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Initial Teacher Education in the Region of Western Greece: What does the student learn from the curriculum?

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Abstract: The shift from science-based curricula to curricula based on learning outcomes has been a major change for higher education. It is a radical curriculum design model transfer for higher education. The proposed research focuses on this new model that is the most difficult point assessment between expected learning outcomes and acquired learning outcomes. The given example is the initial programme of study of a Department of Primary Teacher Education, located in the region of Western Greece (Greece). In this research students were asked to answer whether they have developed the learning outcomes. The tool used comes from the European Tuning project which is of great importance in learning. From Tuning were taken the generic and specific competencies proposed for the field "Education". The questionnaire was divided into three levels. The first one concerned the students' diagnosis of the relevance of Tuning competencies. The second concerned the recognition of their

existence within the curriculum. The third level concerned the students' self-assessment of whether they have developed these competencies. The innovation of the article lies in: a) the object itself, in other words the construction of a tool to investigate the effectiveness of student learning, b) the fact that the students were questioned on issues (learning outcomes) concerning the design of their curriculum and its effectiveness (learning). The results showed that students have a full understanding concerning the developed or not developed competencies. Consequently, students seem to be able to evaluate their learning process and its effects on them.

Keywords: Initial Teacher Education, Learning outcomes, Students, Assessment.

Introduction

In recent decades, higher education curricula have moved from the notion of treating a scientific field to constituting them on the basis of learning outcomes. This movement, although common in the European Higher Education Area (but not only in Europe), has taken place at different understandings and speeds both at national and institutional level (Bohlinger, 2007; CEDEFOP, 2010; 2016; 2017; Harris & Clayton, 2019; Patelis, 2022; Vermunt & Vermette, 2004). The adoption of the European (and national) Qualification Framework and the cumulative experience helped making a more systematic use of learning outcomes (CEDEFOP, 2017). The learning outcomes are seen as key, on the one hand, for the connection to the labour market, and thus for the greater professionalization of studies, and on the other hand, for their evaluation (Grosemans et al., 2017; Lennon 2016; Noda et al., 2020).

Regarding the evaluation, the issue is to measure the distance between the expected learning outcomes (product of the experts' construction) and the learning outcomes acquired by the graduates (final product of the learning period on the basis of a curriculum) (Emplit, 2020; Gaebel et al., 2018; Taalas & Grönlund, 2020). The difficulty of measuring the development of learning outcomes in learners and linking them, on the one hand, to teaching methods and, on the other hand, to assessment methods has proven to be great (Belland et al., 2009; Holmes, 2019; Yurdugül & Cetin, 2015). Beyond this difficulty, however, it is a common starting line of analysis: that there is someone who knows and plans and someone who does not know and will try to learn. In other words, the students are seen, at the beginning of the programme, as *tabula rasa* that, through a vehicle (curriculum), will end up forming a scientific professional identity.

But is it so? In the earlier engagement with the issue it was found, in the case of a Department of Education (education sciences + teacher education) that students have formed perceptions of the professional field they are aiming for and do not always seem willing to move from them even when the curriculum gives them relevant stimuli. However, in this engagement because it was exclusively concerned with only students of last year of studies (degree level), the impact of the curriculum was not clear since we did not know the starting point i.e. the moment of entry into the programme (Stamelos & Evangelakou, 2018a; 2018b; 2019).

On the other hand, the attempt to construct similar curricula by different groups of experts on the basis of learning outcomes demonstrated the plethora of approaches and diversity of options. Different countries have tried to address the problem with different methods. In the UK, this role is played by Subject Specific Benchmarks written by experts (Quality Assurance Agency, 2023). In France, it is more the Ministry that defines the teacher's profile and proposes learning outcomes on the basis of education axes (Ministère de l'Éducation Nationale et de la Jeunesse, 2023). The equivalent at European level has

been attempted by the flagship European Tuning programme (<http://www.unideusto.org/tuning/>). The Tuning 'Education' group proposed a list of competencies for the relevant studies, divided into general and specific ones.

Moreover, the debate on student participation in the evaluation of various institutional aspects is always a controversial one. Several questions emerge, such as: How the diversity of evaluations can be understood? What is their purpose? Why involve students in the process? The last question is of particular interest to us. Students are asked to assess the quality of teaching, but not its content. A distinction is drawn between content and teaching. However, a judgment about teaching can hide an interest or disinterest in the content taught, either for the content itself or in relation to students' expectations of such training. Despite this undeniable relationship, the evaluation of content remains something of a taboo. A taboo rooted in the traditional idea of education as an activity in which someone who knows transmits to someone who doesn't. This idea has stood the test of time, and it has its *raison d'être*, but today it is challenged, at least in part. In fact, students are adults, in full exercise of their civil rights. In the Anglo-Saxon world, educational evaluation has a long history. It is accepted that the first questionnaire was constructed by students themselves at Harvard in 1926 (Germain-Rutherford, 2003). Later, in the 1970s and 1980s, the subject of "teaching evaluation" became very popular. Today, the questionnaire (Students' Evaluation of Education Quality Questionnaire (SEEQ)) has been the most widely tested and recognized since the late '80s (Marsh, 1987). SEEQ is not the only one, other tools are also being tested, such as: a) Course Experience Questionnaire (CEQ), b) Module Experience Questionnaire (MEQ), c) Postgraduate Research Experience Questionnaire (PREQ) and d) Experiences of Teaching and Learning Questionnaire (ETLQ) (Corbalan et al, 2013). On the other hand, from the '90s onwards, interest emerged in student experience in relation to their 2d degree (Master) studies. Early attempts include the work of Bowen and Rudenstine (1992) in the USA and Becher et al. (1994) in the UK. However, a well-organized national effort appears to have emerged in Australia in 1999, entitled the Postgraduate Research Questionnaire (PREQ) and initiated by the country's Council for Education Research (ACER). PREQ is distributed to all Masters and Thesis graduates. It is developed by analyzing the results of research into the experience of Master's students, institutional evaluations, recognized good practice and feedback received from lecturers and focus groups of Master's students (Marsh et al., 2002). PREQ is structured along six axes: a) infrastructure, b) intellectual climate, c) objectives and expectations, d) tutoring system, e) defence, and f) outcomes, i.e. the skills that graduate-themselves-believe they have developed (Stamelos, 2016). Finally, in the UK, Oxford University has proposed a version of PREQ, PRES, also structured along 6 axes: a) student characteristics, b) motivations and expectations, c) perception of the educational environment, d) course framing, e) research design, and f) research outcomes (Trigwell & Dunbar-Goddet, 2005). In Greece, students are involved in both the process of evaluating their study programs and institutions and in the quality assurance of teaching. Thus, they express themselves not only on their direct experience in the classroom (teaching), but also on their overall experience in the institution. As a result, their institutionalized opinion becomes crucial, on one hand, for the external evaluation of their study programs and/or institutions, and on the other, for the professional promotion of their teachers. However, this plethora of student evaluations does not concern certain aspects of their studies, such as the content of their training - a domain supposedly reserved for specialists. Consequently, the initial question was to experiment with students' ability to evaluate the content of their training. Two questions followed: a) what framework should be used? and b) what tool should be used?

Research Problem

The introduction of learning outcomes, as a key component of student-centred learning, was seen as a major change in the way university curricula are conceived. The importance and gains from learning outcomes were highlighted through a multiple exploration of the international literature (Mahajan & Singh, 2017). However, the monitoring of the achievement of learning outcomes and the link between teaching, evaluation and learning outcomes proved to be a critical point with significant control difficulties (Hussey & Smith, 2002).

The research problem is the evaluation of the achievement of learning outcomes at the end of an educational period. The problem lies in the fact that it proves difficult to systematically and reliably test the success of the transmission of the expected learning outcomes. Essentially, the challenge is to investigate the learning process starting from the identification of learning outcomes, the structuring of the curriculum, the teaching methods and the modes of assessment, with the final outcome being the verification of the effective acquisition of learning outcomes by graduates (Oliver et al., 2008).

In this context, the main stakeholders, students/graduates, are rarely asked to give their opinion (Aziz et al., 2012). This is the focus of the research. In other words, this research questions students, at the beginning and at the end of their studies, about the importance of learning outcomes, whether they recognise in their curriculum efforts to develop learning outcomes and, finally, whether they themselves consider that they have developed learning outcomes. The innovative element of our research is the longitudinal comparison of the evolution of students' evaluation of the acquisition of learning outcomes. Indeed, we asked students at the beginning (semester 1) and at the end of their studies (semester 8) and then compared their responses (Stamelos & Evangelakou, 2018a; 2018b).

Research Focus

Based on the proposed experience to date, 1st year students were questioned (1st semester) in 2017- 2018, about competencies-Tuning. We did the same, in the spring of 2021 when the same students were in their 8th and final semester of their studies.

Research Aim and Research Questions

The aim was to discern the effect of four years of study on the competencies-Tuning. Finally, what is the effect of their curriculum on the way they view the competencies that are considered important for the formation of their scientific identity.

More specifically, the research questions were:

- a. Do students consider Tuning competencies appropriate for their field of study?
- b. Have they encountered activities in their curriculum related to these competencies?
- c. Have students developed these competencies ("The self-evaluation")?

Research Methodology

General Background – Sample/Participants/Group

The sample of the survey comprised 181 first year and 81 final year students of the Department of Education and Social Work, University of Patras. This questionnaire was distributed to the students

with an entrance academic year of 2017-2018, in their first and final (8th) semester of studies. A comparison was then made of the mean responses in the 1st and 8th semesters.

In the first semester (October 2017) the questionnaires were distributed during a compulsory course for the first year and 180 questionnaires were completed. In the final (8th) semester (May 2021) due to the pandemic and distance learning, the questionnaire was filled in electronic form during a compulsory course of the final-year and 84 questionnaires were completed. Finally, to ensure the quality of data analysis, after completeness, 180 and 81 questionnaires were kept for further analysis respectively; this imbalance could be considered as a limitation in this study. As for the gender of the participants, for the first year 32 (17.8%) of them were men and 147 (81.7%) were women, while for the final year we had 15 (18.5%) and 66 (81.5%) respectively (one of the participants did not declare gender).

Instrument and Procedures

The questionnaire consisted of the following sections:

- Sample description: gender, high school diploma grade, geographical origin, department preference order, mother' education and father's education.
- To investigate the research questions, the participating students were asked on a 5-point Likert-type scale (1 = very little 2 = Little 3 = Moderate 4 = Much, 5 = Very much) how important they consider each of the Tuning competencies, how much they have encountered and how much they have developed each of them. In more detail:

General and Specific Tuning competencies were used constructing the questionnaire; 24 items as General competencies and 28 items as Specific competencies, which are presented in detail in Tables 4 and 8. For all items students were asked to declare how important they consider it (legitimacy of Tuning competencies, from now on it will be referred to as competency importance). In the second part, students were asked whether they experienced them in their curriculum, i.e. whether they could recognise curriculum activities related to the competences in question (curriculum, from now on it will be referred to as frequency of occurrence in the curriculum). Finally, in the third part, students were asked whether they consider that they have developed each one of the competencies (self-assessment, from now on referred to as readiness to use). The content of the questionnaire bases its validity on the use of Tuning competences (general and specific), which have been widely used both in Europe and in other regions of the world (e.g. South America, Africa, etc.).

The data analysis was based on the comparison of the means between the 1st and 4th year on the individual items (24 items as Generic competencies and 28 items as Specific competencies), in terms of the three parameters examined, i.e. importance, frequency of occurrence in the curriculum, readiness to use.

A comparison of the overall means on importance, frequency of occurrence in the curriculum, and readiness to use was also made. The aim was to identify any statistically significant differences between Year 1 and Year 4. Cronbach's α respectively were calculated: on importance (0.914 for Generic competencies, 0.946 for Specific competencies), on frequency of occurrence in the curriculum (0.935 for Generic competencies, 0.954 for Specific competencies) and on readiness (0.903 for Generic competencies, 0.945 for Specific competencies) (reliability proved). After this, we investigated the

possible effects of "importance" and "frequency" on "readiness" through a regression analysis for Generic and Specific competencies.

The processing was done with IBM/SPSS V. 26 and the hypothesis test applied to the comparison was the Paired Samples T-test.

Data Analysis – Demographic data. Based on the demographic data, the vast majority of students are female (81.7% in the 1st year sample, 81.5% in the 4th year sample) with a high performance in high school (>16/20, 86.7% in the 1st year, 93.8% in the 4th year). These studies are first choice (positive choice)¹ for the students (1st choice for 51.7% and overall from 1-3 choice for 91.1% of the 1st year, 50.6% and respectively 87.6% of the 4th year. The geographical origin of the students is mainly from Western Greece (47.2% for the 1st year and 45.7% for the 4th year) and Attica (23.9% and 33.3%). In other words, the best students (who want to do these studies) from the region of the Department choose this study programme and those from Attica (Athens) do not manage to get into the corresponding Department in Athens. Finally, it is a social upward mobility programme of study to the extent that about 2 out of 3 parents have no experience in higher education (37.8%-1st year and 32.8%-4th year of mothers and 33.3%-1st year and 30.9%-4th year of fathers have higher education experience).

¹ In Greece the system of access to higher education is a combination of the results in the national examinations and the choice of each candidate on the basis of his/her preferences.

The demographics are presented only to capture the sample, providing a socio-economic frame of reference for the survey. In this paper, a further correlation of demographics with competence development is not needed, given its purpose.

Research Results

Generic Competencies

Importance. The importance that students attribute to generic competencies was investigated. A great importance was attached to the proposed competencies.

Table 1

Generic Competencies: Importance

Generic Competencies	Mean* (1-5)	Std. D.	Sig. (2-tailed)
Average mean of generic competencies for 4 th year	4.36	0.386	0.764
Average mean of generic competencies for 1 st year	4.34	0.502	

*1 = very little 2 = Little 3 = Moderate 4 = Much, 5 = Very much

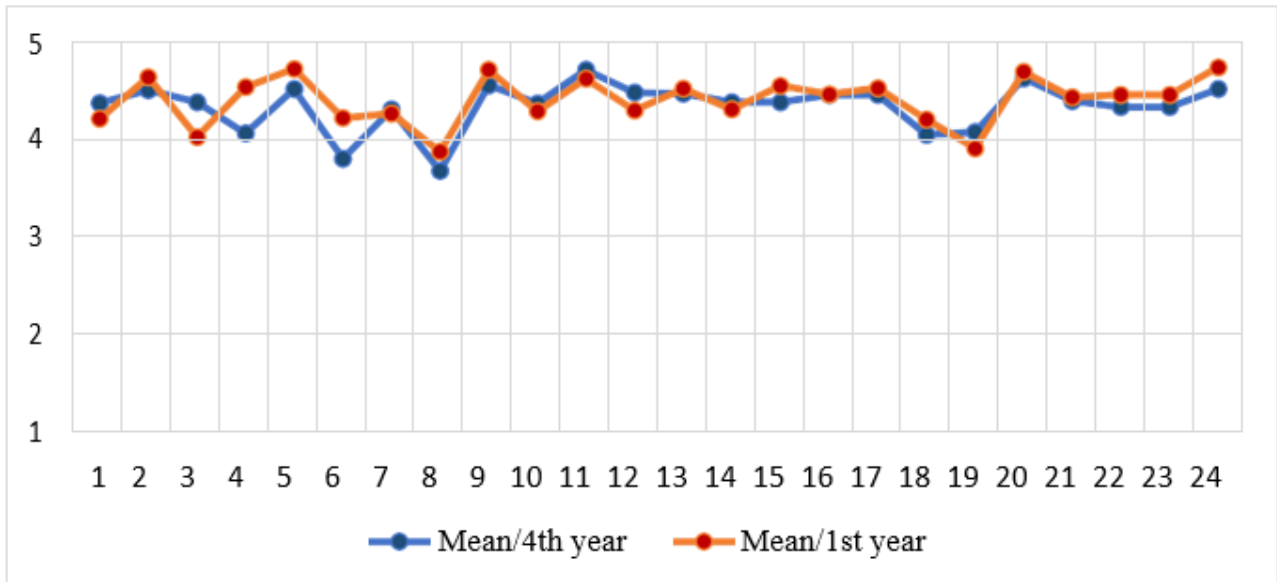
Based on the students' responses, a great importance was attached to the proposed generic competencies. In fact, the importance did not vary over the years of studies.

The importance was particularly high for all competencies, with the lowest mean in the first year in the "ability to undertake the research at an appropriate level" (3.81 mean). In the 4th year, two

competencies showed a mean below "4": a) "The ability to communicate in a second language" (3.81) and b) "the ability to undertake research at an appropriate level" (3.69).

Figure 1

Generic Competencies: Importance (Analytic)



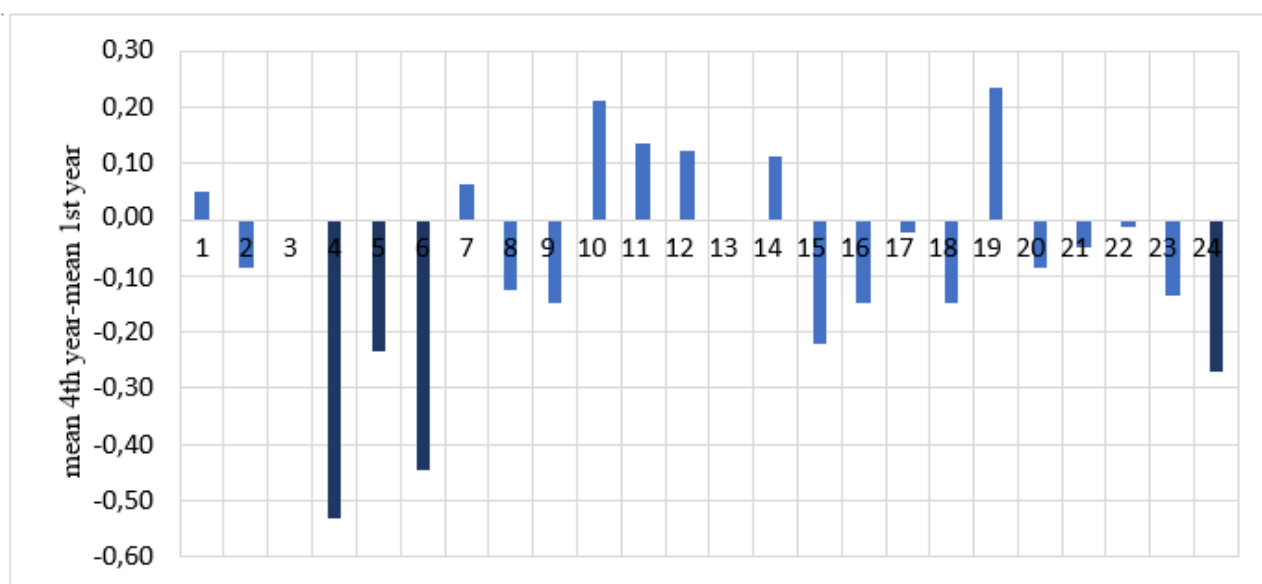
Based on the Figure 2, only four generic competencies showed a statistically significant difference in student responses (between Year 1 and Year 4). In all four cases this was a drop in mean.

These competencies were:

- 4. The knowledge and understanding of the subject area and understanding of the profession
- 5. The ability to communicate both orally and through the written word in native language
- 6. The ability to communicate in a second language
- 24. The ability to act on the basis of ethical reasoning.

Figure 2

Generic Competencies: Importance (Evolution)



In conclusion, the next information is relevant: a) the importance of generic competencies did not vary over the years of studies and b) as far as the few statistically significant differences were concerned, they had different origins:

- Competencies having the lowest importance at the beginning of studies and not changing during study (“the ability to undertake research at an appropriate level”). In other words, the curriculum did not succeed in modifying the initial perception about the limited importance of research in these studies.

- Competencies with a large decrease during the studies (“the ability to communicate in a second language” and “The ability to act on the basis of ethical reasoning”). In other words, the curriculum did not highlight the importance of the second foreign language and the ethical commitment to the requirements of the profession.

- Competencies which, progressively and with the experience, were taken for granted (obvious) (“The knowledge and understanding of the subject area and understanding of the profession” and “Ability to communicate both orally and through the written word in native language”).

Frequency. Then, the frequency with which students perceived the promotion of generic competencies by their curriculum was investigated.

Table 2

Generic Competencies: Frequency

Generic Competencies	Mean* (1-5)	Std. D.	Sig. (2-tailed)
Average mean of generic competencies for 4 th year	3.66	0.555	0.000
Average mean of generic competencies for 1 st year	3.25	0.659	

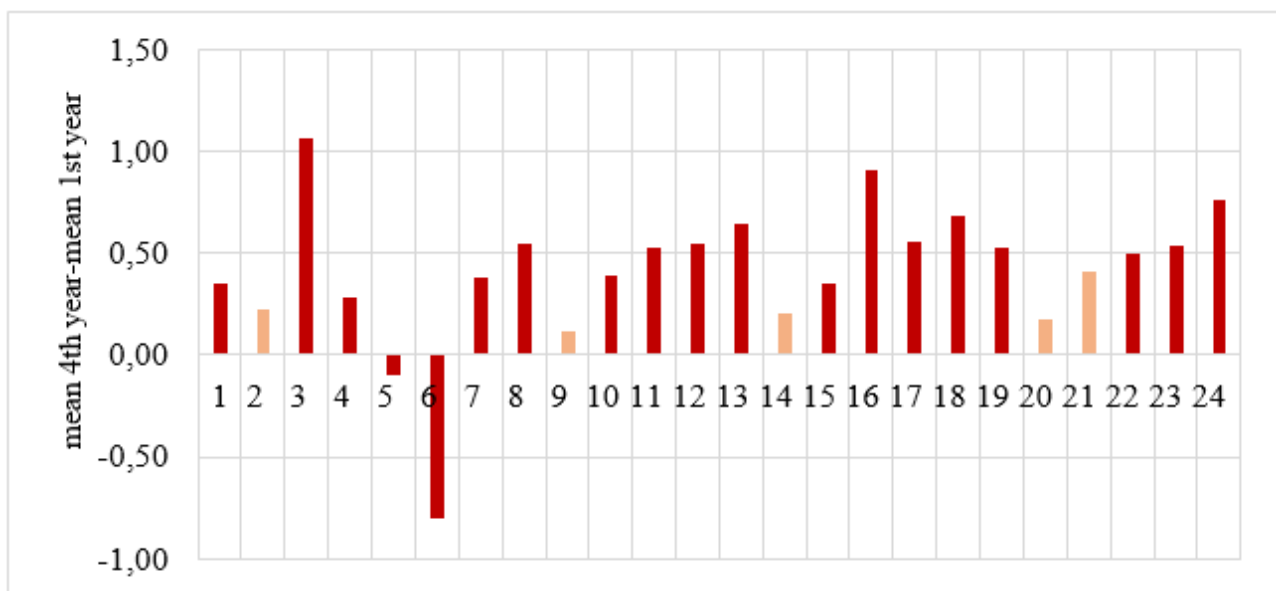
*1 = Very little 2 = Little 3 = Moderate 4 = Much, 5 = Very much

Based on the students' responses, the frequency of encountering generic competencies in the curriculum, from the 1 to the 4 year increased in a statistically significant way. It is an expected outcome. However, the mean in frequency is less than that of significance. Of course, if reserving as a limitation of the survey, the analysis highlighted a point for further investigation: it is not clear if students in year 1 responded to whether they had already encountered them in the curriculum or whether they thought they would in the future.

The figure 3 shows that frequency increases in a statistically significant way in 17 of the 24 generic competencies. In five other competences the increase is not statistically significant. In two competences the frequency decreased in a statistically significant way ("The ability to communicate both orally and through the written word in native language", "The ability to communicate in a second language").

Figure 3

Generic Competencies: Frequency (Evolution)



Readiness. The readiness (self-assessment) of the students in terms of generic competencies was investigated.

Table 3

Generic Competencies: Readiness

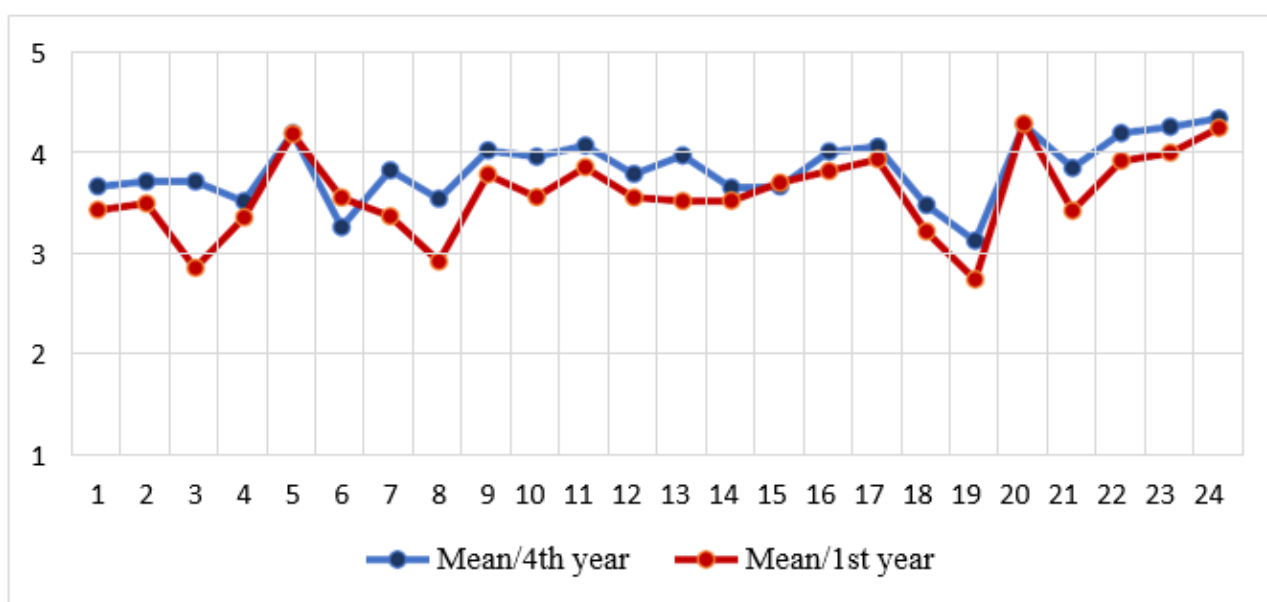
Generic Competencies	Mean* (1-5)	Std. D.	Sig. (2-tailed)
Average mean of generic competencies for 4 th year	3.84	0.452	0.000
Average mean of generic competencies for 1 st year	3.51	0.553	

Based on the students' responses, the level of readiness they perceive to have mastered from the curriculum, from the 1 to 4 year increased in a statistically significant way. However, the mean of readiness was lower than that of significance and higher than that of frequency. Of course, the limitation of the research that one point emerged during the analysis for further investigation was the importance of maturity and awareness. In other words, the 4th year responses have the added value of greater awareness of individual competencies through the influence of, on one hand, the curriculum and, on other hand, age.

Figure 4 shows in detail the means of readiness on generic competencies from year 1 and 4 year.

Figure 4

Generic Competencies: Readiness (Analytic)



Based on the next graph (Figure 5), it is visible that the means in 22 of the 24 generic competencies increased (one remained stable and one decreased). However, the increase was statistically significant in nine (9) generic competencies:

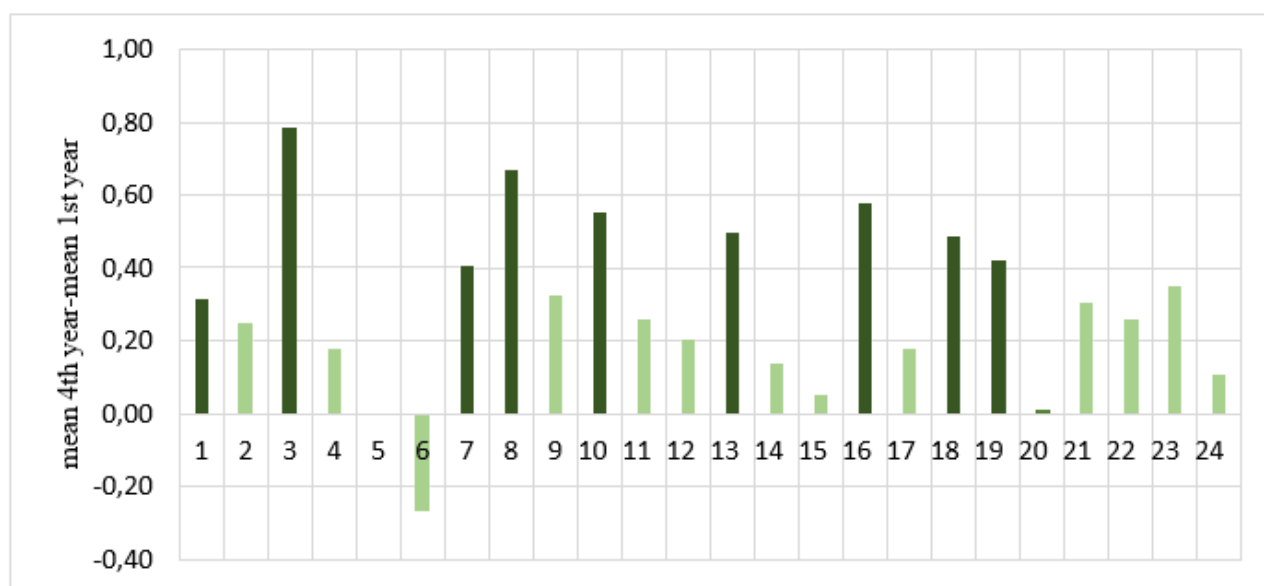
- 1. The ability for abstract thinking, analysis and synthesis
- 3. The ability to plan and manage time (for an educative activity)
- 7. Skills in the use of information and communications technologies
- 8. The ability to undertake research at an appropriate level
- 10. The ability to search for, process and analyze sources
- 13. The ability to generate new ideas (creativity)
- 16. The ability to work in a team

- 18. The ability to motivate people and move toward common goals
- 19. The ability to communicate with non-experts of one's field.

One could argue that these nine (9) generic competencies reflect the strengths of the curriculum on student learning.

Figure 5

Generic Competencies: Readiness (Evolution)



Generic Competencies: Holistic Approach

Table 4

Generic Competencies – Means 4th Year - Ranking in Terms of Readiness⁴

Generic Competencies - 4 th year		Importance		Frequency		Readiness	
	1 = very little 2 = Little 3 = Moderate 4 = Much, 5 = Very much	Mean (1-5)	Std. D.	Mean (1-5)	Std. D.	Mean (1-5)	Std. D.
24	The ability to act on the basis of ethical reasoning	4.53	0.59	3.98	0.97	4.35	0.73
20	The appreciation of and respect for diversity and multiculturalism	4.64	0.69	3.85	1.05	4.28	0.88
23	The ability to evaluate and maintain the quality of work produced	4.35	0.62	3.94	0.81	4.26	0.78

5	The ability to communicate both orally and through the written word in native language	4.53	0.59	4.11	0.95	4.20	0.77
22	The ability to work autonomously	4.35	0.62	4.17	0.70	4.20	0.69
11	The ability to be critical and self-critical	4.73	0.45	3.75	1.00	4.07	0.67
17	Interpersonal and interaction skills	4.47	0.73	4.00	0.76	4.06	0.83
9	The capacity to learn and stay up-to-date with learning	4.57	0.59	3.88	0.95	4.02	0.71
16	The ability to work in a team	4.47	0.69	4.00	0.79	4.01	0.81
13	The capacity to generate new ideas (creativity)	4.48	0.59	3.75	0.90	3.98	0.72
10	The ability to search for, process and analyse information from a variety of sources	4.38	0.62	3.85	0.85	3.96	0.68
21	The ability to work in an international context	4.41	0.75	3.26	1.22	3.85	1.06
7	Skills in the use of information and communications technologies	4.32	0.63	3.54	0.92	3.83	0.83
12	The ability to adapt to and act in new situations	4.49	0.57	3.57	0.99	3.79	0.77
2	The ability to apply knowledge in practical situations	4.52	0.57	3.57	0.99	3.72	0.79
3	The ability to plan and manage time (for a educative activity)	4.40	0.56	3.78	0.82	3.72	0.78
1	The ability for abstract thinking, analysis and synthesis	4.39	0.63	3.51	0.94	3.67	0.68
15	The ability to make reasoned decisions	4.40	0.66	3.53	1.03	3.67	0.88
14	The ability to identify, pose and resolve problems	4.40	0.65	3.48	0.94	3.65	0.73
8	The ability to undertake research at an appropriate level	3.69	0.82	3.46	0.92	3.54	0.88

4	The knowledge and understanding of the subject area and understanding of the profession	4.07	0.63	3.68	0.83	3.52	0.77
18	The ability to motivate people and move toward common goals	4.06	0.81	3.48	1.01	3.48	0.97
6	The ability to communicate in a second language	3.81	0.82	2.51	1.15	3.26	1.12
19	The ability to communicate with non-experts of one's field	4.09	0.78	2.99	1.25	3.12	1.09

More specifically, in Year 4, the nine generic competencies with a readiness average above "4", i.e. "24, 20, 23, 5, 22, 11, 17, 9, 16, were those of that also in Year 1 had readiness averages around "4". Therefore, the curriculum effect comes to reinforce competencies that students thought they had already developed (and/or considered important). Also, in four of them (5, 22, 17, 16) there were all four highest frequency means.

The readiness of these nine generic competencies was influenced by the importance and the frequency respectively, in "adequate" ($0.176 < R^2 < 0.552$) and statistically significant regression models (F-test, $p < 0.01$), with statistically significant effects (t-test, $p < 0.05$).

For these nine statements, the importance had a greater effect on generic competence readiness than the frequency, except for 5 and 22, where frequency showed the greatest effect.

Specific competencies

Importance. The importance that students attach to specific competencies was explored.

Table 5

Specific Competencies: Importance

Specific Competencies	Mean* (1-5)	Std. D.	Sig. (2-tailed)
Average mean of specific competencies for 4 th year	4.32	0.458	0.430
Average mean of specific competencies for 1 st year	4.25	0.653	

*1 = Very little 2 = Little 3 = Moderate 4 = Much, 5 = Very much

Based on the students' responses, a great importance is attached to the proposed specific competencies. In fact, the importance did not vary over the years of the studies.

Figure 6

Specific Competencies: Importance (Analytic)

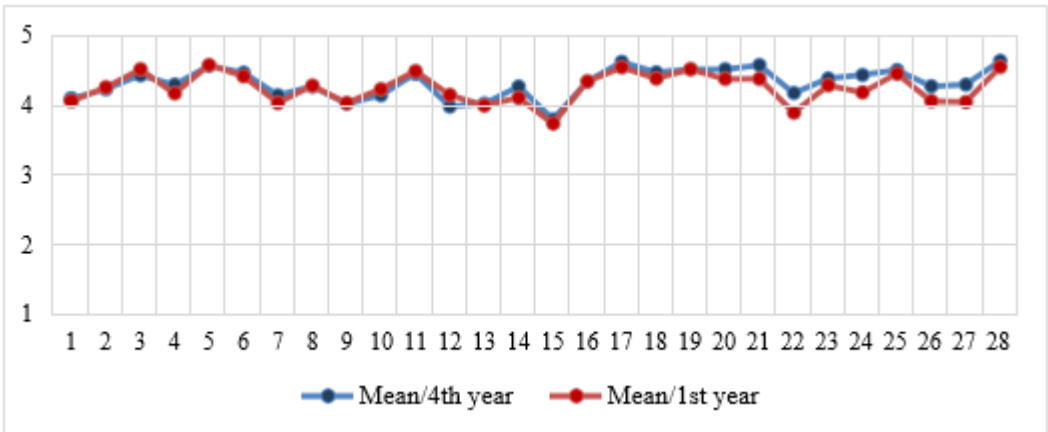
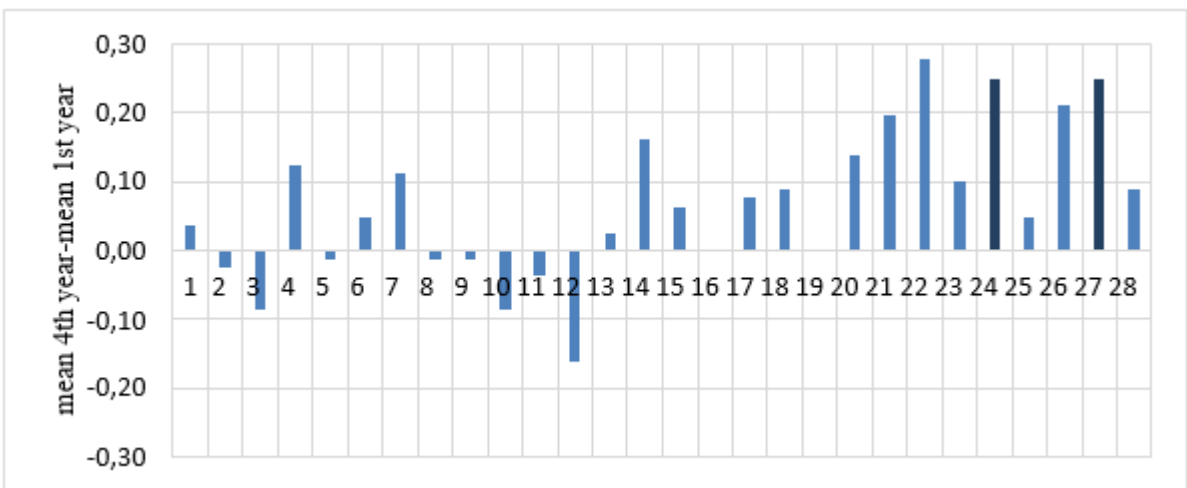


Figure 7

Specific Competencies: Importance (Evolution)



Based on figures 6 and 7, the importance in most specific competencies increased (in 18 out of 28) but only in two of them in a statistically significant way (24), “the competence in collaborative problem solving”, 27, “the ability to design and implement education which integrates people with specific needs”). In two competencies the means remained constant and in eight (8) it decreased. The decrease was not statistically significant.

Frequency. The frequency with which students perceived the promotion of specific competencies by their curriculum was investigated.

Table 6

Specific Competencies: Frequency

Specific Competencies	Mean* (1-5)	Std. D.	Sig. (2-tailed)
Average mean of specific competencies for 4 th year	3.57	0.649	0.000
Average mean of specific competencies for 1 st year	3.15	0.715	

*1 = Very little 2 = Little 3 = Moderate 4 = Much, 5 = Very much

Based on the students' responses, the frequency of encountering specific competencies in the curriculum, from 1 to 4 year, increased in a statistically significant way. This seems to be an expected outcome. However, note that the mean in frequency is less than that of importance. The limitation mentioned in the corresponding point for generic competencies applies here as well.

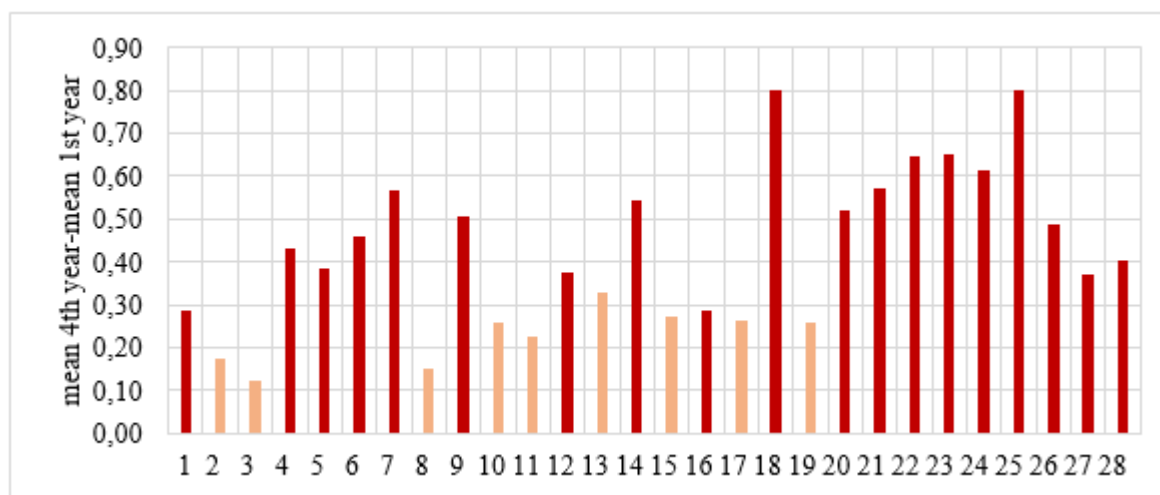
Figure 8 shows that the frequency increases in a statistically significant way in 19 out of 28 specific competencies. In the others the increase is not statistically significant. The nineteen specific competencies are:

- The ability to critically analyse educational theories and issues of policy in a systematic way
- The ability to understand and apply educational theories and methodology as a basis for general and specific teaching activities
- The ability to recognize and respond to the diversity of learners and the complexities of the learning process
- The awareness of the different contexts in which learning can take place
- The understanding of the structure and purpose of educational systems
- The ability to do appropriate research in different contexts
- The ability to manage educational programs, activities and materials
- The ability to understand processes of development and change in the community
- The awareness of the need for continuous professional development
- The knowledge of different teaching and learning strategies with a view to using them in the classroom
- The ability to communicate effectively with groups and individuals
- The ability to create a climate conducive to learning
- The ability to make use of e-learning and to integrate it into the learning environment
- The ability to improve the teaching and learning environment
- The competence in collaborative problem solving

- The ability to adjust the curriculum and educative materials to a specific educational context
- The ability to design and implement varied strategies, based on specific criteria, to evaluate learning
- The ability to auto-evaluation.

Figure 8

Specific Competencies: Frequency (Evolution)



Readiness. Following this, the readiness (self-assessment) of the students in terms of specific competencies was investigated.

Table 7

Specific Competencies: Readiness

Specific Competencies	Mean* (1-5)	Std. D.	Sig. (2-tailed)
Average mean of generic competencies for 4 th year	3.66	0.570	0.020
Average mean of generic competencies for 1 st year	3.44	0.611	

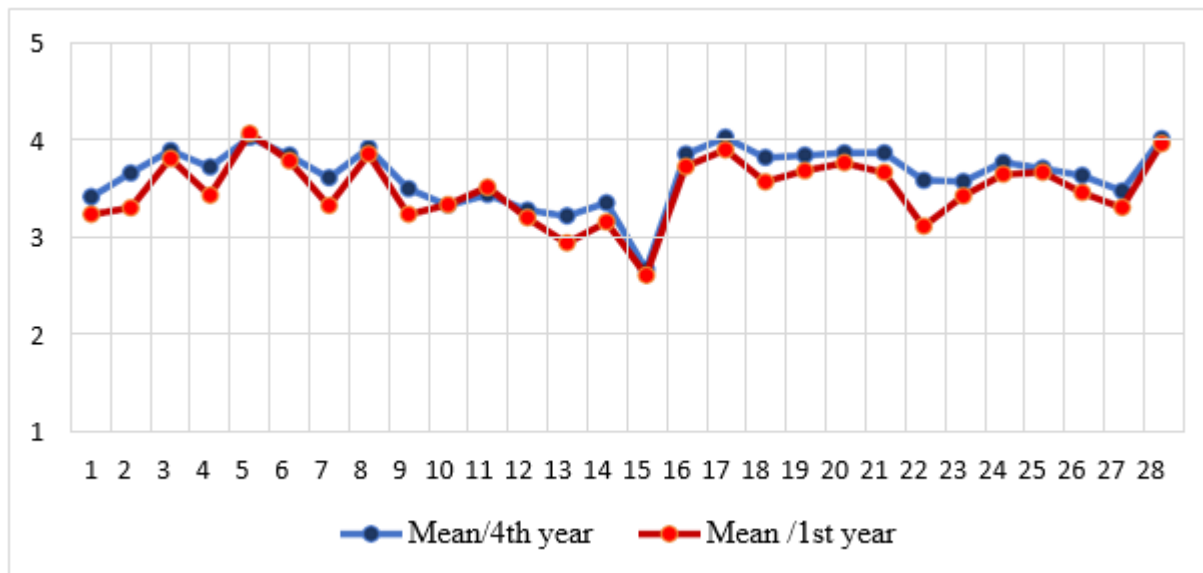
*1 = Very little 2 = Little 3 = Moderate 4 = Much, 5 = Very much

Based on the students' responses, the level of readiness they perceive to have mastered from the curriculum, from year 1 to year 4, increased in a statistically significant way. However, note that the mean of readiness is lower than that of importance and higher than that of frequency. The limitation mentioned in the corresponding point for generic competencies applies here as well.

Figure 9 shows in detail the means of readiness on the specific competencies from year 1 and year 4.

Figure 9

Specific Competencies: Readiness (Analytic)



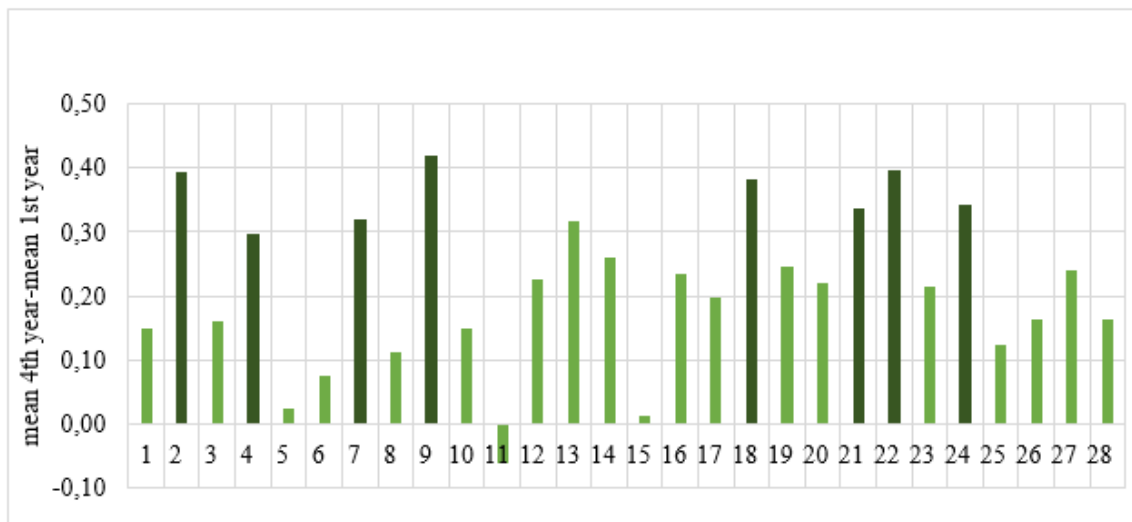
The next figure 10 shows that the means for 27 out of 28 specific competencies have increased. Eight (8) of these showed statistical significance. These are:

- 2. The ability to identify potential connections between aspects of educational theory and educational policies and contexts
- 4. The ability to understand and apply educational theories and methodology as a basis for general and specific teaching activities
- 7. The understanding of the structures and purposes of educational systems
- 9. The ability to do appropriate educational research in different contexts
- 18. The knowledge of different teaching and learning strategies with a view to using them in the classroom
- 21. The ability to create a climate conducive to learning
- 22. The ability to make use of e-learning and to integrate it into the learning environment
- 24. The competence in collaborative problem solving.

One could argue that these eight (8) specific competencies reflect the strengths of the curriculum on student learning.

Figure 10

Specific Competencies: Readiness (Evolution)



Specific competencies: A holistic approach2

Table 8

Specific competencies – Means 4th Year – Ranking in Terms of Readiness

Specific Competencies– 4 th year		Importance		Frequency		Readiness	
1 = Very little 2 = Little 3 = Moderate 4 = Much, 5 = Very much		Mean (1-5)	Std. D.	Mean (1-5)	Std. D.	Mean (1-5)	Std. D.
17	Commitment to learners' progress and achievement	4.62	0.58	3.68	0.98	4.05	0.77
5	The ability to recognize and respond to the diversity of learners and the complexities of the learning process	4.57	0.59	3.89	0.88	4.05	0.85
28	The ability to auto-evaluation	4.63	0.51	3.78	0.92	4.04	0.78
8	The awareness of the different roles of participants in the learning process	4.27	0.74	3.80	0.84	3.94	0.83
3	The ability to provide education in values, citizenship and democracy and reflect on one's own value system	4.43	0.63	3.62	0.95	3.91	0.76

20	The ability to communicate effectively with groups and individuals	4.52	0.61	3.85	0.91	3.89	0.91
21	The ability to create a climate conducive to learning	4.0	0.58	3.80	0.95	3.89	0.85
16	The awareness of the need for continuous professional development	4.35	0.73	3.49	0.94	3.88	0.87
6	The awareness of the different contexts in which learning can take place	4.47	0.63	3.83	0.86	3.86	0.77
19	The knowledge of the subject/ subjects to be taught	4.52	0.59	3.74	0.97	3.86	0.75
18	The knowledge of different teaching and learning strategies with a view to using them in the classroom	4.48	0.57	3.85	0.77	3.84	0.79
24	The competence in collaborative problem solving	4.44	0.67	3.67	0.84	3.79	0.90
4	The ability to understand and apply educational theories and methodology as a basis for general and specific teaching activities	4.30	0.64	3.67	0.92	3.74	0.83
25	The ability to adjust the curriculum and educational materials to a specific educational context	4.51	0.63	3.77	0.81	3.73	0.92
2	The ability to identify potential connections between aspects of educational theory and educational policies and contexts	4.23	0.59	3.42	0.90	3.68	0.82
26	The ability to design and implement varied strategies, based on specific criteria, to evaluate learning	4.28	0.73	3.67	0.88	3.65	0.81

7	The understanding of the structures and purposes of educational systems	4.15	0.74	3.64	0.94	3.63	0.94
22	The ability to make use of e-learning and to integrate it into the learning environment	4.17	0.74	3.52	0.92	3.60	0.87
23	The ability to improve the teaching and learning environment	4.38	0.66	3.63	0.88	3.59	0.82
9	The ability to do appropriate educational research in different contexts	4.02	0.86	3.40	1.00	3.52	0.88
27	The ability to design and implement education which integrates people with specific needs	4.30	0.64	3.43	0.92	3.49	0.84
11	The ability to consult about various educational issues and counselling skills (psychological counselling, counselling learners and parents)	4.46	0.67	3.33	1.02	3.46	0.92
1	The ability to critically analyse educational theories and issues of policy in a systematic way	4.10	0.68	3.60	0.85	3.43	0.79
14	The ability to understand processes of development and change in the community	4.27	0.69	3.37	0.86	3.37	0.91
10	The ability to manage educational/ developmental projects	4.15	0.71	3.23	1.00	3.35	1.04
12	The ability to manage educational programs, activities and materials	3.99	0.79	3.28	0.89	3.30	0.94
13	The ability to evaluate educational programs, activities and materials	4.05	0.77	3.17	0.98	3.23	0.91

15	The ability to lead or coordinate a multidisciplinary educational team	3.80	0.93	2.85	1.23	2.68	1.16
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² For the special competencies the Tuning "Education" Brochure (2009) was used with some adaptations. More specifically:

- a) from 1-11 no change.
- b) 12 was broken in the Greek questionnaire into 12 and 13 to separate the ability to use from the ability to evaluate.
- (c) 13 became 14.
- (d) 14 became 15.
- (e) 15 was not included because we believe that there is no clear differentiation with other competences that have preceded it.
- (f) 16 became 17.
- (g) 18 became 19.
- (h) 19 became 20.
- (i) 20 became 21.
- j) 21 became 22.
- (k) 22 became 23.
- (l) 23 became 25.
- m) 24 became 26.
- 25 became 27.

Finally, the competences that existed in earlier versions were added and in the Greek questionnaire they

In detail, in the 4th year, of the 11 specific competencies with a mean readiness score of around "4", 8 specific competencies also had readiness scores of around "4" in the 1st year (but in all statements the 1st year means are lower than the year 4 means), and only two ("21. The ability to create a climate conducive to learning" and "18" the knowledge of different teaching and learning strategies with a view to using them in the classroom") showed a statistically significant increase in means.

On the other hand, in the 15 specific competencies statements whose means are around 3.50, six of them (24, 4, 2, 7, 22, 9) show statistically significant increases in readiness means.

Looking at the importance, we see that all of the specific competencies means range from "much" to "very much" as they are from 4.05 to "13 the ability to evaluate educational programs, activities and Materials" up to 4.62 in "17 commitment to 'learners' progress and achievement". Exceptions are "12 the ability to manage educational programs, activities and Materials" and "15 the ability to lead or coordinate a multidisciplinary educational team" with lower means than 4.

It is noteworthy that the mean frequency ranges from 3.20 to 3.89 (moderate) for all specific competencies except "15 the ability to lead or coordinate a multidisciplinary educational team" which has a mean of 2.85.

The readiness of each specific competencies seems to be influenced by the importance and frequency respectively, in "adequate" ($0.188 < R^2 < 0.455$) and statistically significant regression models (F-test, $p \leq 0.01$), except for statement 11.

Among the 28 specific competencies, only 13 show a statistically significant effect of importance on readiness, while all effects of frequency on readiness are statistically significant effects (t-test, $p \leq 0.05$).

Also, of the 28 specific competencies in 26 statements the effect of frequency is greater than the effect of importance on readiness for 4th year students, except for "3 the ability to provide education in

values, citizenship and democracy and reflect on one's own value system" and "17 commitment to learners' progress and achievement".

Discussion

The construction of curricula grounded on competency-based learning outcomes has been a radical change in curriculum construction ideas for higher education. The consideration and the use of learning outcomes have not been convergent and diverse considerations thus applications have been proposed. The accumulated experience leads, over time, to convergence and coordination. However, the most difficult point seems to be the link between curriculum design on the basis of obtained learning outcomes and the assessment of the learning process, i.e. the monitoring of the learning outcomes. At this point, it is crucial involving students, since the learning outcomes logic operates in the context of student-centred learning.

Consequently, students should also express an opinion on the final product of their learning, i.e. the acquisition of the expected learning outcomes.

As for the first approach, the main results were based on the research questions:

1st research question: Do students consider Tuning competencies appropriate for their field of study?

Generic competencies

Students considered the importance of the generic competencies proposed by Tuning, for their studies both at the beginning and at the end of their studies. This consideration did not change during four years of study except for four of the twenty-four generic competencies and this in a negative way.

Specific competences

Students considered the specific competencies suggested by Tuning important, for their studies both at the beginning and at the end of their studies. This consideration did not change during 4 years of study except for two competencies that they consider most important.

2d research question: Have students encountered activities in their curriculum related to these competencies?

Generic competencies

- Students encountered the generic Tuning competencies during their studies, with the (partially) exception of one.

Specific competences

- Students encountered all of Tuning's specific competencies in their curriculum.

3d research question: Have students developed these competencies? ("Self-evaluation").

Generic competencies

- Students (differentially) developed the generic Tuning competencies except for one. In nine of these the development was statistically significant.

Specific competences

- Students (differentially) developed the Tuning specific competences. In eight of them the development was statistically significant.

This research complements an earlier one which focused only on last semester students. In that research (Stamelos & Evangelakou, 2018b) it was visible that students can express a credible judgment about the content of their studies under the condition that they are given a frame of reference (expected learning outcomes). However, its synchronic dimension limited the understanding of the process of acquiring learning outcomes. A longitudinal study was needed where a comparison was made between students' competences at the beginning of their studies (1st semester) and at the end (8th semester). This is the innovation of this paper and its result brings something new: students arrive at university with developed competences from their earlier studies. An element that is rarely taken into account in the design of expected learning outcomes.

Indeed, the results of this survey (which was influenced by the pandemic) initially showed information that was not often taken into account by program designers. Students do not arrive in higher education as a *tabula rasa*. Instead, they seem to come with developed competencies and - at least in the case of positive study choices - with formed perceptions and expectations. Indeed, in the case of this study, these perceptions do not seem to be significantly modified during their studies. Is this due to the strength of the perceptions or the inability of the curriculum that have a strong effect on the students who follow it? The answer to this needs further research. Nevertheless, there are already some indications. The importance seems to have a greater effect on the readiness in generic competencies. In contrast, the frequency seems to have a greater effect on specific competencies (Stamelos & Evangelakou, 2019).

As a result, the impact of the program is more specific than in generic competencies. This is perhaps due to the fact that the specific competencies are those which, as specialised, are, on the one hand, developed by the curriculum and, on the other hand, perceived by the students as something new that they did not know. In contrast, generic competencies, by their conception, may have been developed or are developed outside the curriculum, from students' prior formal and non-formal education and from student life in general. Therefore, even if they are promoted within the curriculum, they are not directly linked to it by students.

This finding has also another dimension. In several related research studies especially in the sciences and engineering (Aziz et al., 2012), what graduates and/or undergraduates report is their difficulty in meeting university knowledge to the extent that there were prior deficits. In the proposed research, which concerns teacher education, it seems that students through their school experience have already developed, mainly, some generic competencies or in any case the competencies of the specific study programme seem familiar to them and a continuation of previous school studies (e.g. the ability to live and cooperate in an intercultural environment are a developed competence to the extent that the school experience has already brought university students (former school students) into coexistence and cooperation in a multicultural group). Our research rather comes to confirm findings of other studies that show that the introduction of learning outcomes makes students' learning process more autonomous (Mahajan & Singh, 2017).

Conclusions

Based on the self-assessment (of 4th year students), the average mean for generic competencies was 3,84 and for specific competencies 3,66. Twelve (12) generic and fifteen (15) specific competencies had a mean more than the average.

Table 9

The Most Developed Competencies Between the 4th Year Students (More Than the Total Average Mean)

Generic competencies	Specific competencies
The ability to act on the basis of ethical reasoning	The commitment to learners' progress and achievement
The appreciation of and respect for diversity and multiculturality	The ability to recognize and respond to the diversity of learners and the complexities of the learning process
The ability to evaluate and maintain the quality of work produced	The ability to auto-evaluation
The ability to communicate both orally and through the written word in native language	The different roles awareness of participants in the learning process
The ability to work autonomously	The ability to provide education in values, citizenship and democracy and reflect on one's own value system
The ability to be critical and self-critical	The ability to communicate effectively with groups and individuals
Interpersonal and interaction skills	The ability to create a climate conducive to learning
The capacity to learn and stay up-to-date with learning	The awareness of the need for continuous professional development
The ability to work in a team	The awareness of the different contexts where learning can take place
The capacity to generate new ideas (creativity)	The knowledge of the subject/ subjects to be taught
The ability to search for, process and analyse information from a variety of sources	The knowledge of different teaching and learning strategies with a view to using them in the classroom

The ability to work in an international context	The competence in collaborative problem solving
	The ability to understand and apply educational theories and methodology as a basis for general and specific teaching activities
	The ability to adjust the curriculum and educational materials to a specific educational context
	The ability to identify potential connections between aspects of educational theory and educational policies and contexts

For that reason, this table also demonstrates the competencies that are most (and best) promoted by the curriculum. Could this be an indication of an evaluation for a curriculum? This needs attention. What is more certain is that student seemed to perceive which competencies are given more importance by the programme they attend, and which ones are useless? Therefore, if the programme designers would like to develop the other competencies as well, they would have to think of specific educational activities within the programme to achieve this.

Finally, it should be noted (see the research methodology) that the difference in sample size may be a limitation in reading the given results.

Suggestions for Future Research

The main prospects for future research emerge from specific findings of the presented research as well as from its initial limitations. Firstly, the repetition of the survey or other similar ones outside the circumstances of the COVID-19 pandemic is considered of great interest. It resulted to the student's absence from their normal educational environment for a long period of time and therefore probably influenced both the degree of achievement of learning outcomes and their students' perception. It would also be interesting to repeat the research in other disciplines beyond Educational Sciences and even in disciplines with different methods of education, such as clinical training, more intensive laboratory training or subjects of purely theoretical education. Besides the other disciplines it would be of research interest to reprise this research in the same discipline (Educational Sciences) but in another department or even in a different context. An additional question could be investigated with a different research design, whether students acquire the expected learning outcomes not on the basis of their own perception, but on the basis of assessment criteria of students going beyond their self-assessment. The existence of competencies related to learning outcomes in real-life contexts could be also investigated.

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