

Abstract

This paper presents a review of the literature on core competencies for Education for Sustainable Development (ESD) and the role of higher education institutions in developing those competencies in their students. The critical role of higher education in contributing to sustainable development has long been recognized by the global community, namely in Chapter 36 of Agenda 21 (UN, 1992), the Decade of Education for Sustainable Development (2005–2014) and Goal 4 of the Sustainable Development Goals (UN, 2015). Particularly, the main focus of Sustainable Development Goal # 4 is to guarantee inclusive and equitable quality education and promote lifelong learning opportunities for all.

Unfortunately, this goal may not be achieved by simply increasing basic literacy. Undeniably, if the world wants to make progress towards sustainability goals, basic education of the countries must be redesigned to address sustainability by re-examining their educational policies and practices to align with the development of the knowledge and competencies related to sustainability. Although multiple definitions of competency exist, this paper is more in line with the definition provided by the European Parliament Council (2009). European Parliament Council defines competency as "proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations" (EC, 2009, 14). Some of these competencies for sustainable development include skills for creative and critical thinking, oral and written communication, collaboration and cooperation, conflict management, decision-making, problem-solving and planning (Stoltenberg, 2007). Sterling and Thomas (2006) also emphasize the importance of acquiring a sustainable development mindset through "a much more critical and interactive pedagogy than usually found in universities" (352).

Azerbaijan has not moved towards market-oriented education system despite attempting to integrate to the European Higher Education Area (Tempus, 2012). The current education system does not arm students with key competencies such as critical thinking as there is a discrepancy between what higher education provides and the labor market demands. Thus, the purpose of this review was to explore the successful practices of higher education institutions in different countries which adopt an ESD approach and prepare students well with adequate skills and/or competencies relevant for today's workplace. A comprehensive synthesis and critical analysis of the research and practice related literature provides an overview of models, practices, guidelines, challenges and ways to implement them. This paper seeks to answer what is the role of higher education institutions in shaping the future of the world society in terms of sustainable development by generating new knowledge as well as contributing to the development of appropriate competencies and raising sustainability awareness. Finally, implications for practice in Azerbaijan's education system context is discussed and a future research agenda is proposed.

Keywords: Sustainable development, Key competencies, Higher education, ESD

Introduction

To start by providing background information about the history of Education for Sustainable Development (ESD), it is noteworthy that higher education institutions (HEIs) have taken measures to make contributions to sustainable development (SD) since the UN Conference on the Human Environment in 1972 (Amaral, Martins and Gouveia, 2015). The United Nations Economic Commission for Europe (UNECE) recognized the significance of education in a sustainable world, namely in Chapter 36 of Agenda 21 (UN, 1992), the United Nations Decade of Education for Sustainable Development (UN DESD, 2005–2014) and Goal #4 of the Sustainable Development Goals (UN, 2015). UNECE supports the countries to achieve Sustainable Development Goals (SDGs). The representatives of member states of the UNECE region adopted the 10-year Strategy on Education for Sustainable Development in Vilnius in 2005 that led to the implementation of the UN DESD (UN, 2016). This strategy mainly aims to motivate the governments to create policies, provide academics staff with ESD competences and promote research and development concerning ESD.

The main aim of Education for Sustainable Development (ESD) in higher education (HE) is to enable graduates to develop "competences in systemic, anticipatory, and critical thinking and handling of complexity" (Rieckmann, 2012). Rieckmann (2012) defines competences as "individual dispositions to self-organization which include cognitive, affective, volitional (with deliberate intention) and motivational elements; they are an interplay of knowledge, capacities and skills, motives and affective dispositions" (p. 5). Rieckmann (2012) states that the development of critical competencies can be facilitated through applying interdisciplinary and transdisciplinarity, participation and collaboration and problem-orientation at HEIs and adaptation of HEIs to regional and cultural differences.

Overall, the authors of this paper primarily analyze the experience of different countries which adopt an ESD approach, the Azerbaijani context, and what we believe must be taken into consideration in order to successfully implement an ESD approach in Azerbaijani higher education system. Due to the emerging nature of the topic and availability of public information, our list of interventions is by no means exhaustive. The focus was made to draw from the experiences of countries who have a similar culture/environment to Azerbaijan. The subsequent sections of the paper focus on the theoretical framework and conceptual frameworks that have informed this literature review, findings from the implementation of ESD principles in different countries, the best practices for Azerbaijani context and conclude with a discussion of the implications and recommendations for action and future research.

Theoretical and Conceptual Framework

The theoretical framework that informed our study was inspired by Vygotski's (1964) social constructivism theory. The central premise of this theory is that it views the learner as a unique individual with particular needs/culture/values. This theory does not only acknowledge this exclusiveness of each learner, but it also encourages to keep this in mind and utilize interventions accordingly to meet those unique needs. Echoing Bauersfeld (1995), in this case, there is also a big responsibility on instructors' shoulders because they now need to adopt the role of facilitators rather than teachers: instead of having one-way communication and lecturing the subject matter, the facilitators in competency-based higher education environments should help the learners to have their understanding of the content based on his/her background and acquire relevant competencies that were mutually agreed upon while designing the curricula (Gamoran, Secada, & Marrett, 2000).

Another primary rationale behind choosing social constructivism theory as the main theoretical framework was its approach towards the context of learning. According to the social constructivist view, the context in which the learning takes place is critical (McMahon 1997): Decontextualised knowledge does not prepare students to apply the competencies when they start their careers and need to apply those competencies to real-life tasks.

As a conceptual framework, this study found the model presented by Kouwenhoven (2003) as the most relevant to the ideology of the researchers informed by an extensive literature review. Considering the word limit of the paper, the authors will not focus on explaining this model in detail but will focus more on explaining it comprehensively during the presentation. To have a general understanding of the model, according to Kouwenhoven (2003), the development of a competency-based curriculum should follow these steps: (1) formulation of a professional profile with major competencies that have been mutually decided upon between higher education institutions and employers, (2) graduate profile with those competencies that match with the ones of the professional profile, (3) core competencies should include both domain-specific and generic competencies, and (4) finally, both teaching and assessment of the students should focus on integrating knowledge, skills, and attitudes. The model for competency-based curriculum development is given in Figure 1.

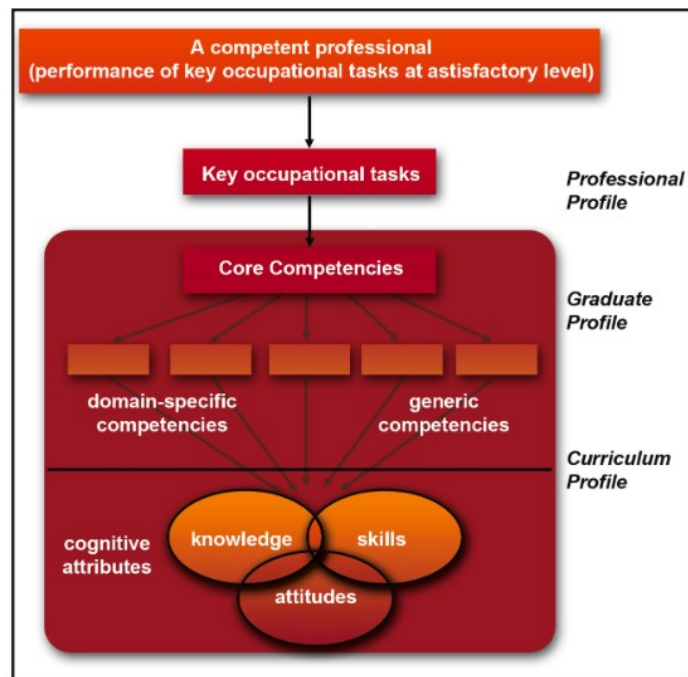


Figure 1: The relation between competence, core competencies and constituting domain specific and generic competencies (Kouwenhoven, 2003).

Methodology

To accomplish the purpose of this study, this paper presents an integrative review of the literature on competency-based education and Education for Sustainable development. The literature review was conducted using online databases available at the George Washington University's Gelman library, namely EBSCO, ERIC, Academic Search Complete, Business Source Complete, PsychInfo, SocINDEX, and also, Google Scholar. The search was conducted using the following search terms in the title or abstract or keywords (subject terms) of peer-reviewed publications: competenc*, competenc* based education, education for sustainable development, higher education, and their combination. The review spanned a variety of disciplines and fields of study including education, human resource development, psychology, cognitive science, and economics.

This search with the previously mentioned keywords in those databases resulted in 260 peer-reviewed articles and reports. An initial quick review of the articles was conducted in order to narrow this number down by reviewing abstracts of those papers. The studies which focused on children as its main audience or education of anybody under 18 were excluded as a result of this review because this paper focuses on higher education. Excluding the articles based on the mentioned criteria led to the selection of 67 articles for in-depth analysis. Besides, the references of the relevant articles also helped to have access to other appropriate articles and review them in depth.

Discussion of Findings

Practices from Central and Eastern European countries

The HEIs play a critical role in the development of key competencies which require "reorientation of the learning process" (Barth, Godemann, Rieckmann and Stoltenberg, 2007). A learning process can be changed based on "competence-orientation, societal orientation and individual centering" (Barth et al., 2007, p.419). Competence-orientation helps to attain key competences and identify learning opportunities (Barth et al., 2007). On the other hand, societal orientation means that individuals can learn through real-life situations (Barth et al., 2007). On the one hand, individual centering refers to the settings for learning that exist beyond traditional or "formal" ones (Barth et al., 2007).

Dlouhá, Vintar Mally and Dlouhý (2017) argue that SD principles do not make any systemic and practical impact on the HE curricula or in practice because of formality of them. Therefore, the Eastern countries lack best practices such as "using action learning, critical reflection, participatory learning, transformative pedagogy, mentoring systems, professional communities of learning and other innovative approaches enriching the practice of HE teaching

in other parts of Europe" (Dlouhá et al., 2017, p.831). The introduction of the National Qualifications Framework for Higher Education (NQF-HER) has played a vital role in sustainable development in Turkish higher education (Katayama, Örnektekin and Demir, 2017). The NQF-HER mainly highlights the importance of raising sufficient awareness about "the issues of the universality of social rights, social justice, quality, cultural values and environmental protection, worker's health, and security" for the students (Katayama et al., 2017, p. 3). Besides, Turkish HEIs build international partnerships to achieve sustainable development goals in HE. However, in Turkey, Bosnia, and Herzegovina and Croatia, ESD is mainly preferred as having courses on environmental education and protection (Dlouhá et al., 2017; Katayama, Örnektekin and Demir, 2017). Additionally, in Turkey, as the design of programs and courses are directly influenced by the political context of HE that is "constructed on solid modernity", most of the HEIs offer similar courses and programs (Katayama et al., 2017, p. 12).

Only the Czech Republic and Slovakia adopted a national strategy recognizing the ESD in HE (Dlouhá et al., 2017). They also highlight that Bosnia and Herzegovina integrated ESD elements to legislation regulating agriculture, forestry, water, energy, regional development and nature protection (Dlouhá et al., 2017). Besides, those elements are covered in the National Sustainable Development Strategies of Hungary, Macedonia, Romania, Serbia and Slovakia (Dlouhá et al., 2017). However, they do not have a substantial impact on the HE curricula (Dlouhá et al., 2017).

In 2010, the Estonian Ministry of the Environment adopted an Environmental Education Development Program (Henno, 2016). The main goal of the was "to promote ESD and environmental education as the essential component of sustainable development, to raise student and public environmental awareness and awareness about sustainable development" (Henno,

2016). In ESD implementation, one of the goals is to achieve teacher development through practical training programs on ESD competences in HE (Henno, 2016; Dlouhá, Vintar Mally & Dlouhý, 2017).

Azerbaijani HE system

Since gaining independence, Azerbaijan has paid attention to the development of an educational system following European standards for the recognition of the country in the international arena. In 2005, Azerbaijan joined the Bologna process to integrate into the European Education systems (Ministry of Education, 2016). The Bologna process is often called a revolutionary process which involves cooperation in the European Higher Education Area (EHEA). The Ministers of Education and university leaders of 29 countries launched this process and signed the Bologna declaration in 1999 in order to establish a European Higher Education Area by 2010 ("University Autonomy in Europe", 2009). Azerbaijan has also joined the United Nations Economic Commission for Europe (UNECE) since 1993. It is essential both for the UNECE Strategy for ESD and the Bologna Process to achieve the development of competences of professionals and informed active citizens (Fadeeva and Galkute, 2012). However, "ESD is not widely recognized and referenced in the Bologna Process as an important factor in HE development" (Fadeeva and Galkute, 2012, p.92).

Although Azerbaijan attempts to integrate to the European Higher Education Area, it has not moved towards market-oriented education system (Tempus, 2012). The current education system does not prepare students with key competencies, including critical thinking. Therefore, when students graduate from current higher education institutions, they experience difficulties meeting the requirements of the labor market. Besides, the local context of the current education system was not considered in terms of the establishment of international partnerships and the

implementation of the Bologna principles. Instead, Murshudova (2011) suggests the importance of local partnerships among national HEIs, "This will help to share the best practices of internationalisation efforts among the local institutions and reduce the costs of consultants from abroad" (p. 52).

Implications

The main implication of this study is to help researchers, practitioners, higher education institutions to familiarize themselves with examples from other countries' experiences and to describe Azerbaijani higher education context, and finally, recommend what needs to be considered in Azerbaijani context.

Dlouhá et al., (2017) claim that the development of research and teaching and learning settings and sharing best practices and building cooperation across Europe can improve the implementation of ESD principles in HE. However, it is of great importance to consider the local issues in order to guarantee the successful implementation of the ESD principles (Kitamura, & Hoshii, 2014). Furthermore, as stated by Kouwenhoven (2003), in developing countries many higher education institutions face a mounting gap between their curriculum and the demands of the labor market, especially in terms of general key competencies such as problem-solving, critical thinking, systems thinking, teamwork, and project management. Azerbaijan, as a developing, country experiences a similar situation. There are various potential threats to this initiative such as university rules/regulations, fixed an old education approach based on an assessment of memorization more than the development of those skills, and the centralistic approach to examination. One of the proven ways to deal with this challenge is to include all responsible stakeholders who will be affected by the change on the table and try to come to a collective agreement. Based on the analyzed countries' experiences, we can say that the problem

is that the transition to competence-based education for sustainable development happens in silos. To be more specific, higher education institutions decide on those competencies and design the curriculum by analyzing the best practices of countries who have successfully implemented it without paying attention to local factors. So, what we recommend in our analysis is that there should be a partnership between educators and employers in identifying the main competencies. At the end of the day, if the main goal is to prepare students with necessary competencies to be successful at the workplace, input from those employers is critical.

Finally, a critical analysis of the literature helped the researchers to realize that the most of the literature on this topic focuses on defining competencies, emphasizing the importance of ESD approach, showing its application, but there is a lack of literature which pays attention to preparing educators accordingly. Therefore, as another implication, this paper argues that it is critical to assist those educators to own this mindset first, provide intensive training and coaching to them, and support them in this transition process in the continuous evaluation of the curriculum and making necessary adjustments.

Conclusion, Limitations, and Future Research Agenda

This paper examined the literature on Education for sustainable development (ESD) and competency-based education to provide a comprehensive synthesis and critical analysis of the published research, draw implications for practice, and propose a research agenda.

A few limitations of this study are worth noting. First of all, the research process may have led to the elimination of some critical articles. A majority of studies and experiments described the Western world. Since different cultures have various attitudes towards education informed by their core values and various types of local contexts, a review of the studies conducted in different cultures could have brought a new cultural perspective to the topic. This is further

exemplified by the fact that all the literature reviewed was in English, thus potentially missing the points presented in publications in other languages. Also, the literature review revealed a significant number of mainly conceptual papers on this topic, but few empirical studies explored or tested the conceptual ideas related to this topic.

Thus, as a direction for future studies, there is a need for more empirical research to understand what kind of process countries go through to implement competency-based higher education which will lead to sustainable development and will meet the requirements of the organizations, and what factors help or hinder this process.

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The Critical Role Of Competence-based Education for Sustainable Development: An Integrative Literature Review



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Agenda



- Introduction: Research Background, Purpose, and Question
- Theoretical and Conceptual Framework
- Methodology
- Findings
- Implications
- Conclusion, Limitations, and Future Research Agenda

Education for Sustainable Development (ESD) and competence-based education



- **What ESD means?**

- ESD in higher education (HE) is about enabling graduates to develop "competences in systemic, anticipatory, and critical thinking and handling of complexity."

- **What Competence means:**

- An interplay of knowledge, capacities and skills, motives and affective dispositions" (Rieckmann, 2012, p. 5).

- A proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations" (European Parliament Council, 2009).

Rationale

- Chapter 36 of Agenda 21 (UN, 1992), the Decade of Education for Sustainable Development (2005–2014) and Goal 4 of the Sustainable Development Goals (UN, 2015) recognize the role of HE in contributing to sustainable development
- The main focus of Sustainable Development Goal # 4 is to guarantee inclusive and equitable quality education and **promote lifelong learning opportunities** for all.
- This goal may not be achieved by simply increasing basic literacy. If the world wants to make progress towards sustainability goals, countries should re-examine their educational policies and practices to align with **the development of the knowledge and competencies related to sustainability.**
- The current education system in Azerbaijan does not arm students with key competencies.

Research purpose and question



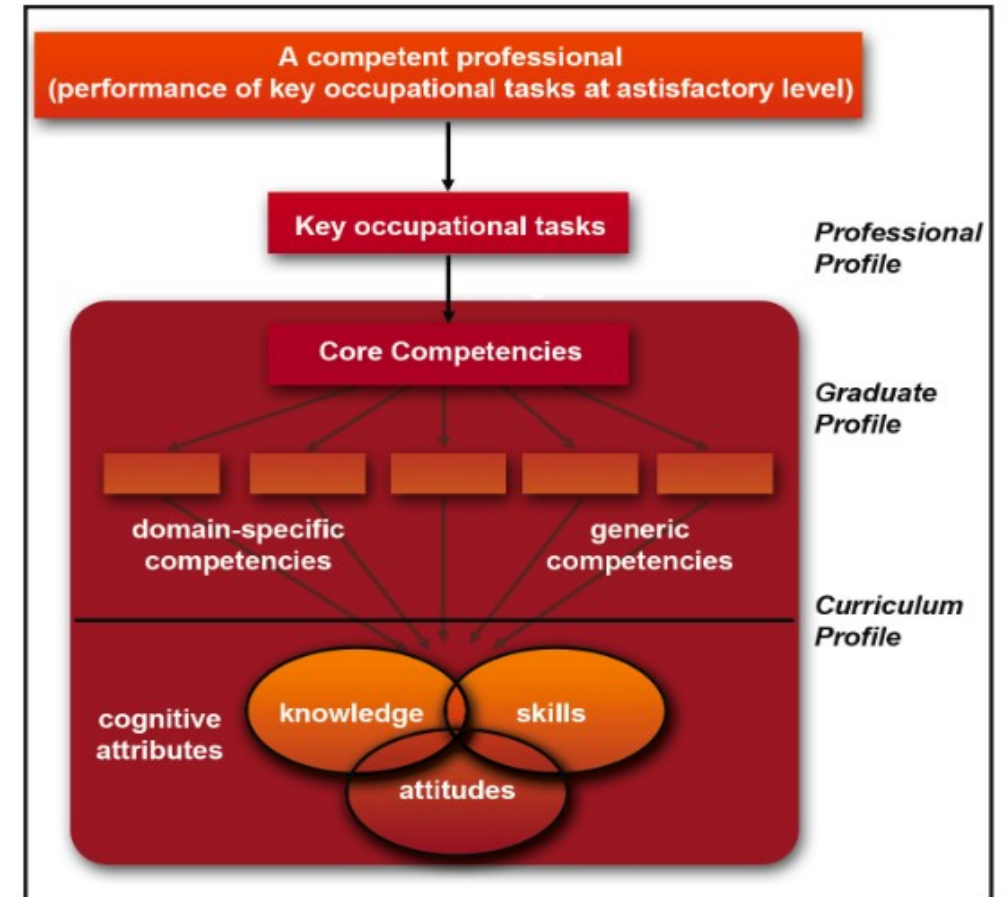
- **Research purpose:** This study aims to analyze the experience of different countries which adopt an Education for Sustainable Development (ESD) approach, the Azerbaijani context, and what we believe must be taken into consideration in order to successfully implement an ESD approach in Azerbaijani higher education system.
- **Research Question:** What is the role of higher education institutions in shaping the future of the world society in terms of sustainable development by generating new knowledge as well as contributing to the development of appropriate competencies and raising sustainability awareness?

Theoretical and Conceptual Framework



Vygotski's (1964) Social Constructivism Theory:

- The learner as a unique individual with particular needs/culture/values.
- Instructors should adopt the role of facilitators rather than teachers.
- The context in which the learning takes place is critical.





Methodology

- Online databases available at the George Washington University's Gelman Library
 - EBSCO, ERIC, Academic Search Complete, Business Source Complete, PsychInfo, SocINDEX, and also, Google Scholar.
- Search terms in the title or abstract or keywords of peer-reviewed publications: competenc*, competenc* based education, education for sustainable development, higher education, and their combination.
- The review spanned a variety of disciplines and fields of study including education, human resource development, psychology, cognitive science, and economics.

Findings

Practices from Central and Eastern European countries:

- The Czech Republic and Slovakia adopted a national strategy recognizing the ESD in HE (Dlouhá et al., 2017).
- Bosnia and Herzegovina integrated ESD elements to legislation regulating agriculture, forestry, water, energy, regional development and nature protection (Dlouhá et al., 2017).
- Hungary, Macedonia, Romania, Serbia and Slovakia covered ESD elements in the National Sustainable Development Strategies (Dlouhá et al., 2017).
- Estonia adopted an "Environmental Education Development Program" (Henno, 2016).



Findings (cont.)

Azerbaijani Higher Education (HE) system:

- In 2005, Azerbaijan joined the Bologna process to integrate into the European Education systems (Ministry of Education, 2009).
- Azerbaijan has also joined the United Nations Economic Commission for Europe (UNECE) since 1993.

Dlouhá, Vintar Mally and Dlouhý (2017) argue that SD principles do not make any systemic and practical impact on the HE curricula or in practice because of formality of them.



Implications

- It is critical for researchers, practitioners, higher education institutions to keep in mind a few critical things mentioned below:
 - It is of great importance to consider the local issues in order to guarantee the successful implementation of the ESD principles.
 - It is equally significant to include all responsible stakeholders who will be affected by the change on the table and try to come to a collective agreement.
 - Finally, it is critical to prepare and train educators accordingly.

Limitations and Future Research Agenda



Limitation:

- Limited search strategy that was focused on the Western literature.
- Review of the literature available only in Azerbaijani and English languages
- Review of mostly conceptual papers.

Future Directions:

- Review more research that discuss other perspectives, and available in various languages if researchers have a knowledge of those languages.
- There is also a need for more empirical research.

Questions?



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