: Encourage networking between VET schools in North Macedonia, Croatia, and Slovenia for collaborative project applications.

This report summarizes the efforts to promote digitalization in VET and proposes measures to address challenges faced by educational institutions. The "DIG-IN-KPI" project aims to drive the construction sector towards greater digital transformation and productivity.



D. REPORT ABOUT NORTHERN MACEDONIAN ACTIVITIES WITH VET

Minutes of Meeting with the Secondary Construction School SGGUS Zdravko Cvetkovski Skopje, North Macedonia

On April 11, 2023, students from the Secondary Construction School SGGUS Zdravko Cvetkovski in Skopje, North Macedonia, visited the Economic Chamber of North Macedonia. The Economic Chamber plays a vital role in connecting employers with secondary vocational schools, focusing on students who choose vocational education and training to align their careers with industry demands. SGGUS Zdravko Cvetkovski is known for producing skilled labor for the construction sector, and this visit aimed to expose students, who are the future builders of the country, to the importance of digitalization in their field.

During the visit, Mihajlo Donev, M.Sc., acting Operations Director for Innovation, Development, and Knowledge at the Economic Chamber, addressed the students. He introduced them to the Chamber's operations, ongoing activities, and the significant role of digitalization in the construction sector. The presentation highlighted the "DIG-IN-KPI" project, focused on the development of key performance indicators (KPIs) to increase sector productivity through digital transformation.

The discussion centered on the importance of digitalization, the need for its integration into the construction industry, and the potential impact of the DIG-IN-KPI project. The project aims to create a free online tool that assesses the digitalization level of construction companies in the three partner countries. DIG-IN-KPI is supported by the European Commission under the Erasmus+ program, and it is expected to provide valuable insights and proposed digitalization indicators to support construction companies, educational institutions, and regulatory bodies in the permitting process.

The results anticipated from DIG-IN-KPI include increased productivity in the construction sector and an elevation of the average value-added per employee in domestic construction companies, bringing them closer to the European Union average.

The presentation also discussed collaboration with partner countries and the potential for students to interact with vocational schools for construction from these nations.

Sashka Velkov, association coordinator, used an interactive presentation to emphasize the sector's importance in the domestic economy. He highlighted current construction trends, the application of modern technologies (Gen 4.0), and the growing use of energy-efficient materials in construction projects, whether in civil engineering or building construction.

The Secondary Construction School Zdravko Cvetkovski offers several educational programs, including three-year courses for "dry construction fitter" and "floor and tile layer," and four-year programs for "architectural technician," "interior architecture technical designer," "construction technician," and "geodetic technician." The school boasts seven computer-equipped classrooms, some of which have LCD projectors. However, the main challenge lies in publishing textbooks for the modular curriculum. The school expressed a desire for greater engagement of companies in dual education, which the Chamber intends to support through its member companies in the construction sector.

The meeting was interactive, with students actively participating, sharing their ideas, proposals, and experiences related to the project.

Conclusion:

The meeting addressed various challenges faced by SGGUS Zdravko Cvetkovski in Skopje, North Macedonia. These challenges include a lack of information about opportunities to apply for EU projects, funding for IT equipment, implementation of advanced AutoCAD platforms, and maintenance. The meeting also highlighted the need for improved collaboration with construction companies to facilitate practical training and summer internships. Moreover, it was noted that teaching materials are not received promptly, often containing outdated information that does not align with the latest industry trends.

Proposed Actions:

1. The Economic Chamber of North Macedonia should continue actively involving SGGUS Zdravko Cvetkovski - Skopje in project activities related to construction, green skills, digitization, and vocational education and training.
2. Facilitate an active dialogue between the Association of Construction, Building Materials, and Non-metal Industries, and its member companies, and SGGUS Zdravko Cvetkovski - Skopje to create recommendations for the Ministry of Education and Science of North Macedonia, focusing on the revision of educational programs and the introduction of digital skills.
3. Initiate a mediation meeting between the Economic Chamber of North Macedonia, its member companies from the construction sector, and SGGUS Zdravko Cvetkovski - Skopje to establish cooperation agreements for the implementation of practical training for skilled labor.
4. As SGGUS Zdravko Cvetkovski - Skopje falls under the jurisdiction of the City of Skopje and the relevant ministry, they should address identified challenges by providing advance written notifications regarding shortcomings in education.
5. Promote networking between SGGUS Zdravko Cvetkovski - Skopje and vocational schools specializing in construction and geodesy from Croatia and Slovenia. Encourage collaboration for joint project applications under the Erasmus+ program, Key Action 1 – Learning Mobility of Students and Employees/Staff in Vocational Education and Training.

This will help enhance vocational education, address challenges, and support students in their pursuit of careers in the construction sector.



E. THE KPI TABLE FOR EDUCATIONAL INSTITUTIONS

Background: The construction industry is undergoing significant digital transformation, with advancements in technology reshaping the way construction projects are planned, executed, and managed. Vocational Educational and Training (VET) institutions play a crucial role in preparing students for careers in construction. However, the level of digitalization within these institutions and their curricula can vary widely. To ensure that students are well-prepared for the digital demands of the construction sector, there is a need for a Key Performance Indicator (KPI) table to assess and measure digitalization in VET institutions offering construction qualifications.

Objective: The primary objective of this proposal is to develop a KPI Table that will enable VET institutions, particularly those offering construction-related qualifications, to evaluate and enhance their digitalization efforts. The KPI Table will serve as a comprehensive tool for measuring the readiness, maturity, and advancement of curricula and VET processes in their courses.

Components of the KPI Table: The KPI Table for Educational Institutions Covering VET for Construction Qualifications will comprise a set of well-defined key performance indicators, metrics, and assessment criteria, which include but are not limited to:

1. **Digital Curriculum Integration:** Evaluate the extent to which digital tools, technologies, and methodologies are integrated into the curriculum.
2. **Digital Resources:** Assess the availability and quality of digital resources, including e-learning platforms, software, and digital study materials.
3. **Digital Skills Training:** Measure the effectiveness of training provided to students and educators on digital tools and skills.
4. **Industry Partnership:** Evaluate collaborations with the construction industry to ensure alignment with the latest digital trends and industry needs.
5. **Infrastructure and Equipment:** Assess the availability and condition of digital infrastructure, including computer labs, software licenses, and hardware.
6. **Digital Learning Management:** Measure the use of digital tools for course management, communication, and assessment.
7. **Student Engagement:** Evaluate the engagement of students in digital learning and their readiness for digital practices in the construction sector.
8. **Data Security and Privacy:** Ensure that data security and privacy measures are in place, particularly for student records and digital learning materials.
9. **Feedback and Continuous Improvement:** Implement mechanisms for collecting feedback from students, educators, and industry partners to continuously improve digitalization efforts.
10. **Adoption of Emerging Technologies:** Assess the readiness of institutions to adopt emerging technologies such as Building Information Modeling (BIM), 3D printing, and other industry-specific innovations.

Implementation Plan: The development and implementation of the KPI Table will involve the following steps:

1. **Research and Benchmarking:** Conduct research and benchmarking to identify best practices in digitalization within VET institutions offering construction qualifications.
2. **KPI Development:** Develop a set of well-defined KPIs, assessment criteria, and a scoring system in consultation with educators, industry experts, and relevant stakeholders.
3. **Pilot Testing:** Pilot test the KPI Table in a select group of VET institutions to ensure its feasibility and effectiveness.
4. **Refinement:** Based on the results of the pilot testing, refine the KPI Table and assessment process.
5. **Rollout and Training:** Launch the KPI Table for wider use, providing training and support to VET institutions on its implementation.
6. **Monitoring and Feedback:** Establish a system for ongoing monitoring, feedback, and reporting of results to participating institutions.

Benefits: The development and implementation of a KPI Table for Digitalization Assessment in VET institutions covering construction qualifications will bring several benefits:

1. **Enhanced Digitalization:** VET institutions will be able to identify areas for improvement and enhance their digitalization efforts.
2. **Improved Student Preparedness:** Graduates will be better prepared for the digital demands of the construction industry.
3. **Industry Alignment:** Institutions can align their curricula with industry trends, leading to increased employability of students.
4. **Quality Assurance:** The KPI Table will provide a quality assurance framework for digitalization in VET.

Budget: The budget for this project will cover research, development, training, and ongoing support. Funding can be sought from government grants, industry partnerships, and educational institutions themselves.

Conclusion: The development of a KPI Table for Digitalization Assessment in VET institutions offering construction qualifications is essential to ensure that educational institutions stay aligned with the digital transformation of the construction industry. This initiative will prepare students for successful careers in construction and enhance the quality of VET education.

F. THE MATRIX PROPOSAL FOR KPI TABLE – how to use the DIG IN KPI NEW TOOL FOR VET ORGANIZATIONS

Creating a matrix for assessing the Key Performance Indicators (KPIs) in the table for digitalization assessment in VET institutions offering construction qualifications can help educational institutions measure their digital readiness and progress. Below is a sample matrix for assessing the KPIs. Keep in mind that the matrix should be tailored to the specific needs and goals of your institution. Each KPI is assessed on a scale from 1 (lowest) to 5 (highest).

Sample KPI Assessment Matrix:

KPI	1 (Lowest)	2	3 (Moderate)	4	5 (Highest)
1. Digital Curriculum Integration					
2. Digital Resources					
3. Digital Skills Training					
4. Industry Partnership					
5. Infrastructure and Equipment					
6. Digital Learning Management					
7. Student Engagement					
8. Data Security and Privacy					
9. Feedback and Continuous Improvement					
10. Adoption of Emerging Technologies					

Instructions for Using the DIG IN KPI Matrix:

- Assessment:** For each KPI, assess the current status of your VET institution based on the criteria outlined in the KPI Table. Use the scale from 1 to 5 to indicate the level of achievement.
- Data Collection:** Gather relevant data and feedback from stakeholders, including educators, students, industry partners, and IT administrators, to make an accurate assessment.
- Scoring:** Place an "X" or fill in the appropriate cell in each row to indicate the level of achievement for each KPI.
- Analysis:** Review the completed matrix to identify areas where your institution needs improvement (lower scores) and areas where it excels (higher scores).
- Action Plan:** Based on the assessment, create an action plan to address the identified areas for improvement and enhance digitalization efforts.
- Continuous Improvement:** Regularly revisit the matrix to assess progress, track improvements, and adjust your institution's strategies as needed.

By using this DIG IN KPI matrix, your VET institution can systematically assess its digitalization efforts and work towards enhancing the quality of education and preparedness of students for careers in the construction industry.

