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Project Management Skills for Non-management Students from the Perspective of Education for Sustainable Development

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Abstract: *Project management skills (PM skills) play an essential role in advancing sustainable development (SD) objectives. Project management as a goal-oriented approach aligns with the SD framework. They provide a structured framework for planning, implementing, and monitoring projects, making them invaluable for advancing Sustainable Development Goals. They support effective stakeholder engagement, risk management, and adaptive approaches, while also fostering cross-cutting competencies that are vital for addressing sustainability challenges in diverse contexts.*

Project management is crucial in the workplace nowadays, and possessing these skills can significantly enhance students' employability prospects.

This research aims to analyze the coverage of project management skills and competencies in the Ukrainian academic standards and generalize the recommendations for effectively embedding these skills into the curriculum.

Methodology. Qualitative content analysis of Ukrainian academic standards developed by the Ministry of Education and Science of Ukraine. 38 academic standards for master's contain project management skills. There are challenges with the implementation of the standards in terms of alignment between the standards and the academic programmes, including teaching-learning-assessment practices.

Project-based learning and interdisciplinary projects are essential for ESD and PM skills development. Interdisciplinarity is a pillar of ESD and this will open project management concepts and practices for non-management students as they navigate the complexities of team dynamics, task delegation, and project coordination. Mentoring and peer-to-peer learning could be effective tools for ESD and for PM-skills development. Peer learning groups where senior students can guide non-management students in developing project management skills. The mentorship can provide valuable guidance, feedforward, and feedback throughout project-based learning.

1. PROJECT MANAGEMENT SKILLS AND SDG 4: EMPLOYABILITY PERSPECTIVE

According to the reports "The Future of Jobs", which have been published by the World Economic Forum since 2016 WEF (2016), WEF (2018), WEF (2020), WEF (2023), the labour market in all sectors of the economy is experiencing significant changes globally. These reports showed that many traditional skills have not been relevant nowadays. Experts are increasingly declaring that the skills that machines cannot replace will be in demand, at least in the near future WEF (2023), provided they develop in combination with technological skills.

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According to QAA and Advance HE (2021), students expect sustainable development to be implemented into their institutional practices and curricula. "In the 2020 National Union of Students Skills Survey, 91% of respondents agreed their place of study should actively incorporate sustainable development – up from 88% in 2014; while 83% would like to see sustainable development actively incorporated and promoted across all courses – up from 71% in 2014." (p. 5).

Based on Project Management Institute (PMI) analysis in 11 countries on five continents it is expected the opportunity for project-related job growth to be 33 percent collectively. Moreover, the set of the most popular skills for project managers includes leadership, technical management, as well as strategic and business management PMI (2017). As noted by PMI, this situation strengthens the role of project managers in stimulating changes and innovations in the organizations where they work. In this regard, PMI predicts that by 2027, employers will need 87.7 million people who will work in positions focused on project management. China and India will represent more than 75% of the total project management-oriented employment. So, we can also talk about the growing demand for project management professionals and professionals in sustainable development. According to PMI (2017), the latest PMI-commissioned talent gap analysis by Anderson Economic Group (AEG) points to outstanding opportunities in jobs and career growth for project managers within the 11 countries studied. Through 2027, the project management-oriented labour force in seven project-oriented sectors is expected to grow by 33 % or nearly 22 million new jobs. PMI (2017) shows that project managers are important contributors to productivity. Talent shortages in the profession can potentially create risks of nearly US$ 208 billion in GDP over the 10 years in the 11 countries examined. Project management skills are not only valuable in project management roles but are also demanded by employers in a wide range of industries and job positions. Therefore project-management skills can enhance students' employability and thus, should be recognised as essential and highly relevant to sustainability, particularly SDG 4 Quality Education. These skills are highly relevant to target 4.4 which implies "by 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs, and entrepreneurship". According to PMI (2017) the trend of a deficit of professionals with project-oriented skills, identified in 2008, has increased and even exceeded forecasts, which was shown by the analysis conducted in 2012. The main reasons for this are a significant increase in the number of jobs that require project-oriented skills, an attrition rate, including retiring professionals, and significant growth in demand for professionals with project management skills, especially in fast-growing economies such as China and India.

2. SUSTAINABILITY IN PROJECT MANAGEMENT

Connecting project management with sustainability is a process that has begun with the adoption of sustainability principles by practitioners. Proposals have been defined in a global context since 2008 – the World Congress of the International Project Management Association (IPMA) put forward a statement about the need for project management professionals to "take responsibility for sustainability" McKinlay (2008). This statement was preceded by several studies related to the need to implement sustainability principles in the project management approach to overcome globally recognized threats to the planet, people, and further prosperity. Nowadays the link between project management and sustainability has been thoroughly explored. Brent and Labuschagne (2006), Labuschagne and Brent (2008, 2011), and Pade et al. (2008) acknowledge the insufficiency of efforts in this direction (Gareis et al., 2010). Since then, there has been a constant development of project management towards sustainability.

Progress in promoting sustainability is substantial (Gareis et al., 2011, 2013). However, researchers have identified problems that prevent the implementation of sustainability in project management. Among them, Silvius and Schipper (2014a) argue that the lack of sustainability which is considered in the context of project management prevents sustainability from being operationalized.

Another important aspect of sustainability implementation in project management is the qualification of managers. What knowledge and skills should project managers have to successfully implement the concept of sustainability in practice?

Silvius and Schipper (2014b) investigated how sustainability competencies are covered by the most important standards of project management competencies. Emphasizing the important role of a project manager in implementing sustainability, they insist on developing an appropriate set of competencies that allow them to carry out this role. Even though the concept of competencies is not new to project management, standards for project management competencies are available from PMI and IPMA (two of the world's leading professional organizations). Ndubuka and Rey-Marmonier (2019) investigated how Responsible Management Education contributes to the achievement of SDGs. The experience of SDGs implementation in curricula is widely presented as well by Fiselier et al. (2018), and Giangrande et al. (2019).

So, we have posed the research questions such as:
1) How are competencies for sustainable development close to project management skills?
2) How are project management skills represented in the Ukrainian landscape of higher education and how are these competencies constructively aligned with the programme learning outcomes?

Methodology. Qualitative content analysis of Ukrainian academic standards developed by the Ministry of Education and Science of Ukraine.

The data selection involved a search for programme learning outcomes and subject-specific competencies or/and generic competencies related to project management. As search strings, we used the terms 'project management' in Ukrainian academic standards or simultaneously with 'project' or 'project management'. To compare the content of academic standards in terms of representation of managerial skills we included also "strategic management", "technology management", "time management" and "team management" in the search.

3. THE LINK BETWEEN UNESCO'S KEY COMPETENCIES FOR SUSTAINABILITY AND PROJECT-MANAGEMENT SKILLS

The question of to what extent project management skills related to UNESCO's key competencies for sustainability does not have an agreed answer. Oyalowo et al. (2010) considered project management education can be used as a catalyst for sustainable development. Silvius and Schipper (2014b, 2015) analyzed publications related to education for sustainable development, including the five key competencies for sustainable development in management education programmes, as well as the level of inclusion of sustainability competencies in the ICB Project Management Competency Standard version 3. They came to the conclusion that intended competencies are partly covered by ICB3 project management competencies. In particular, strategic thinking competency and interpersonal skills are well covered: strategic thinking competency

is covered in ICB3 technical competencies, and interpersonal skills in ICB3 behavioral skills. Whereas systems thinking and normative competencies are partially covered by ICB3 project management competencies. Guraziu (2023) analyzed the model of project management as a sustainable pedagogical device in higher education. Guraziu (2023) considered project management as a concept different from project-based learning and gave the argument that project management methodology is more closely aligned with problem-based and inquiry-based learning methodologies.

It is essential to consider competencies for sustainability as a dynamic concept. As Leicht et al. (2018) noticed sustainable development will need to continue to evolve. The process of exploration and defining the future of ESD is continuing to engage different stakeholders nationally and globally. "Among other things, ESD will have to be responsive to changing contexts and emerging trends such as the recognition of sustainable development as a chosen lifestyle among the young generation rather than a series of environmental or related challenges" Leicht et al. (2018, p. 15).

Embedding a sustainability component in the teaching and learning professional component of academic programmes can be very useful for developing both cohorts of skills (Avelar et al., 2019; Cebrián et al., 2020; European Commission, 2020; Fia et al., 2023; Giangrande et al., 2019; Hammer & Lewis, 2023; Jones et al., 2008; Lemarchand et al., 2022).

Some research emphasized a strong connection between project management and sustainability implementation (McCarthy & Eagle, 2021). ESDConsulting (n.d.) considered projects to be effective for encouraging interdisciplinarity, teaching, and learning methodology as a recognized approach to bringing sustainable learning to the curriculum and extra-curricular activity.

According to the European Commission (2020), "The jobs of tomorrow require skills for the twin transitions. The green transition requires investments in the skills of people to increase the number of professionals who build and master green technologies, including digital, develop green products, services and business models, create innovative nature-based solutions and help minimize the environmental footprint of activities" (p. 12). Both concepts ESD and project management involve the development of students' ability to make non-standard decisions and innovate, as well as the ability to work in a team, cooperating with various stakeholders to achieve specific goals.

Several directions of connection between project management skills and Education for Sustainable Development can be distinguished, based on the competencies for sustainable development that UNESCO has identified as necessary for the training of specialists regardless of the field of study and/or specialty (Figure 1).

Strategic competence. The long-term vision that is immanent in the ESD aims to contribute to the long-term perspective of sustainable development, taking into consideration the well-being of current and future generations. The strategic focus of ESD is reflected in one of the competencies for sustainable development – strategic competence. However, implementing a long-term vision can be enabled through the development of project management skills.

Project management is based on planning and goal setting. The latter is fundamental in project management. That is, strategic competence as one of the competencies for sustainable

development can be developed through the development of project management skills if the programme is constructively aligned. Tuononen et al. (2022) confirm that well-organized and coordinated teaching, learning and assessment, which involves active learning methods, in particular, project-based learning, improves student learning of generic skills. That is, the embedding of such skills in disciplinary courses takes place primarily through methods of learning, teaching and assessment. According to QAA and Advance HE (2021) developing strategic competence confirms enabling the strategic achievement of goals globally and locally. This involves planning and assessment tools to identify and address sustainable development challenges, demonstrate flexibility and resourcefulness and adapt a problem-solving mindset to fit changing or unforeseen circumstances. Meanwhile, project management is highly effective for developing students' planning and assessment skills.

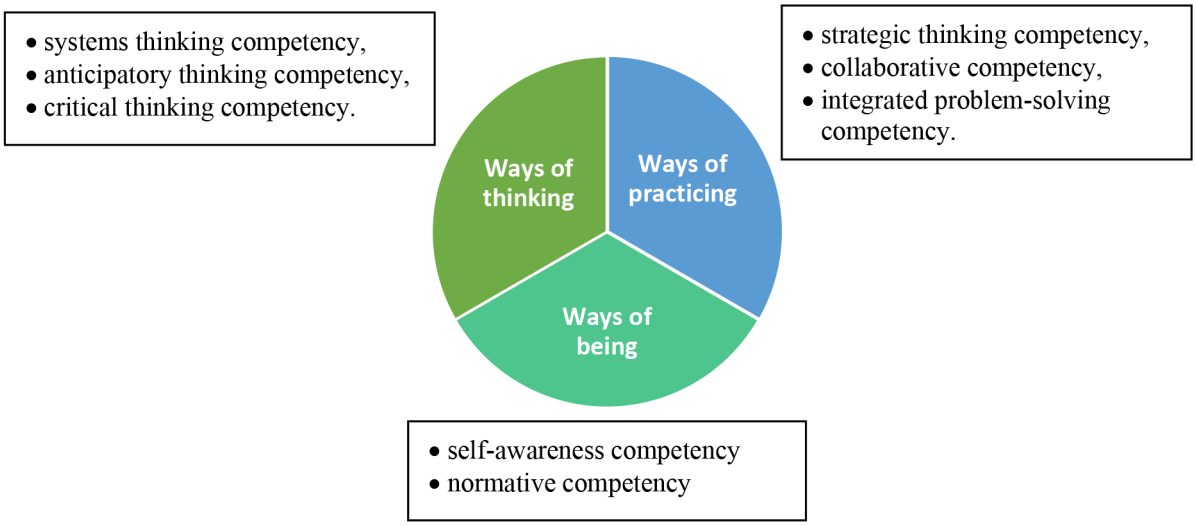

Figure 1. Key competencies for sustainability
Source: UNESCO, 2017

Interdisciplinarity. In the context of students' learning not only in management, but also in other majors, both for project management and for education for sustainable development, an interdisciplinary approach is important, since sustainability as a concept that integrates environmental, economic, and social aspects is interdisciplinary in nature essence "ESD requires a learning environment in which interdisciplinary or transdisciplinary learning approaches are facilitated" (QAA and Advance HE, 2021, p. 32). Interdisciplinarity refers to many competencies for sustainable development, in particular, integrated problem-solving competency involves the ability to work effectively in multidisciplinary and interdisciplinary groups. And as one of the teaching practices, collaborative learning is recommended – which involves an "interdisciplinary, international project to create dementia-friendly communities". So, project management skills such as stakeholder engagement, resource allocation, and risk management are essential to coordinate efforts across disciplines and ensure that diverse perspectives are integrated into sustainable solutions.

Collaborative competency. Another link between project management skills and Education for Sustainable Development is the ability to work in a team. Cooperation and teamwork are the pillars of project management. Among the key competencies for sustainability is a collaborative competency, which involves engaging in interdisciplinary discussion to inform their thinking about sustainable futures and seek holistic, creative solutions to problems and facilitate

collaborative and participatory problem solving. Similarly, project management emphasizes effective teamwork and cooperation between different stakeholders, and employees with different skills and experience. The project-oriented learning itself is actively encouraged within ESD, as it allows students to work together on sustainable development projects, reflecting real situations and developing collaborative competence. Besides, the methodology of project management is quite effective for developing the ability of students to recognize the goals, skills and needs of others which is crucial for successful collaboration.

Problem-solving competence. An obvious connection between ESD and project management skills is integrated problem-solving competence. This competence predicts that the student will be able to "combine different sources and types of evidence, drawing from different disciplines, to view and address a problem" (QAA and Advance HE, 2021, p. 29). A project manager also requires good problem-solving skills, which provide tools and techniques to facilitate the implementation of these solutions.

Project management involves continuous monitoring and evaluation to track progress and make necessary adjustments. Evaluation skills are important for ESD, which encourages a reflective process where students can assess the impact of their actions on the goals of sustainable development and accordingly adjust behavioral, consumption, and lifestyle strategies in general. Ethical aspects, which are taken into account when making decisions, are important for ESD and project management as well. Ethical decisions are important in project management to ensure that projects are executed with integrity and respect for stakeholders. ESD promotes ethical behavior by encouraging students to consider the social, environmental and economic consequences of their actions.

In essence, project management skills provide a structured approach to implementing the principles of ESD. It helps ensure that sustainable development initiatives are effectively planned, executed, monitored, and evaluated, ultimately contributing to the achievement of sustainable goals and positive societal outcomes.

4. HOW ARE PROJECT MANAGEMENT SKILLS REPRESENTED IN THE UKRAINIAN LANDSCAPE OF HIGHER EDUCATION

An analysis of the Ukrainian academic standards of higher education for the master's level (Ministry of Education and Science of Ukraine, n.d.) was carried out to understand to what extent project management competencies are represented in the programmes implemented in Ukrainian higher education. This approach was chosen due to two key reasons, such as 1) Academic standards of higher education in Ukraine are mandatory for higher education institutions to develop their study programmes, and 2) higher education institutions very rarely change the programme learning outcomes, although they have such a right. The Ministry's academic standards for higher education in Ukraine include generic competencies, and subject-specific competencies, based on which programme learning outcomes are defined. Following the regulations of the Ukrainian Ministry of Education and Science, higher education institutions may add and change the wording of subject-specific skills and/or program learning outcomes but ensure that students have acquired the competencies defined in the Ministry's academic standard.

Therefore, the content analysis of the Ministry's academic standards is representative of generalization and understanding of what extent these competencies are displayed in the landscape

of Ukrainian higher education. The overall result confirms the Ministry of Education and Science recognizes the importance of project management skills for various specialties, including health care, military sciences, and law.

We compared the project management skills and other management competencies, as shown in Figure 2, time-management, strategic management, technological management and team management. The project management skills are the most in demand. In general, 38% of the entire cohort of standards contain project management skills (38 from 101 academic standards). While the other ones are represented very poorly. Strategic management skills are included in just 8 % of academic standards, and team management skills are only represented in 3 academic standards. An important aspect of the Ukrainian academic standards' analysis is the fact that project management skills are represented mostly in the fields of study that are traditionally associated with arts and humanities. Three out of five academic standards in the Humanities contain project management skills, one contains the ability to manage work or learning processes in the field.

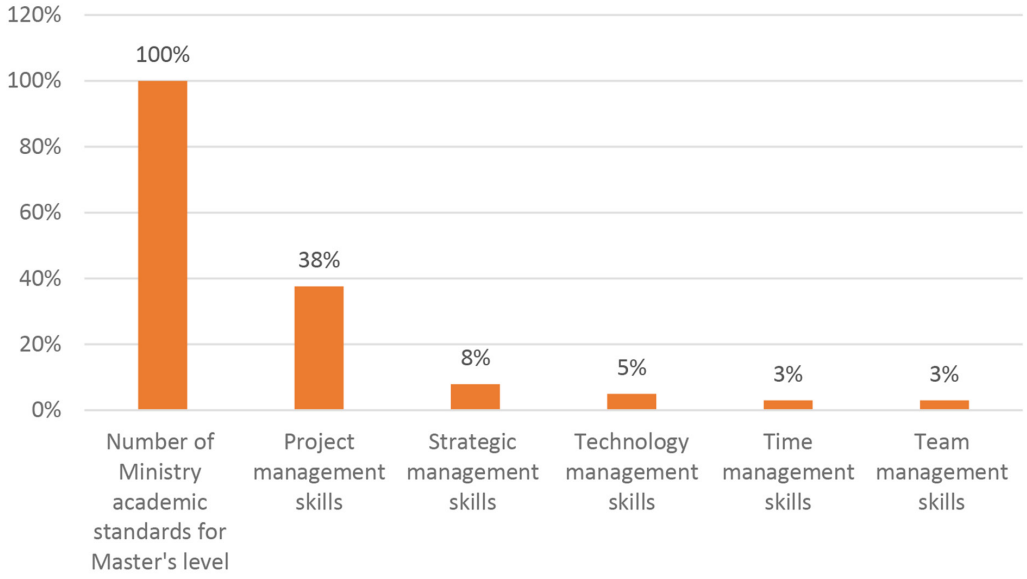

Figure 2. The project management skills and other management competencies in the academic standards of the Ministry of Education and Science

Source: Own calculations

A similar case is the in social and behavioral sciences. In this field of study 3 out of 5 academic standards contain management competencies, particularly project management skills. The field of study Agricultural Sciences and Food represents 5 out of 8 academic standards which contain project management skills. So, we see that project management skills are recognized as relevant for non-management majors. However, implementing project management skills in non-managerial academic programmes is quite complicated. Analysis of the academic standards revealed some inconsistencies, namely, most of the standards contain relevant generic competencies (23 out of 38) but have not been reflected in relevant programme learning outcomes, which depict project management skills. Just 8 academic standards contain programme learning outcomes related to project management. Since program learning outcomes in ministerial academic programmes under the specialty, there are significant risks that the principle of the constructive agreement will not be met. That is, the learning, teaching and assessment methods do not take into account the presence of project management competencies, as they are lost in the programme learning outcomes.

5. FUTURE RESEARCH DIRECTIONS

Despite plenty of research on sustainability implementation in the principles and practice of project management, the issue of how project management competencies correlate with key competencies for sustainability is still discursive. How does the development of project management competencies among students contribute to the development of their knowledge and skills about SD?

The limitation of this study is that the conclusions regarding the representation of competencies and programme learning outcomes in the landscape of higher education in Ukraine are developed based on the standards of the Ministry of Education and Science of Ukraine (n.d.). The next stage of research on this issue should be an analysis of the content of educational programs, as well as a survey of students about their learning experience and development. An important aspect is the development of an internal institutional vision regarding ESD.

The issue of how teaching, learning and assessment of components in academic programmes should be developed and delivered to make it possible to align these competencies with sustainability competencies needs to be researched. Guraziu (2023) concluded that the project-based approach promotes critical thinking and critical reflection, develops students' ability to recontextualize practice in the educational environment as well as enhances collaboration and teamwork. It would be highly beneficial for HEIs to integrate project management as an integral module in academic programmes given the importance of project management skills. Teaching project management goes beyond all disciplines and is not limited to specific subject areas.

6. CONCLUSION

Although the project management competencies in the academic standards of the master's level in Ukraine are broadly represented (mostly as general competencies), programme learning outcomes limit the implementation of this element in academic programs of a non-managerial profile. Such a situation creates path dependence when the lack of practice and experience in embedding project management elements into non-managerial and institutional policy programs in this regard limits the implementation of an effective approach.

We believe that it would be highly beneficial in terms of students' experiences for institutions to review the programme learning outcomes, as well as the formation of an institutional strategy for the development of sustainability competencies, and involvement of the stakeholders as actors. Mentoring and peer-to-peer learning could be effective tools for ESD and PM skills development. Peer learning groups where senior students can guide non-management students in developing project management skills. The mentorship can provide valuable guidance, feedforward, and feedback throughout project-based learning.

Therefore, higher education must find a combination of approaches and methodologies to teaching, learning and assessment to enable the development of key sustainability competencies.

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