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To cite this article:

Melliou, K. & Retalis, S. (2024). Exploring the connection between “Out of Eden Learn” and competency-based education. *International Journal on Studies in Education (IJONSE)*, 6(1), 160-176. <https://doi.org/10.46328/ijonse.196>

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Exploring the Connection between “Out of Eden Learn” and Competency-based Education

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Article Info

Article History

Received:

23 June 2023

Accepted:

12 December 2023

Keywords

Competency-based education

Out of Eden Learn

Curriculum design

Thinking routines

Abstract

Competency-based education represents an important priority for several countries worldwide. Although national governments and international education communities have identified a wide range of competencies as integral for meeting 21st century learning requirements there is a lack of evidence on how can these be effectively taught, learnt, and assessed in the classroom. A promising approach for competency-based education is “Out of Eden Learn”, a research initiative of Project Zero at the Harvard Graduate School of Education that incorporates several strategies such as thinking routines and dialogue tools that are carefully crafted to facilitate the development of core competencies among learners. This study looks at the “Skills Labs” competency-based educational reform in Greece and presents the process of using “Out of Eden Learn” to develop a curriculum that is both supportive of fostering the requisite competencies and responsive to the needs of primary teachers. A survey questionnaire was used to investigate the views of 120 teachers who piloted the curriculum in 82 kindergarten and elementary schools across Greece. The findings not only reveal the value of “Out of Eden Learn” approach for competency-based education, but they also indicate the interdisciplinarity and the transferability of its related strategies that can guide curriculum design and teaching practice in an array of international educational contexts.

Introduction

The challenges that characterize our complex world call for a generation of learners who acquire and employ the competencies needed for effective problem solving, participation, and personal fulfilment. Whereas competency-based education represents a positive step toward meeting 21st Century learning requirements, effective implementation faces several challenges mainly due to the lack of (a) school curricula responsive to the learning needs of a fast changing world (OECD, 2020b) and (b) relevant instructional approaches and educational tools that can guide implementation of competency-based teaching and learning in authentic contexts like classrooms and digital platforms (Boix-Mansilla & Schleicher, 2022).

The Greek Ministry of Education launched the “Skills Labs” project in an attempt to reform curricula and offer a competency-oriented shift in teaching and learning in compulsory education (Institute of Educational Policy, n.d.).

The project visits new thematic areas to promote competencies in primary and lower secondary education that are considered integral for 21st Century education. The Ministry has suggested a competency-based framework to facilitate the introduction of new topics in the national curriculum that enhance the acquisition of four (4) clusters of core competencies that comprise these four (4) thematic pillars: Well Being, Environment, Social Conscience and Responsibility, and Innovation (see Figure 1).

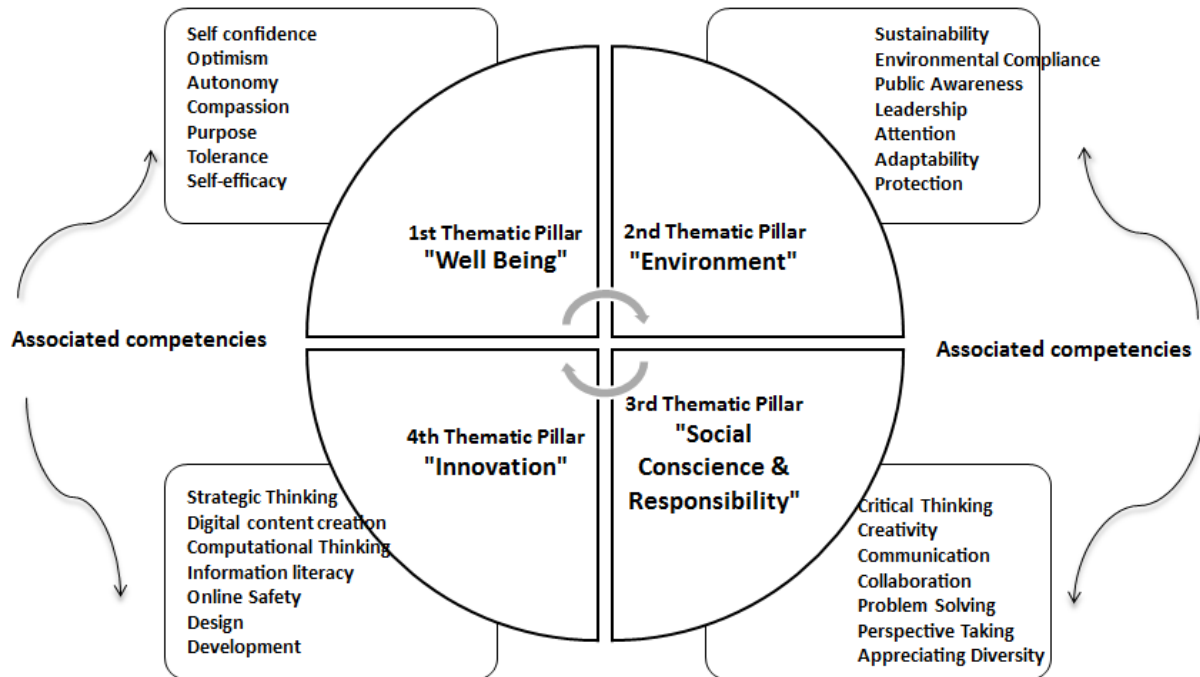


Figure 1. The Thematic Pillars and Associated Clusters of Competencies of the “Skills Labs” Framework

The Ministry invited several stakeholders including universities, NGOs, intergovernmental organizations and local authorities to contribute by recommending innovative programs and relevant curriculum materials that are aligned with the content of the proposed thematic pillars and that have also been tested in classroom settings with a positive impact on competency-based education. Each stakeholder was invited to suggest an existing program for one of the four thematic pillars and then consider necessary curriculum adaptations to meet the following requirements:

- a. It shows relevance between the “Skills Labs” framework and the clusters of competencies associated with the selected thematic pillar.
- b. It emphasizes the use of appropriate competency-based pedagogical approaches for primary or lower secondary education.
- c. It offers a selection of competency-based assessment methods.
- d. It allows seven weeks to work through the program’s learning activities and material.

Having undertaken a range of initiatives in this area, the authors – an educational coordinator and a university professor – suggested Out of Eden Learn (OOEL), a research program of Project Zero at the Harvard Graduate School of Education. Through OOEL, students demonstrate higher-level competencies as they investigate contemporary global issues, share their perspectives, and interact with one another (Tishman, 2018).

This study aims to explore OOEL's potential in implementing competency-based education and to present the opportunities and challenges involved in adapting the existing curriculum to be supportive of fostering the requisite competencies of the "Skills Labs" framework and responsive to the needs of primary teachers. The study additionally aims to offer new insights into the implications of employing OOEL approach and strategies in the process of teaching, learning and assessment of core competencies because the existing literature has been mainly centered on assessing its contribution in promoting intercultural understanding and the capacity to engage in meaningful cross-cultural encounters (Out of Eden Learn, 2016).

Out of Eden Learn

OOEL is a free online program for students aged 3-19 that has so far served over 40,000 students in 63 countries (Out Of Eden Learn, n.d.). It began in 2013 as an experimental collaboration with the Pulitzer Prize-winning journalist and National Geographic Fellow Paul Salopek -who is currently engaged in a 21,000-mile walk on foot- and has evolved into a promising curriculum for promoting thoughtful, cross-cultural inquiry and exchange, drawing inspiration from the ways in which Salopek interweaves "slow journalism" with local and global storytelling.

The Out of Eden Learn Principles

The OOEL curriculum (Out of Eden Learn, 2016) is shaped by three guiding principles that invite learners to

- slow down to observe the world carefully and to listen attentively to others;
- exchange stories and perspectives about people, place, and identity; and
- reflect on how their own lives connect to bigger human stories.

The background of the OOEL principles is quite relevant to Project Zero's dispositional conception of thinking and learning that treats competence as a dynamic process that goes beyond a skills-centered view by including ongoing dispositions that guide students' intellectual performance in concrete situations (Tishman et al., 1993). Students are motivated to deploy several skills and dispositions as they engage in the OOEL curriculum that is comprised of a sequence of discrete learning activities which are called "footsteps". Each footprint begins by inviting students to investigate specific learning resources. The second part of each footprint asks students to mimic some of what Paul Salopek is doing in his journey but on a local scale. The final part involves student-to-student communication and thoughtful exchanges with peers from different backgrounds (Dawes Duraisingh, 2016). OOEL incorporates several strategies toward achieving the learning goals of each footprint, such as thinking routines and dialogue tools that suggest simple protocols for responding effectively to specific contexts and situations that are important for competency-based education.

The Out of Eden Learn Strategies

Competencies, are formed when people routinely engage in specific patterns of behaviour using explicit and accessible strategies across contexts and curricular areas' disciplines (Boix-Mansilla, 2016). Drawing on Project Zero's long-standing research, OOEL suggests a set of competency-based strategies that include thinking routines

and dialogue tools.

Thinking routines are simple patterns of thinking that can be used repeatedly and folded easily into learning in the subject areas (Ritchhart & Perkins, 2008). They typically consist of a series of questions that teachers ask students to lead them through the steps of critical thinking and to help them exhibit different thinking skills. In addition, these routines, meant to be used frequently and across content, mobilize students' relevant knowledge, skills, attitudes and dispositions and become essential contributors to making their competencies more visible and transparent (Ritchhart, 2015).

Similar to thinking routines is the use of OOEL's dialogue tools (Figure 2). The dialogue toolkit is a set of lean structures that serve as writing prompts or sentence starters and aim to slow down the process of responding and exchanging ideas with peers by highlighting specific moves that students can use in their comments (James & Sloan, 2014). Students are invited throughout the OOEL footsteps to think more deeply about their responses to other students' work either by "Noticing" details, describing "Connections", "Probing" with thoughtful questions, "Snipping" thoughts that are interesting, sharing how ideas have been "Extended" in new directions, "Naming" the aspects of their identity, "Challenging" a "Point Of View" someone else has shared and "Appreciating" the value of diverse perspectives (Wilson, 2020).

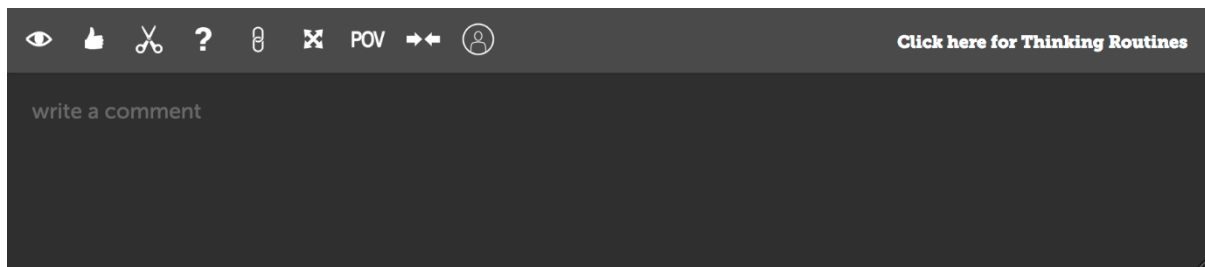


Figure 2. The Dialogue Toolkit

The use of the OOEL strategies goes beyond merely infusing opportunities for fostering competencies into the curriculum. Their explicit and goal-driven nature can also serve as a context for assessing competencies in terms of uncovering and describing the epistemic moves that compose a competence (Ritchhart et al., 2011). For instance, to obtain an understanding of learners' progress in the development of critical thinking, the "Claim-Support-Question" routine suggests three key moves (a) identify a claim, (b) articulate the supporting evidence, and (c) consider what might make one hesitant about the truth or accuracy of the claim (Ritchhart et al., 2011). This way, both teachers and students are aware in advance about the learning outcomes that are going to assess or to be assessed, an aspect that offers transparency to the assessment procedure and is considered very important in competency-based education (Council of Europe, 2018).

The Adaptation of the OOEL Curriculum Process

Given that OOEL provides a consistent structure for competency-based education the authors (also referred as researchers) submitted the related curriculum and after it was approved by the Greek Ministry of Education

committee continued with the adaptation process.

According to the requirements set out by the “Skills Labs” framework adaptation of the existing OOEL curriculum should focus on: (a) ensuring coherence with the content of the selected thematic pillar and the development of the relevant clusters of competencies and (b) taking decisions about the OOEL elements to be included in the pilot curriculum that promote competency-based teaching and learning.

The research team’s first step was to review the content of the Skills Labs’ thematic pillars and to dig deeper into the embedded clusters of competencies. This process led to the selection of the “Social Conscience and Responsibility” pillar that was associated with these seven (7) competencies: (a) critical thinking, (b) creativity, (c) communication, (d) collaboration, (e) problem solving, (f) perspective taking, and (g) appreciating diversity. The construction of the clusters of competencies proposed for each thematic pillar of the Skills Labs framework was organized at the national level. However, the framework did not contain any specific information for the competency-based teaching, learning and assessment activities. Therefore, it was important for the researchers to “translate” the content of the selected thematic pillar and the development of the associated seven (7) competencies into instruction and learning activities within the existing OOEL curriculum and approach.

The authors identified five aspects of the “Skills Labs” framework that were used to conceptualize the process of adapting the pilot OOEL curriculum:

- i. Competencies have a dispositional nature: Considering dispositions as having high relevance to performances as observable outcomes was the venue for centering the pilot curriculum objectives on how learners are disposed to “perform” rather than mainly focusing on what they are expected to “know” (OECD, 2020a). Accordingly, the three OOEL learning principles reflected across different parts of the pilot curriculum ensured that competent performances are related to ongoing dispositions (Salmon, Gangotena, & Melliou, 2018).
- ii. Competencies are cross-curricular and demonstrated in different subject areas: The competencies associated with the selected thematic pillar are not necessarily linked with specific curriculum subjects but are best developed within disciplinary contexts. The existing OOEL footsteps are also organized in terms of key cross-curricular competencies that are expected to cross the boundaries of curriculum subjects.
- iii. Competencies express observable outcomes: The research team identified resonances between the accurate communication of the outcomes of competencies and the instructional strategy of “modeling” which is central to the design of the existing OOEL curriculum that is inspired by the strong resonance between Paul Salopek’s unique storytelling approach and the learning activities students are assigned to complete within each footprint. The final edition of the OOEL pilot curriculum consisted of three learning footsteps that teachers would first complete individually, next model and try with students and then reflect regarding the outcomes of competencies development.
- iv. Competencies are developed through appropriate tools crafted to achieve specific ends: Offering learners opportunities to engage in thoughtful exchanges, to collaborate and to develop the ability to empathize and take perspective was among the targeted competencies of the “Social Conscience and

Responsibility” thematic pillar and the OOEL dialogue tools considered to be an appropriate and effective response to the demands of cultivating them in the classroom. Thinking routines were also identified to be completely aligned with the development of competencies such as critical thinking and problem solving.

- v. Assessment of competencies should provide evidence of performance and proficiency: Among the assessment methods suggested by the “Skills Labs” framework the research team decided to use portfolio. The major driver for the use of portfolio assessment was the connection between the OOEL strategies and the process of reflecting on the evidence of the learners’ mobilization and deployment of competencies. The research team also developed a portfolio analysis tool in the form of an observation checklist adapted by the “Skills Labs” competence descriptors framework to provide clear assessment criteria to determine the overall quality of the learners’ performance.

Research Methodology

Study Design

The study design was informed by design-based research (DBR) methods. DBR methods focus on designing and exploring the whole range of designed innovations: artifacts as well as less concrete aspects such as curricula and specific interventions that can contribute to theories of learning and teaching (The Design-Based Research Collective, 2003).

The methods of the study respond to the following DBR characteristics (Dawes Duraisingh & Sachdeva, 2021; The Design-Based Research Collective, 2003): (a) the theoretical principles of the “Skills Labs” framework and the OOEL approach drive the adaptation and design of the pilot competency-based curriculum, (b) the intervention takes place in authentic settings through a cycle of designing the curriculum according the content of the selected thematic pillar and associated competencies, practicing the design with primary teachers, assessing their views, identifying opportunities and challenges that can guide further refinement and improvement, and (c) the intervention reflects an emphasis to understanding the relationships among competency based education framework, adapted OOEL curriculum, and practice.

The research questions that guided the study accordingly were the following:

- a. To what extent could OOEL pilot curriculum be useful for promoting the clusters of competencies of the 3rd thematic pillar among primary students?
- b. What specific elements of the OOEL approach and related strategies that were used to conduct the adaptation process and design are aligned to the “Skills Labs” framework?
- c. What are the gains for participants’ competency-based teaching practice in primary classrooms, as well as the challenges they encountered?

Participants

Prior to the official “Skills Labs” launch, the authors and the OOEL Co-Directors organized an online,

synchronous kick-off workshop addressed to all primary teachers participating in the “Skills Labs” project to share the philosophy of the OOEL program and to invite them to apply for enrollment in the study group. The educators who agreed to participate were 120 (21.7% males and 78.3% females) of whom 80 (66.7%) were elementary school teachers and 40 (33.3%) kindergarten teachers representing a range of “Rural”, “Semi urban” and “Urban” geographical locations in Greek school districts. Their teaching experience ranged from 1-5 years to 31-35 years. These baseline characteristics appear in Table 1.

Table 1. Baseline Characteristics of the Study Sample

		N	%
Gender	Female	94	78.3%
	Male	26	21.7%
Type of school	Rural	20	16.7%
	Semi-urban	44	36.7%
	Urban	56	46.7%
Grade level	Kindergarten	40	33.3%
	Elementary	80	66.7%
Teaching experience (in years)	1-5	7	5.8%
	6-10	15	12.5%
	11-15	21	17.5%
	16-20	31	25.8%
	21-25	26	21.7%
	26-30	19	15.8%
	31-35	1	0.8%

Given that all teachers were fully aware of what the study involves and were willing to take part in the study, the research team asked them to provide some basic information about their educational context and describe their expectations and concerns. Based on the information received, the research team clustered their classes into groups of similar age and grade level.

The research team worked intensively with the teachers for the seven weeks of the “Skills Labs” implementation on constructing meaningful learning opportunities to test the value of the designed OOEL pilot curriculum in practice. The teachers of each group met weekly to reflect on their teaching practices, look closely at selected evidence from students’ portfolios and engage in conversations facilitated by the research team. In addition to their weekly meetings, the teachers participated in three online synchronous workshops led by Project Zero’s Principal Investigators, to deepen their understanding of the OOEL approach and gain a better sense of its relation to competency-based education.

Data Collection

The researchers constructed a questionnaire that consisted of three sections related to the study’s research

questions. In the first and second section there were Likert scale closed-ended questions investigating participants' views about the potential of the pilot curriculum in fostering the proposed seven competencies and the alignment of the OOEL approach and related strategies with the "Skills Labs" framework.

In the third section participants were asked to share their opinions through open-ended questions about specific elements of the pilot curriculum they considered effective for competency-based education as well as the different types of challenges they faced during this learning experience. In order to ensure validity of the content and to avoid problematic structures in survey questions and breakdowns in the question-answering process, the authors asked the OOEL Co-Directors to review the questionnaire before it was sent to participants. In line with their views, some questions were removed from the questionnaire and certain adjustments were made.

Findings

Data Analysis

The findings distilled from the questionnaire are presented according to the order of the research questions. All replies are described using frequencies and percentages. The differences in the replies based on gender, school type, grade level, and teaching experience were examined using the Pearson chi square test or the Fisher's exact test when assumptions were not met. The associations to the extent that the OOEL pilot curriculum aligns to the "Skills Labs" framework were examined with the Somer's d statistic. Binary logistic regression analysis was applied to assess the adjusted effects of school type, gender and grade level on the binary recoded replies to "critical thinking" and "problem solving". The analysis was carried out using the SPSS v 26.0 software and significance was set at 0.05 in all cases.

The researchers additionally consulted feedback from participants that was documented during the study groups meetings with particular attention paid to aspects that could improve curriculum design and competency-based educational practice. Regarding the first question, the OOEL pilot curriculum appeared to be very useful in promoting the proposed competencies of the selected thematic pillar. As shown in Table 2, concerning participants' views in all items the vast majority (90%) stated they believe the OOEL curriculum to be "Quite" or "Very" useful with an only exception regarding the competence of "perspective taking" where 16.7% answered "Somewhat useful". In almost all items the percentage of "Very useful" exceeded 50%. The recorded value of the OOEL pilot curriculum was also aligned with the researchers' journal entries that were documented after each study group session when educators were revisiting evidence from the portfolios and sharing personal reflections on the "How it went with students" part of the pilot activities (footsteps).

During the study group meetings, some participants even suggested adopting a similar curriculum design for promoting some of the identified competencies with more traditional subjects such as mathematics and language that include specific knowledge and abilities to accomplish specific learning tasks. According to the second research question about the extent to which the OOEL pilot curriculum was aligned to the "Skills Labs" framework, the high percentage of teachers' agreement on the level of alignment confirmed that OOEL curriculum design -aside from being coherent with the proposed framework- was logical within grade level.

Table 2. The Contribution of the OOEL Pilot Curriculum in Fostering the Proposed Competencies

Compared to your regular practice to what extent OOEL curriculum was useful for promoting		A little useful	Somewha t useful	Quite useful	Very useful
critical thinking	N	0	12	48	60
	%	0.0%	10.0%	40.0%	50.0%
creativity	N	4	4	36	76
	%	3.3%	3.3%	30.0%	63.3%
problem solving	N	0	12	64	44
	%	0.0%	10.0%	53.3%	36.7%
communication	N	0	8	16	96
	%	0.0%	6.7%	13.3%	80.0%
collaboration	N	0	12	12	96
	%	0.0%	10.0%	10.0%	80.0%
perspective taking	N	0	20	32	68
	%	0.0%	16.7%	26.7%	56.7%
empathy	N	4	12	28	76
	%	3.3%	10.0%	23.3%	63.3%

As shown in Table 3 the views of those being “Very aligned” were above 50% in all items with an exception only regarding “Learning principles” where the “Quite aligned” option was equal to 59.2%. This finding is considered important given participants’ high-grade range (from kindergarten to 6th grade) that accordingly affected the use of developmentally appropriate competency-based methods (a requirement set out by the “Skills Labs” project). Specifically, of the total number of participants that have selected the “Very” and “Quite” useful option, the vast majority (98.3%) indicate the “assessment tools” that were designed according to the structures of the OOEL strategies. The research team considered this finding as rather expected due to the many challenges educators face in identifying and interpreting evidence that documents competence development. A large number of respondents (N=113) consider the cultural force of “modeling” fundamental for communicating the knowledge, skills, attitudes and disposition that comprise each competence and would be difficult to be acquired through formal teaching. An equal percentage -but with a lower rate in the “Very useful” option- receive the OOEL “dialogue tools” that appear to be aligned with facilitating respectful interaction among peers of diverse ideas and beliefs, a theme also stressed by the content of the selected thematic pillar. Further review of the researchers’ field notes revealed a correlation between this finding and the existing icons used to represent the OOEL dialogue moves. As noted by many teachers, this symbolic language became a multimodal form of meaning making and promoting communication competence, especially among younger and non-Greek-speaking students. The alignment between the three OOEL principles and competency-based education is documented by the high percentage (91.7%) of participants’ responses that in turn present a relation between the inclination required for the development of competencies and the key learning principles of slowing down, sharing ideas and making connections that inform the OOEL approach. The interrelation between “skills and dispositions” was already emphasized by the “Skills Labs” framework, so it was not surprising to see a high percentage of alignment in teachers’ responses (90.8%). Accordingly, a large number of teachers (N=104) have favored the use of thinking routines as tools to foster the

development of students' competencies across the context of the Greek Ministry's project. The repeated use of thinking routines in the case of the pilot curriculum also motivated educators to infuse concrete opportunities for students to demonstrate competent behaviour in learning activities related to different subject areas of the existing curriculum for primary education. Such examples of transferring and applying thinking routines in different contexts were often recorded in the researchers' journal entries. Although the item of the OOEL "activities" (footsteps) receives a relatively lower percentage (85%) the level of its alignment with the "Skills Labs" framework remains high as the proposed learning activities appear to have a clear competence orientation.

Table 3. The OOEL Elements aligned with the "Skills Labs" Framework

To what extent OOEL elements are aligned to the "Skills Labs" framework?		A little aligned	Somewhat aligned	Quite aligned	Very aligned
Emphasis on skills and dispositions	N	4	7	34	75
	%	3.3%	5.8%	28.3%	62.5%
Learning principles	N	0	10	71	39
	%	0.0%	8.3%	59.2%	32.5%
Modeling	N	1	6	21	92
	%	0.8%	5.0%	17.5%	76.7%
Thinking routines	N	2	14	18	86
	%	1.7%	11.7%	15.0%	71.7%
Activities (Footsteps)	N	0	18	39	63
	%	0.0%	15.0%	32.5%	52.5%
Dialogue tools	N	1	6	39	74
	%	0.8%	5.0%	32.5%	61.7%
Assessment tools (based on the OOEL strategies)	N	0	2	40	78
	%	0.0%	1.7%	33.3%	65.0%

As for the last research question, the thematic categories emerging from data analysis revealed several factors that can have a positive or negative impact on competency-based education (see Table 4). Regarding the gains for competency-based teaching practice the most popular category was the "Explicit tools for assessing the achievement of competencies" emerged by 42 respondents. The statements associated with this category highlight the effective design of the assessment tools that enabled teachers to acquire vital information about the learning process in order to monitor students' progress on competencies development. The next category emerged from 24 teachers' responses was the "Outcome oriented OOEL strategies" that stress the contribution of thinking routines and dialogue tools in making explicit the components of competencies and thus supporting learners to reach endpoint performances. Following was the category of the "Relevance between the OOEL principles and competencies development" that emerged from 18 responses and outlines how slow looking, exchanging stories and making connections created opportunities for promoting the identified competencies within the content of the selected thematic pillar. The categories of the "Interdisciplinary learning activities" and the "Opportunities for modeling competence" were stated by an equal number of teachers (14) who on the one hand, favor the interdisciplinary design of the OOEL footsteps and on the other, recognize the opportunities given for making

competent performances visible. The less popular category was the “clear definition of the term competence” mentioned by 8 teachers that seems reasonable as the term was already analyzed in the “Skills Labs” framework.

Table 4. Gains and Challenges for Competency-based Education that Result from the Implementation of the OOEL Pilot Curriculum

		N	%
What do you consider is the biggest gain for competency-based education from the OOEL pilot curriculum?	Clear definition of the term "competence"	8	6.7%
	Explicit tools for assessing the achievement of competencies	42	35.0%
	Interdisciplinary learning activities	14	11.7%
	Opportunities for modeling competence development	14	11.7%
	Outcome-oriented OOEL strategies	24	20.0%
	Relevance between the OOEL principles and competencies development	18	15.0%
What do you consider is the biggest challenge you encountered during implementation of the OOEL pilot curriculum?	Inadequate professional development	39	32.5%
	Subjective assessment	21	17.5%
	The designated time for fostering competencies	24	20.0%
	The obligation to cover content	36	30.0%

Designing a competency-based curriculum even by adjusting an already successful program like OOEL was a challenging process. The category of “Inadequate professional development” was reported by 39 teachers who emphasized the need of a better approach less selected by regional authorities and more connected to their authentic classroom contexts. The “Obligation to cover content” emerged from 36 responses that mentioned the difficulty of having to cover all the material outlined in their syllabus and the “Skills Labs” framework. The last two categories of the “Designated time for fostering competencies” and the “Subjective assessment” were also highly considered. Specifically, comments recorded from 24 teachers suggested that, in many cases, they felt under pressure and had to “hurry up to do all the work,” reducing opportunities for implementing “slow looking” and using the OOEL strategies, whereas 21 participants mentioned challenges in acquiring a clear and precise evaluation only by examining evidence from students’ portfolio.

The views of the participants were examined for differences based on gender, type of school, grade level and teaching experience. The findings of the statistical analysis showed in almost all items of comparisons to regular practice, differences based on gender and type of school. Regarding gender, in all cases where statistically significant differences were found, the “Very useful” option was more frequently recorded by female educators comparing to males. Regarding school type, in all cases where statistically significant differences were found, the “Rural” schools replied consistently choosing the “Very useful” option, with almost no responses in the other categories, contrarily to the Urban and Semi urban schools where lower usefulness was also observed. Regarding grade level statistically significant differences were observed for “Critical thinking” where kindergarten teachers

answered more frequently “Very useful” (65%) than “Quite Useful” (25%), whereas elementary school teachers answered more frequently “Quite useful” (47.5%) than “Very Useful” (42.5%) ($p=0,048$). Similarly regarding “Problem solving”, kindergarten teachers answered more frequently “Very useful” (50%) than “Quite Useful” (35%) whereas elementary school teachers answered more frequently “Quite useful” (62.5%) than “Very Useful” (30.0%) ($p=0.017$).

For the remaining items, as well as for the items regarding usefulness of the OOEL elements for identifying and assessing students' competencies no statistically significant differences were observed. Regarding teaching experience, it appears that there was a statistically significant effect only for “empathy among students” ($p=0.029$) and for “Dialogue tools” ($p=0.037$). In both cases teachers with less years of teaching experience answered more frequently “Somewhat useful” comparing to teachers with more years of experience. The observed p value for each comparison appears in Table 5.

Table 5. Independence Test for the Differences in the Teachers' Views depending on Gender, Grade and Teaching Experience

	Gender	Type of school	Grade level	Teaching experience (in years)
<i>Compared to your regular practice to what extent OOEL curriculum was useful for promoting</i>				
Critical thinking among your students?	0.008	0.004	0.048	0.234 ^F
Creativity among your students?	0.002^F	0.029^F	0.436 ^F	0.206 ^F
Problem solving among your students?	<0.001	<0.001	0.017^F	0.198 ^F
Communication among your students?	0.110 ^F	<0.001^F	0.41	0.154 ^F
Collaboration among your students?	0.002^F	0.031^F	0.724	0.534 ^F
Perspective taking among your students?	<0.001^F	0.256	0.399	0.140 ^F
Empathy among your students?	<0.001^F	0.003	0.526	0.029
<i>To what extent OOEL elements were useful for identifying and assessing students' competencies</i>				
Emphasis on skills and dispositions	<0.001^F	0.046^F	0.413 ^F	0.143 ^F
Learning principles	<0.001	<0.001^F	0.709	0.260 ^F
Modeling	<0.001^F	0.013^F	0.267 ^F	0.253 ^F
Footsteps	0.130 ^F	0.076 ^F	0.167 ^F	0.222 ^F
Thinking routines	0.115	0.206 ^F	0.508	0.294 ^F
Dialogue tools	0.090 ^F	0.110 ^F	0.633 ^F	0.037^F
Rubrics	0.475 ^F	0.222 ^F	0.716 ^F	0.355 ^F

^F: Fisher's exact test

A logistic regression model was applied for each of the two items with differences based on grade level including gender and type of school as well, after combining the “somewhat useful” and “quite useful” replies to a common category to face sample size restrictions. The analysis for both different variables showed that the effect of grade level does not remain statistically significant after adjusting for the teachers' gender and type of school, that were univariately statistically significant based on the findings of Table 5. Specifically, the type of school is the only

parameter having a significant effect with a p value equal to 0.008 for “critical thinking” and 0.003 for “problems solving”, while the p value for the grade level in “critical thinking” equals 0.173 and 0.624 for “problems solving”. The effect of gender also turns non-significant.

As shown in Figure 3, differences regarding the item for the biggest gain by grade level indicated that elementary school teachers chose mainly (41.25%) that the biggest gain is “The explicit tools for monitoring progress towards the achievement of competencies” while kindergarten teachers chose the same but also “The opportunities for demonstrating competence development” (p=0.001).

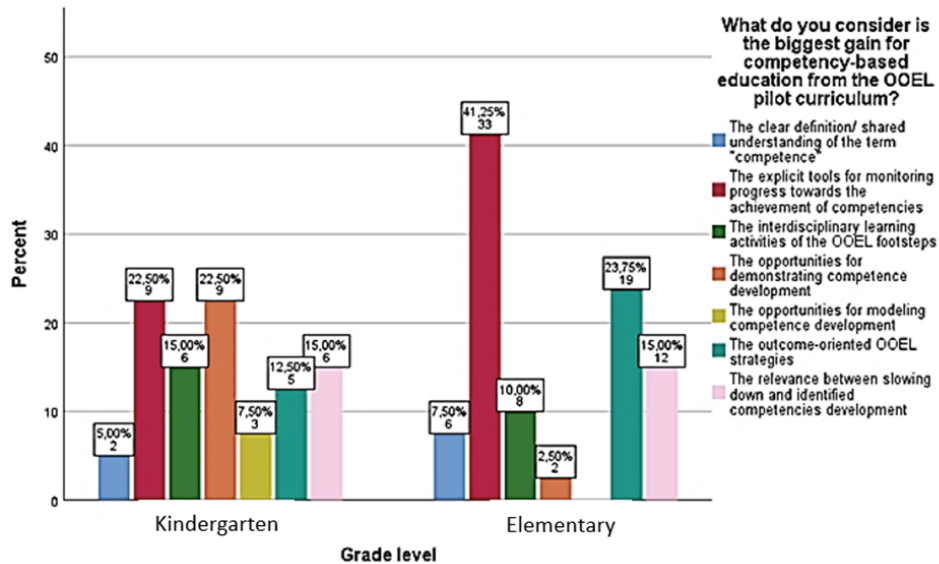


Figure 3. Differences regarding the Biggest Gain based on Grade Level

Regarding the biggest challenge, as shown in Figure 4, elementary school teachers chose mainly “The obligation to cover content” (45%), whereas the kindergarten teachers chose only, and equally, “Inadequate professional development” and “The designated time for fostering competencies” (p<0.001).

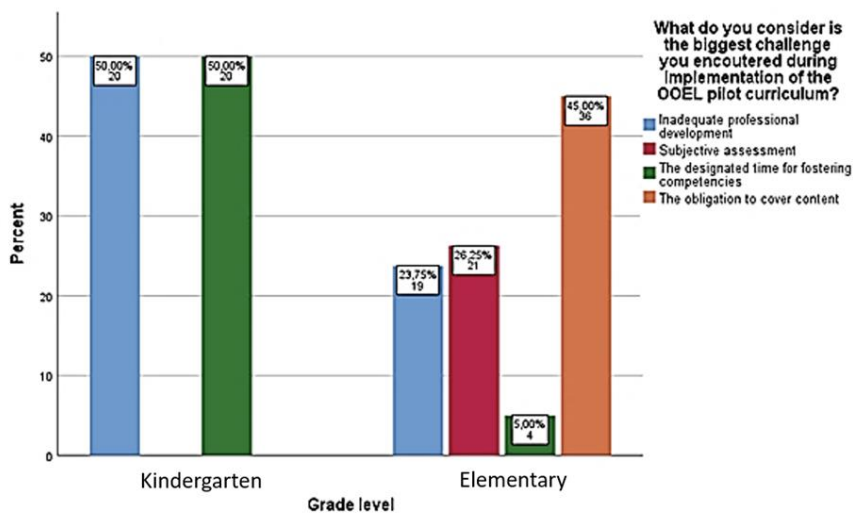


Figure 4. Differences regarding the Biggest Challenge based on Grade Level

Statistically significant associations were also found between the answers to the “To what extent is the OOEL pilot curriculum aligned to the 21st century Skills Labs framework?” and all the items that concern the usefulness of the OOEL curriculum comparing to regular practice. In all cases the teachers that answered, “Very useful” always chose “Quite aligned” or “Extremely aligned”.

Discussion

The findings revealed the value of the OOEL approach for designing a competency-based curriculum that aligns to the “Skills Labs” framework. The OOEL strategies served as pedagogical tools for making the proposed competencies visible and understandable within the context of classroom practice. Furthermore, the holistic perspective of the designed activities grounded the development of competencies in situations that moved learners toward specific performances that were logical and coherent within grade levels. Regarding the school type differences, rural schools appeared to favor the OOEL curriculum at a higher rate than non-rural schools because the learning activities were grounded in building a responsible and respectful relationship with the local community. In addition, the teachers at rural schools highlighted the "lighter" workloads and lower numbers of enrolled students, than their urban counterparts which enabled them to “slow down” and work through the OOEL strategies with their students. The unique strengths of rural schools and the relation between time and advancement of competencies are also confirmed by international studies (Smekalova et al., 2023; McArdle, 2019). The statistical significance between grade level indicated that critical thinking and problem solving are particularly essential in kindergarten where a tremendous amount of social and emotional development takes place through children’s interactions. The kindergarten teachers identified the OOEL strategies as very useful tools for structuring the social environment and creating patterns of thinking critically and solving problems. Those findings are aligned with studies that have recorded kindergarten teachers’ perceptions about the significance of nurturing those competencies from a young age through appropriate strategies (Leggett, 2022). Besides reflecting on the curriculum design the study provided insights into the gains and challenges that can inform about the implications of the OOEL approach in competency-based teaching and learning:

Competencies are developed through modeling

Modeling played an important role in demonstrating the OOEL strategies and fostering students’ inclination toward a competent behaviour. By demonstrating their own practice of performing a competence, teachers engaged students in a process of experience that was beneficial as a scaffolding technique especially in kindergarten. The efficacy of modeling in competency-based education is also reported by studies that informed the competencies implementation framework of the Council of Europe (2018).

Teaching and learning of competencies should be related to the standard curriculum

Competency-based education is an ongoing process unlikely to be sustained as a result of an individual project. The implementation within the given 7-week period related with statements in the categories of “Obligation to cover content” and “Designated time for fostering competencies” can have a consequence of an inevitable

educational superficiality if it is to be approached as an isolated teaching and learning effort. Based on this premise, it is essential to perceive OOEL as an interdisciplinary model of organizing teaching and learning of competencies in relation to the existing curriculum. This suggestion is similar to OECD's (2020b) recommendation for a curriculum that favors the interdisciplinarity and interrelatedness of competencies across different subject areas and contexts and further into students' lives outside of school.

Assessment of competencies relies on transparency

The development of explicit assessment tools based on the OOEL strategies had the advantage of providing accurate and clear information about the learning outcomes that are going to be assessed. This was particularly important for elementary teachers that emphasized in reliability and validity for monitoring students' progress towards the achievement of competencies an issue not clearly stated by the Skills Labs framework. This finding can be compared with similar research carried out by Project Zero researchers (Clapp et al., 2019) on using the OOEL strategies to design effective tools for documenting and making learning visible.

Teachers' professional development needs to be aligned with competency-based education

Competency-based education will probably remain theory without teachers who are in a position to experience, understand and implement it. In this study, "inadequate professional development" was mentioned as the biggest challenge because teachers missed opportunities to direct the focus and timing of their learning experience and to engage with colleagues in a community of practice. This result is consistent with studies on the challenges of teachers' professional development (Fairman et al., 2020). It is therefore necessary to establish and sustain learning communities where teachers can engage in ongoing learning experiences that empower their professional identities around competency-based education and allow them to perceive themselves as key actors of change.

Conclusion

The study sought to explore the implications of Harvard's OOEL approach in promoting competency-based teaching and learning by designing and infusing a pilot OOEL curriculum within the framework of the Greek Ministry's project. Although this work is specific to the "Skills Labs" context, yet its insights on the use of the suggested OOEL strategies will likely be relevant for educators who wish to improve the development of competencies among their students in a wide array of international settings. No generalizations can be drawn because of the small number of participating teachers, although the OOEL approach guiding this specific competency-based curriculum design might be applicable and adaptable to other contexts. The issues identified through the study can also lead to implications for future research related to the OOEL approach and to recommendations for policy reforms in competency-based teaching and learning.

Acknowledgements

We are grateful for the support of Harvard's Project Zero Out of Eden Learn research team, especially for the

contributions of Principal Investigators Liz Dawes Duraisingh, Carrie James, Shari Tishman, and Sarah Sheya, OOEL's Project Manager. We would also like to thank our collaborating teachers whose insights and dedication directly informed our work. The development of the OOEL competency-based curriculum is part of a bigger research program that is generously supported by Anne Germanacos and the Laskaridis Foundation.

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