Principles of economic theory: an anachronistic school textbook in Greek educational system?

Ioannis Sitzimis[•]

Abstract

In the Greek educational system, students of the third grade of general and vocational high schools, who wish to enter higher education institutions with an economic orientation, must choose the scientific field "economics and computer sciences". In this field, one of the most important subjects examined is 'Principles of Economic Theory'. It was introduced in the panhellenic examinations in 2000 and is still in existence today. The textbook of the course has not undergone any changes and according to many economists it contains anachronistic information and knowledge. In this context, the Greek Ministry of Education decided to introduce a new course entitled "Principles of Economic Science" from the school year 2025-2026 and consequently to write an updated textbook. In this paper we evaluate the adequacy of the old textbook to determine, on the one hand, whether the change in the curriculum was necessary and, on the other hand, whether its replacement in secondary education was correct. Through descriptive statistics and inferential testing and using the prefecture of Rethymno, Crete, as a case study, we cross-check the attitudes of students and economics teachers towards the textbook, to draw our conclusions.

Keywords: panhellenic examinations, school textbook "principles of economic theory", evaluation method.

1. Introduction

The course "Principles of Economic Theory" is taught in the third grade of General (GEL) and Vocational high schools (EPAL) in Greece. It is related to the basic concepts of economic science and is a prerequisite for students who wish to enter higher education institutions of economic direction. It was first admitted to the Panhellenic exams in the year 2000 under Law 2525/1997 and was maintained with Laws 4186/2013 and 4327/2015. Nowadays, it belongs to the orientation group "economics and computer sciences", according to Law 4692/2020 ("school upgrade and other provisions") (www.minedu.gov.gr). The content of the course describes various economic problems that concern a society (what will be produced, how it will be produced, how it will be distributed, how the quantity produced will increase). It consists of two main pillars:

[•] Assistant professor, Department of business administration & Tourism, Hellenic Mediterranean University, Heraklion, Greece. e-mail: isitzimis@hmu.gr

chapters 2-6 include microeconomic theory (how the prices of goods are determined by the forces of supply and demand) and chapters 1 & 7-11 macroeconomic theory (understanding the economy as a whole) respectively.

The main objective of this article is the evaluation of the school textbook "Principles of Economic Theory", which is used in the examination process of the panhellenic exams from the year 2000 until today. This is an anachronistic book, which in the opinion of many economists needs to be replaced (www.alfavita.gr). In this context, the ministry of education decided a radical change in the course curriculum, within the next three years (2025-2026). The course will be renamed to “Principles of economics” and a new updated textbook will be written (Government Gazette 3317/28.06.2022 issue B'; www.esos.gr; www.protothema.gr). Using the prefecture of Rethymno as a case study, we cross-check the attitudes of high school students and public sector economics teachers, in order to exact our conclusions and evaluate whether this ministry’s effort is correct.

The proposed research is both original and unique in Greece, while leaving great room for further deepening in the future. In the Greek pedagogical literature, there are significant gaps in the evaluation of this textbook. Especially now that the decision of the ministry of education is to replace-update it, this evaluation is considered necessary to determine its correctness. We hope that the proposed evaluation method will deepen more into existing knowledge and expand the analysis of either the old or the new textbook both in other Prefectures of Crete and in the rest of Greece.

In particular, the main research questions we attempt to answer are:

- What are the attitudes of students and economics teachers towards the textbook "Principles of Economic Theory", based on its content, structure and organization, language, didactic and pedagogical suitability, and typographical appearance?

- Are the above five factors of evaluation of the textbook 'Principles of Economic Theory' related to each other and in which direction?

- Does the gender and the school type, of economics teachers in the Prefecture of Rethymno, influence the evaluation grade of the textbook "Principles of Economic Theory"?

- Is there a difference between economics teachers of the Prefecture of Rethymno of different ages, degrees, area of work, employment relationship and years of service in terms of the evaluation grade of the textbook "Principles of Economic Theory"?

2. Literature review

Banaszak (1987) states that economics is not only a body of knowledge but also a way of thinking about phenomena. Economics courses in secondary education and the quality of the corresponding services have been rated low by both students and universities (Colander, 2017) (Hansen, 2013). The main reason according to Finegan & Siegfried (1998) is the connection between economics, mathematics and statistics, elements that make it difficult for high school students (Cohn, Cohn, Balch, & Bradley, 2001). In relation to universities, the "poor" performance of students is due to the fact that they have integrated some economics courses (e.g. microeconomic and macroeconomic theory) into scientific fields that do not fit perfectly (nursing, management, law, polytechnic schools, etc.) (Hansen, 2001) (Salemi & Siegfried, 1999). Brasfield et al (1993) and Durden & Ellis (1995) concluded that students of microeconomic and macroeconomic theory who had taken economics courses in high school read less, assimilated the material better and had higher grades.

Buckles (1991) pointed out that since economics education aims to use economic concepts in a logical way to adequately analyze individual and social economic issues, what matters is the "method" of teaching economics. Loabuchi (2017) considers that the most common technique for teaching economics is the traditional lecture method, even if other methods that require students' active participation in the lesson have been proposed. However, according to Walstad (2001), the results with regard to the effectiveness of these alternative forms of teaching vary.

In the Greek pedagogical literature, a doctoral thesis conducted in 1991 to determine the economic knowledge of senior public high school students in Macedonia (Makridou-Bousiou, 1991). It emerged that there is on the one hand a low level of economic knowledge and on the other hand an understanding of broader economic concepts due to economics courses. Samaras (2003) stressed the need for innovative change in the teaching of economics courses by proposing literary texts as one of the teaching methods. New technologies and their use in the teaching of economics courses in secondary education, with emphasis on the effectiveness of online education were adequately emphasized by Tyrovouzi (2006). Magoula (2009) thoroughly analyzed the educational reforms and timetables of economics courses in Greek secondary education, from 1929-2009. After explaining the methods-techniques of microteaching in the classroom, she focused (2019) on the microteaching design of an economics course. An innovative proposal was submitted by Brinia et al (2015) (Brinia, Kalogri, & Stavrakouli, 2016) suggesting that the course "principles of economic theory" should be taught through background music. A historical review of Greek economic education was also made by Whitehead (2006). Kekhaidou (2011) compared the teaching of economics courses between GEL and EPAL, while Brinia & Vikas (2011) found that the appropriate teaching method contributes to a more effective understandin of economic phenomena, allowing students to better interpret economic concepts.

In a survey conducted for the secondary school economics course "Principles of business organization and administration", in GEL of Piraeus (2004), the effectiveness of the "Project" teaching method was recorded based on the results of the panhellenic examinations of 2004 (Brinia, 2007). This analysis was further extended in 2010 (Brinia & Chrysafidis) when the authors argued that the application of the method is indeed feasible at the high school level, despite the difficulties under the prevailing conditions. In another survey conducted by the Pedagogical Institute (2005) among 367 high schools, 7,500 students and 400 teachers, it was concluded that economics courses contribute cognitively to the socio-economic behavior of individuals, with one third of the respondents considering economics as their most favorite subject (Magoula, 2009).

Therefore, although in recent years there has been increased attention paid to secondary school economics courses, there are significant gaps in didactic research (regarding the attitudes and behaviors of stakeholders) for the course "Principles of Economic Theory". This gap in the Greek pedagogical literature will be covered by the present study. Central to this analysis is the course book and its subsequent evaluation.

The teacher in his/her effort to organize the teaching and learning process uses the course book more than any other teaching tool (Katsarou & Dedouli, 2008). It has been estimated that in the context of a teaching hour most of the time (80-95%) is taken up by the use of the textbook (OEPEK, 2008; Johnsen, 1993). It determines about 70% of educational activities (Weiss, 1998). The evaluation of textbooks is of paramount importance and is seen as an ongoing educational process. It takes place during their writing, approval, introduction and use in the teaching process. According to Bonidis (2005), the purpose of evaluation is to improve and revise textbooks, while according to Konstantinou (2002), the purpose of evaluation is to draw up new Curriculum to produce both new textbooks and additional theoretical approaches.

Richaudeau (1979), analyzed and evaluated textbooks in terms of a) content, b) transferability of content to the reader, c) adaptability to learning needs and d) materiality. Chiappetta, Fillman & Sethna (1991) focused on a) understanding and encouraging knowledge acquisition, b) cultivating critical thinking, and c) the two-way relationship between science and society. Trilianos (1999) based his evaluation on four axes of evaluation related to content, presentation, didactic and methodological dimension and the interaction of the textbook with the curriculum. The same was done by Tsolakis (2005), targeting the content, structure and presentation of the material and the connection with contemporary society and its values. Scientific validity, reliability and transparency, didactic and pedagogical appropriateness were addressed by Xochellis (2005), while similar criteria were used by Kapsali, A. & Charalambous (2008).

Special mention should be made to a study carried out by the Pedagogical Institute of Greece (Konstantinou, 2002), where 141 textbooks for primary and secondary schools were evaluated (161 schools were visited and 3,367 questionnaires were collected). The five main evaluation axes that emerged were: a) content, b) structure and organization, c) language used, d) didactic and pedagogical suitability and e) typographical appearance. This paper is largely based on this research analysis. We consider that its main axes comprehensively describe the results and findings of the scientific search around the issue, fully cover our research objective and meet all the criteria necessary for the evaluation of a textbook.

3. Research methodology

As is well known, the population in a survey is the total number of subjects (Dimitriadis, 2016). In our study, we focused on GEL and EPAL of Rethymno Prefecture (there were 11

GELs and 1 EPAL of economic direction in total). We had census research data of economics teachers teaching the course (16 in total) and communication with students was easy (school year 2021-22). The survey for teachers was conducted between September and November 2021 and for students between November 2021 and January 2022.

The main research method used was a "case study" of a single geographical area (Rethymno Prefecture). This targeting allowed us to make detailed observations, something that cannot be done with large samples (e.g., at a national level) without high costs (Schindler, 2019). Also, the method is useful, as it can expand the study to other prefectures in Greece. The chosen research strategies involved both the "qualitative method" (interviews) and the "quantitative method" (questionnaires) (Saunders, Lewis, & Thornhill, 2019). In our case, the research design included both qualitative (gender, marital status, region of residence, etc.) and quantitative (age, years of service, etc.) characteristics. Therefore, we conducted a mixed-methods study, where we combined quantitative and qualitative data collection techniques and corresponding analytical procedures (Schindler, 2019).

Students were given semi-structured face-to-face interviews. Initially they were asked specific questions and then we followed their train of thought. This method offered flexibility and immediacy. We achieved the collection of valid and reliable data relevant to our research questions and objectives. It is worth mentioning the high response rate they show (Babbie, 2018). The students' individual choices (opinions, perceptions, interpretations) conveyed their realistic experience of the course (Magoula, 2019; Whitehead & Makridou-Bousiou, 2006; Sitzimis, 2011). Possibly the interviews also helped to improve our ideas, as there was an exchange of constructive views with respondents (Callas, 2015).

Specifically, we randomly selected 12 high school students from the prefecture of Rethymno (one per school and in relation to gender we followed an equal percentage ratio) (school year 2021-22). That means we followed the quota sampling method (even though in qualitative research the representativeness of the sample is not considered necessary). Our sampling units were selected based on predefined characteristics, so that the total sample has similar characteristics to the general population (Callas, 2015). We knew that the proportion of boys and girls in relation to the general population is approximately 50:50. According to data from Hellenic statistical authority (school year 2018-19), in the total number of Greek students who took the Panhellenic examinations choosing the economic direction, 62% were girls and 38% were boys. In the prefecture of Rethymno these percentages were 58% and 42% respectively (297 students in total) (www.statistics.gr). The sample was therefore selected approximately based on this ratio, i.e. 6 boys and 6 girls (12 students in total) (Babbie, 2018).

The semi-structured interviews were on-site and relevant to the structured questionnaire. The difference was that we collected different and more information (56 questions in total). Respondents answered a series of questions (closed and open-ended) whose number, order and content were predetermined by the interview protocol form. All participants were asked the same questions, in the same words, in the same order and in the same neutral manner (Babbie, 2018). The interviews were not recorded, but were recorded verbatim, as were any pauses in speech or any jokes.

In particular, the interview structure included three parts:

- The first part contained 3 open-ended questions about the demographic characteristics of the interviewees.

- The second part contained 48 closed-ended likert-type questions, exactly as asked to the economics teachers of the prefecture of Rethymno (some questions were removed in order to adapt the questionnaire to the students).

- The third part contained 5 open-ended questions, where participants were asked for their views on the five main categories of textbook evaluation used in this research.

Structured questionnaires with likert-type questions were distributed to the teachers via the internet (google forms), in order to measure the variables of our conceptual framework and the relationships between them (Magoula, 2009; Whitehead & Makridou-Bousiou, 2006; Saunders, Lewis, & Thornhill, 2019; Argyropoulou, 2018). With the structured questionnaire we achieved to collect useful data and information in a very short time. Compared to other research tools, it is minimally costly (time, money effort) and the researcher, without interference, often gets honest answers to subtle questions (Babbie, 2018). We chose online questionnaires as the target population had computer literacy, there was certainty that the right person was answering, there was little chance of distortion of the respondent's answers, the questionnaire was presentable and readable, and automatic data entry resulted (Zafeiropoulos, 2015).

For the economics teachers, a "full census" was conducted due to the small size of the target population (<30) (Dimitriadis, 2016). 16 questionnaires were sent online to the 16 economics teachers of the prefecture of Rethymno. The main advantage of the census is the absolute validity of the results, since there are no sampling errors (Dimitriadis, 2016).

The design of the questions included:

- 67 closed-ended quantitative likert-type questions, to measure the variables of our conceptual framework and the relationships between them.

- The division of the questionnaire questions into six categories: a) the category related to the respondents' individual characteristics (8 questions), b) the category "book content" (13 questions), (c) the category "book structure and organization" (13 questions), d) the category "language of the book" (5 questions), e) the category "didactic and pedagogical suitability of the book" (19 questions), f) the category "typographical appearance of the book" (9 questions)

Our overall aim was to tap into the experience and knowledge of the teachers through more detailed and specific questions and then to cross-check their answers with the students' general views on the book, through a freer discussion and taking advantage of their spontaneity and youthfulness.

4. Descriptive statistical analysis of data and results

α. Analysis of the teachers' structured questionnaire

The SPSS statistical program (Gardellis, 2013; 2019) was used to analyze the teachers' structured questionnaire. The descriptive statistics were divided into five categories: a) the category "book content", b) the category "book structure and organization", c) the category "language of the book", d) the category "didactic and pedagogical suitability of the book", e) the category "typographical appearance of the book". For each question of each category, the minimum and maximum value of the answer, the mean, the median, the mode and the standard deviation were recorded (Dimitriadis, 2016). At the same time, the percentage distribution of the answers was used based on the 5-point likert scale. At the end, the means of the measures of central tendency and variance were extracted.

It should be noted that the application of the "mean" for drawing conclusions is not an appropriate methodology (Dimitriadis, 2016). As a measure of central tendency, it is not meaningful in ordinal variables. After all, how could we derive a mean between the responses "strongly disagree" and "strongly agree" or how would we consider the emotional distances between "strongly disagree-agree" and "agree-strongly agree" to be equal. Moreover, respondents are several times reluctant to take a clear position and give more weight to the "neutral" response. However, we found that the median and the mode (indicated in ordinal variables), were consistent with the "mean" results in all analyses. We therefore used it as a key analytical tool as it makes the drawing and interpretation of conclusions, clearer to the reader and facilitates our analysis.

The survey population consisted of 5 men (31.3%) and 11 women (68.8%). Most of them belonged to the age category 41-50 years old (43.8%). They were mainly holders of postgraduate degrees (68.8%) and worked in urban areas (62.5%) in the city of Rethymno (75%). 68.8% of the respondents worked in a GEL (68.8) and most of them had both a permanent employment relationship (75%) and 11-20 years of experience in the field (68.8%).

Considering that responses 1 to 2 express respondents' dissatisfaction, response 3 expresses neither satisfaction nor dissatisfaction and responses 4 to 5 express satisfaction, we arrived at table 1 and the following related conclusions:

1. Based on the average of the "mean" values of the responses (mean), the highest dissatisfaction of the respondents is expressed for "didactic and pedagogical suitability" (2.48) and the highest satisfaction for "language" (3.66). In no category did the result exceed the value of 3.66, i.e. no strong satisfaction was expressed by the participants.

2. The mean value of the variable (response) with the highest frequency (mode) appears in "language" (3.8) and the lowest in "didactic and pedagogical suitability" (2.26).

3. The average of standard deviations in all evaluation categories ranges from 0.71 to 0.88. This shows that most results are between 0.71 and 0.88 points from the

corresponding mean. Some researchers believe that 70% of all scores fall within one standard deviation of the mean (Dancey & Reidy, 2020). For example, in "language", a value of 0.71 indicates that almost 70% of the participants responded between 2.95 and 4.37.

4. The percentages of "strongly disagree" to "neutral" responses are particularly high for all categories, reaching 82.31% for "didactic and pedagogical suitability" and 75.07% for "typographical appearance". Only in the "language" category do the answers "agree to strongly agree" (59.96%) predominate. The teachers' concern about the quality and adequacy of the textbook is evident.

Table 1.The evaluation of the school textbook "Principles of Economic Theory" by the teachers of the prefecture of Rethymno

	Measures of central tendency and variance				*Response rates*	
Evaluation criteria	*Mean*	*Mode*	*Median*	*Std.Deviation*	*Strongly disagree-neutral*	*Agree-strongly agree*
Content	3,22	3,23	3,31	0,82	58,22%	41,78%
Structure and organization	3,06	3,00	3,00	0,80	58,74%	41,26%
Language	3,66	3,80	3,80	0,71	40,04%	59,96%
Didactic and pedagogical suitability	2,48	2,26	2,32	0,88	82,31%	17,69%
Typographical appearance	2,73	2,67	2,72	0,86	75,07%	24,93%

Based on the percentages of responses ranging from "strongly disagree" to "neutral", i.e. the expression of dissatisfaction with the adequacy of the textbook, we concluded that we could rank the dynamics of their objections in descending order as follows: (1) Teaching and pedagogical suitability, (2) Typographical appearance, (3) Structure and organization, (4) Content, (5) Language.

To establish the reliability of the structured questionnaire given to the teachers, we used the Alfa (Cronbach's a), Split-Half and Guttman models (Anastasiadou, 2012). The assessment was done separately for each of the five categories of the questionnaire. All three models confirmed the internal consistency of the questions in all scales of the questionnaire (values greater than 70%). At the same time, we considered testing the validity of the conceptual construction of the questionnaire through confirmatory factor analysis. The aim was to verify the correctness of the selection of all questions per assessment axis (scale) and to see which of the axes (scales) are best adapted to the census data we have on the attitudes of economics teachers in the prefecture of Rethymno. Then and after the analysis was completed, we would calculate the factorial scores, which appear as new variables and can replace the original variables in other multivariate analysis methods such as t-test, regression, analysis of variance, etc. (Dimitriadis, 2016). However, this analysis was not conducted due to the small number of participants in the study. A prerequisite for the application of the above method is that the participants-variable ratio should be at least 5:1 (Anastasiadou, 2012; Markos, 2012). Besides, the original questionnaire (Konstantinou, 2002) was obtained after factor analysis, and we will not question the latent variables that were obtained.

β. The analysis of semi-structured student interviews

After collecting the qualitative data from the semi-structured student interviews, we proceeded to analyze them. We recorded their demographic and social characteristics and moved along two main axes. In the first strand, we studied in the same way, as the teachers, their responses to the closed-ended questions (the questions were the same, with small adaptive deviations). That is, we recorded measures of central tendency and variance. Our aim was to find differences or similarities in teacher and student attitudes over the five categories of evaluation. In the second degree, we studied students' responses to the open-ended questions of the semi-structured interview. After we had recorded all the data on paper, we read and reread them to recall and understand the most useful ones. The aim was to gain a comprehensive understanding of the participants' views. We then proceeded to coding, giving representative codes to larger sections of the text. Feelings of anxiety, joy, satisfaction, dissatisfaction, indifference, and difficulty in understanding were attempted to be elicited by textbook evaluation category. They were then contrasted and compared with each other to identify codes with similar characteristics or meanings. The identification of similar codes helped us to conclude how students interpret, perceive, and experience the reading of this particular textbook.

The sample of students in the study consisted of 6 boys (50.0%) and 6 girls (50.0%). The majority of them resided in urban areas (66.7%) in the city of Rethymno. 58.3% of students expressed a preference for schools of management and economic sciences, 8.3% for schools of computer sciences, 8.3% for schools of production and management engineering, 8.3% for military schools and 16.7% for police schools.

The analysis of the closed-ended questions revealed that (Table 2):

1. Based on the average of the "mean" values of the answers (mean), the highest dissatisfaction of the respondents is expressed for "teaching and pedagogical suitability" (2.87) and the highest satisfaction for "language" (3.50). In no category did the result exceed the value of 3.50, i.e. no strong satisfaction was expressed by the participants.

2. The mean value of the variable (response) with the highest frequency (mode) occurs in "language" (4.00) and the lowest in "typographical appearance" (2.67).

3. The average of standard deviations in all evaluation categories ranges from 0.87 to 1.31. This indicates that most results are between 0.87 and 1.31 points from the corresponding mean.

4. The percentages of "strongly disagree" to "neutral" responses are relatively high for two of the five categories, reaching 67.71% for "didactic and pedagogical suitability" and 60.16% for "typographical appearance". The categories "language", "structure and organization" and "content" are dominated by "agree-strongly agree" with percentages

of 62.53%, 54.18% and 51.21% respectively. The students' concern about the quality and adequacy of the textbook is evident.

We concluded that we could rank the dynamics of their objections in descending order as follows: (1) Teaching and pedagogical appropriateness, (2) Typographical appearance, (3) Content, (4) Structure and organization, (5) Language.

From a total of twelve semi-structured student interviews that took place, only six of the open-ended questions provided clearly usable results for our research. We therefore relied on them. These were four girls and two boys. Regarding the "content" of the textbook, the predominant opinions of the respondents are relatively positive, but they are related to the immediate and required updating of the textbook. Some respondents' observations show the psychological and educational pressure on students due to their participation in the panhellenic examinations. The "structure and organisation" of the textbook is considered satisfactory by the participants, with one important observation being of concern to most of them. Chapter one of the textbook, which deals with the productive potential of the economy, is located together with the chapters on microeconomic rather than macroeconomic theory. The "language" of the textbook is generally described as simple and understandable, adapted to educational needs. As regards "didactic and pedagogical suitability", students express their objections (mainly the absence of student-teacher interaction and of exercise-solving methodologies) but in general they consider the textbook to be relatively suitable for the educational process. The "typographical appearance" of the textbook, considered to be inconsistent both in terms of color and graphics with their young age.

Table 2. The evaluation of the school textbook "Principles of Economic Theory" by the students of the prefecture of Rethymno

	Measures of central tendency and variance				*Response rates*	
Evaluation criteria	*Mean*	*Mode*	*Median*	*Std.Deviation*	*Strongly disagree-neutral*	*Agree-strongly agree*
Content	3,33	3,29	3,43	0,87	48,79%	51,21%
Structure and organization	3,42	3,75	3,58	1,07	45,83%	54,18%
Language	3,50	4,00	4,00	1,31	37,48%	62,53%
Didactic and pedagogical suitability	2,87	2,88	2,91	1,00	67,71%	32,29%
Typographical appearance	3,21	2,67	3,11	1,04	60,16%	39,84%

5. Inferential statistical analysis of data and results

As is well known, inferential statistics is applied when we want to generalize the findings of our sample to the general population. In the case of census data, this need does not exist because we have all the required data. The point here is to explain by subjective criteria both the cause of the deviation and whether it is a large deviation with a particularly practical significance for our analysis. On the other hand, the statistical analysis applied to census data involves descriptive statistics and perhaps some correlation analysis. The question is whether the p-value should be used to draw conclusions. This value indicates the probability that the emergent relationship between the different variables is random and has no statistical significance. In the census the inference is absolute and cannot be due to randomness.

We ended up considering, the census of sixteen economics teachers of the prefecture of Rethymno as sample data of a larger hypothetical population. This could refer to the corresponding teachers of future periods. After all, the classical quantitative analysis, where the conclusions drawn from the sample are extrapolated to the population, is nothing more than a representation of the moment. Of course, the sampling in this case would not be random and would not be based on probability (convenience sample). However, in order to best answer our research questions, we performed several parametric tests such as the Pearson correlation coefficient, the t-test for independent samples, and the anova test.

Accepting the validity of the questionnaire, we started with the factorial score of each latent variable by summing the responses of the respective questions. In this way we created five new continuous variables, which could be used to calculate correlation coefficients between them. At the same time, we checked whether there is a normal distribution of the data. The test for normal distribution was performed with the Shapiro-Wilk criterion which is commonly used in studies with small samples ($n<20$ or 30). In our case it matched the number of our census data (16). We found that our data followed the normal distribution, as the Shapiro-Wilk test showed p-values for all five variables>0.05. The same results were obtained by the skewness and kurtosis tests. The z absolute values of skewness and kurtosis (for $n<30$) were everywhere less than 1.96 (Papaioannou, Zourbanos, & Minos, 2016).

Therefore, the correlation test to be performed was parametric and as all the conditions for the Pearson coefficient were met, it was the one finally chosen. Our main objective was to determine whether there is a statistically significant relationship and in which direction between the five evaluation factors. The results showed that all variables show at least low correlation ($r>|0.2|$) between them (Evans, 1996). For the combinations "content-didactic and pedagogical suitability" ($r=0.581$) and "content-typographical appearance" ($r=0.570$), there is a moderate positive correlation ($|0.4|<r<|0.59|$), while for the combinations "structure and organization-didactic and pedagogical suitability" ($r=0.768$), "structure and organization-typographical appearance" ($r=0.762$) and "language-typographical appearance" ($r=0.770$) the correlation is high and positive ($|0.6|<r<|0.79|$). Indicatively, this means that the more positive the respondents' perception of the "language" used in the book, the more positive their perception of the "typographical appearance". A very high positive correlation ($r>|0.8|$) is evident between the variables "content-structure and organization" ($r=0.805$). Interestingly, no negative correlations are found at all. We would say that respondents have either positive or negative attitudes towards all five underlying variables of the questionnaire. As shown in the descriptive analysis, the general tendency towards the textbook is negative.

In fact, if we assume a wider future population of economics teachers for the prefecture of Rethymno, then we would note that with a two-sided test and a significance level of $\alpha=0.05$, most of the above correlations are statistically significant (p-value<0.05). Only the combinations "teaching and pedagogical suitability-language" and "content-language" show the existence of a non-statistically significant relationship between them.

We then proceeded to test normal distribution by categorical variable for all five evaluation factors. We found that the sample followed the normal distribution, as the Shapiro-Wilk test showed for all categories of independent variables that p-value > 0.05. This meant that we had to re-use Pearson's correlation coefficient r to analyze the degree of correlation of the five evaluation factors by independent variable group.

In relation to "gender", males show statistically significant (p-value<0.05) very high positive correlation between the factors "structure and organization" and "content" ($r=0.923$), while females between the factors "typographical appearance" and "structure and organization" ($r=0.873$). Ages 31-40 correlate positively and very highly between the factors "structure and organization" and "content", ages 41-50 between the factors "typographic appearance-structure and organization" ($r=0.842$) and "typographic appearance-language" ($r=0.811$), and ages >50 between the combinations "structure and organization-content", "typographic appearance-content", "typographic appearance-structure and organization", but the relationships do not appear statistically significant (p-value<0.05). Teachers with a second-degree correlate "structure and organization" with "content" very highly ($r=0.970$, p-value<0.05), while those with a master's degree correlate both the "typographic appearance-language" ($r=0.823$, p-value<0.05) and "didactic and pedagogical suitability-structure and organization" ($r=0.855$, p-value<0.05). Regarding the "working area", statistically significant correlations do not appear for those living in urban and semi-urban areas. In urban areas, teachers have a very high and positive correlation between "structure and organization" and "typographical appearance" ($r=0.858$, p-value<0.05) and "language" and "typographical appearance" ($r=0.868$, p-value<0.05).

GEL teachers show very high coefficients of positive correlation between "content-structure and organization" ($r=0.839$, p-value<0.05), "structure and organization-teaching and pedagogical appropriateness" ($r=0.825$, p-value<0.05), "language-typographical appearance" ($r=0.831$, p-value<0.05). The teachers of EPAL correlate more strongly the dyads "didactic and pedagogical suitability-language" ($r=0.895$, p-value<0.05) and "structure and organization- typographical appearance" ($r=0.910$, p-value<0.05). Substitute teachers considered a very significant positive relationship between "structure and organization" and "teaching and pedagogical suitability" ($r=0.998$, p-value<0.05), while permanent ones considered a very significant positive relationship between "content-structure and organization" ($r=0.804$, p-value<0.05), "structure and organization-didactic and pedagogical suitability" ($r=0.803$, p-value<0. 05) and "language-typographical appearance" ($r=0.830$, p-value<0.05). Finally, those with 0-10 years of experience record a very high positive correlation of "structure and organization-didactic and pedagogical suitability" ($r=0.998$, p-value<0.05) and those with 11-20 years record a correlation of "structure and organization-content" ($r=0.802$, p-value<0.05).

In order to answer the research question “does the gender and the school type, of economics teachers in the Prefecture of Rethymno, influence the evaluation grade of the textbook "Principles of Economic Theory"?, we used the parametric test “t-test for independent samples”. It can be used in this analysis because our sample follows the normal distribution and on the one hand we have dependent-quantitative variables and on the other one independent-qualitative variable per case that divides the sample into two groups (Roussos & Tsaousis, 2011). In relation to normality, we found that the sample follows the normal distribution as the Shapiro-Wilk test showed for all categories of independent variables that p-value>0.05.

After defining as null hypothesis that there is no statistically significant difference in the degree of textbook evaluation between males and females and between GEL and EPAL, we proceeded to the descriptive data analysis (mean, standard deviation, standard error of estimate) for the dichotomous variables of interest. We then performed a variance test using “Levene's test for equality of variances” (Chalcos, 2020). For the two dichotomous variables we observed that p-value > 0.05 for all 5 evaluation factors. So, we could not reject the null hypothesis of equality of variances. It seems that there are no statistically significant differences in the evaluation level of the textbook "Principles of Economic Theory" between males and females and between GEL and EPAL, as the t-test for equality of means (two-sided test) showed that everywhere p-value>0.05. However, this is true at the level of extrapolating our findings to a larger future population, as already stated. If we limit ourselves to our census data, through descriptive statistics, men rated "content", "structure and organization", "didactic and pedagogical suitability" and "typographical appearance" more positively, while women rated "language" (based on the “mean”). The type of teaching school gives more balanced results as there is only a large variation in "teaching and pedagogical suitability", where it is evaluated more positively by teachers in GEL.

In relation to the research question "is there a difference between economics teachers of the Prefecture of Rethymno of different ages, degrees, area of work, employment relationship and years of service in terms of the evaluation grade of the textbook "Principles of Economic Theory"?, we used the parametric one way anova test (one way analysis of variance) (Chalkos, 2020). This analysis is initiated when the sample follows the normal distribution, the variances of the quantitative variable in each category of the qualitative variable are equal and we have dependent-quantitative variables and one independent-qualitative variable per case that divides the sample into more than two groups independent of each other (Roussos & Tsaousis, 2011). In relation to normality, we found that the sample follows the normal distribution as the Shapiro-Wilk test showed for all categories of independent variables that p-value>0.05.

After defining as null hypothesis that there is no statistically significant difference in the degree of textbook evaluation among the groups of categorical variables, we proceeded to test for variances through Levene's test for equality of variances (Chalcos, 2020). For all categorical variables we observed that p-value>0.05 for all five evaluation factors. So, we could not reject the null hypothesis of equality of variances. We then tested the independence between the groups of categorical variables and found that only for the evaluation factor of "content" of "structure and organization" and "pedagogical and teaching suitability" there was a statistically significant difference between the groups of the categorical variable "work area" (p-value<0.05). To examine between which levels of this independent variable there were statistically significant differences the LSD multiple comparison test was applied (Chalcos, 2020). The results showed that for "content" and "structure and organization" statistically significant differences (p-value<0.05) were observed between "rural-urban" and "semi-urban-urban" areas, while for "didactic and pedagogical suitability" only between "rural-urban" areas.

Specifically, in relation to "content", teachers from rural areas of Rethymno have a higher evaluation score (mean = 46.6 ± 3.05) compared to teachers from urban areas (mean = 39.1 ± 4.17) and those from semi-urban areas (mean = 46.3 ± 4.04) had a higher evaluation score compared to those from urban areas. In relation to "structure and organization", the teachers of rural areas of Rethymno prefecture had a higher evaluation score (mean = 48 ± 5.29) compared to the teachers of urban areas (mean = 36 ± 5.33) and those of semi-urban areas (mean = 44.3 ± 5.68) had a higher evaluation score compared to those of urban areas. Finally, for "didactic and pedagogical suitability", the teachers of rural areas of Rethymno prefecture had a higher evaluation score (mean = 58.66 ± 13.79) compared to the teachers of urban areas (mean = 44.3 ± 6.48). In all other cases, we could not reject the null hypothesis of independence.

6. Conclusions and discussion

The main purpose of this paper was to evaluate the quality of the textbook "Principles of Economic Theory". We tried to make clear the necessity and correctness of its replacement by the Greek Ministry of Education and to introduce an evaluation method for both this and the new proposed textbook.

Using the prefecture of Rethymno as a case study, we cross-referenced the views of third grade students and the economics teachers of the public sector. The evaluation criteria used were "didactic and pedagogical suitability", "typographical appearance", "structure and organization", "content" and "language". Structured questionnaires were distributed to the economics teachers of Rethymno prefecture and semi-structured interviews were conducted with the students of the same area. The descriptive analysis showed in general that teachers and students agree in terms of evaluation on the quality of the textbook. Both consider "pedagogical and didactic suitability" and "typographical appearance" as major problems, while a slight difference is observed in the ranking order of "structure and organization" and "content". The 'language' of the text is considered satisfactory by both categories of respondents.

Because the statistical analysis applied to census data involves descriptive statistics and perhaps some correlation analysis, we were faced with the dilemma of whether to use the p-value to draw conclusions. We ended up considering the census of sixteen economics teachers as a sample data of a larger hypothetical population, which could refer to the corresponding teachers of future periods. This allowed us to apply inferential statistical tests to our data.

Pearson's correlation coefficient r revealed that all five evaluation variables show at least a low correlation between them. Most of them were statistically significant. No negative correlations were detected at all. The results vary considering separately the variables "gender", "age", "level of education", "area of work", "work relationship", "teaching school" and "years of experience" of the economics teachers.

The parametric test "t-test for independent samples" showed that there are no statistically significant differences in the degree of evaluation of the textbook "Principles of Economic Theory" between males and females and between GEL and EPAL. However, this is true at the level of extrapolation of our findings to a larger prospective population. The census data, through descriptive statistics, showed that men rated "content", "structure and organization", "didactic and pedagogical appropriateness" and "typographical appearance" more positively, while women rated "language". School type gives more balanced results as there is only a large variation in "didactic and pedagogical suitability", where it is evaluated more positively by teachers in GEL.

The parametric one way anova test clarified that for "content", "structure and organisation" and "pedagogical and didactic suitability" there is a statistically significant difference between the groups of the categorical variable "working area". The results of the LSD multiple comparison test showed that for "content" and "structure and organization" statistically significant differences are observed between the "rural-urban" and "semi-urban-urban" areas, while for "didactic and pedagogical suitability" only between the "rural-urban" areas.

The previous analysis clearly gives some indications of students' and teachers' attitudes towards this textbook. Unfortunately, it is limited to the prefecture of Rethymno and its research results cannot be generalized to the rest prefectures of Greece. However, it can form the basis for conducting similar research, following the same methodological tools. In addition, the quality of the research could be improved in the context of testing the validity of the conceptual construction of the structured likert-scale questions of students and teachers, which would require a larger number of respondents. It should also be mentioned that the sample of students was too small for the analysis of the structured questions (4% of the total population) and the sampling was non-probability. In the context of inferential statistics, the sample should have been random and larger to properly test the statistical significance of the responses.

In summary, it is evident that students and teachers in the prefecture of Rethymno are concerned about the quality and adequacy of the textbook "Principles of Economic Theory" in secondary education. A textbook that was introduced in the examination process of the panhellenic examinations in the school year 1999-2000, certainly needs updating and replacement. We therefore conclude that the Ministry of Education's announcement of a change in the curriculum and the writing of a new updated textbook for the newly created course "Principles of Economic Science" is correct.

References

Anastasiadou, D. (2012). Statistical methodology in social sciences. Athens: Kritiki.

Arguropoulou, E. (2018). Management in elementary education. Kindergarden, Primary school. Athens: Kritiki.

Babbie, E. (2018). An introduction to social research (2η εκδ.). Athens, Kritiki.

Banaszak, A. (1987). The nature of economic literacy. *Social science education*, (41).

Bonidis, K. (2005). Process and criteria for evaluating textbooks. In: Textbook- Educational material at school: Problems, possibilities, perspectives. Thessaloniki: Ziti.

Brasfield, Harisson, McCoy. (1993). The impact of high school economics on the college principles of economics course. *Journal of economic education*, 24(2), 99-112.

Brinia, B. (2007). The introduction of project method in economics teaching. Athens: Gutenberg.

Brinia, B., Hrisafidis, K. (2010). The application of the project method in the economic sciences: an empirical approach. *Educational sciences*, (1), 112-119.

Brinia, V., Vikas, E. (2011). The use of Greek literature through action-research in teaching "principles of economic theory" in secondary education level in Greece: A case study. SSRN.

Brinia, V., Kalogri, P., Stavrakouli, M. (2016). A new teaching method for teaching economics in secondary education. *Journal of research & method in education*, 6(2), σσ. 86-93.

Brinia, V., Sokou, M., Stavrakouli, K. (2015). Teaching economics in secondary education through modern music: an innovative proposal. *International journal of academic research in progressive education and development*, 4(4), σσ. 31-43.

Buckles, S. (1991). Guidelines for economic content in school programs and visions for the future. Στο Effective economic education in the schools. The joint council on economic education and the national education association.

Chalkos, G. (2020). Statistics. Theory and applications Athens: Disigma.

Chiappetta E. L., Fillman D. A., Sethna G. H. (1991). A Method to Quantify Major Themes of Scientific Literacy in Science Textbooks. *Journal of Research in Science Teaching*, 28 (8), 713-725.

Cohn, C., Cohn, S., Balch, D., Bradley, J. (2001). Do graphs promote learning in principle of economics? *Journal of economic education*, 32(4), 299-310.

Colander, D. (2017). Telling better stories in secondary macro. *American economic review*, 90(2), σσ. 76-80.

Dimitriadis, E. (2016). Business statistics and application to SPSS και LISREL (2nd. Ed.). Athens: Kritiki.

Durden, G., Ellis, L. (1995). The effects of attendance on student learning in principles of economics. *American economic review*, 85(2), 343-346.

Evans, D. (1996). Straightforward statistics for the behavioral sciences. Pacific Grove: Brooks-Cole publishing.

Finegan, A., & Siegfried, J. (1998). Do introductory economics students learn more if their instructor has a Ph.D;. *American economist*, 42(2), 34-46.

Gnardellis, C. (2013). Data analysis by IBM SPSS Statistics 21. Athens: Papazisis.

Gnardellis, C. (2019). Applied statistics (2nd. Ed.). Athens: Papazisis.

Hansen, L. (2013). Challenges in identifying and measuring systemic risk. University of Chicago (NBE).

Hansen, W. (2001). Expected proficiencies for undergraduate economics majors. Journal of economic education, 32(3), 231-242.

Johnsen, B. E. (1993). Textbooks in the kaleidoscope - A critical survey of literature and research on educational texts. Oslo: Scandinavian University Press.

Kallas, G. (2015). Theory, methodology and research methods in the social sciences. Athens: Kritiki.

Katsarou, E., Dedouli, M. (2008). Evaluation of educational material. In the Ministry of Education, Training and Evaluation in Education. Athens.

Kapsalis, A., Charalabous, D. (2008). Textbooks, Institutional Evolution and Contemporary Problems. Athens Metaihmio.

Kehaidou, D. (2011). Teachers in the teaching of economics in secondary education: a Christian pedagogical theoretical and empirical approach. PhD thesis. Thessaloniki: Aristoteleio University.

Konstantinou, C. (2002). The assessment of student performance according to the Steering Committee for Model and Experimental Schools. *Review of educational issues*. (7), 37-51.

Loabuchi, C. (2017). Assessment of teaching strategies and performance of students in economics: a case study of selected secondary schools in Enugu State. *Journal of educational policy and entrepreneurial research*, 4(6), 62-72.

Magoula, M. (2009). An introduction to economics teaching. Athens: Gutenberg.

Magoula, M. (2019). Teaching economics. Microteaching. Athens: Gutenberg.

Makridou-Bousiou, D. (1991). Financial literacy in secondary education: an assessment among senior students of public high schools in Macedonia. Doctoral thesis. Thessaloniki: University of Macedonia.

Markos, A. (2012). Guide to analyzing the reliability and validity of psychometric scales with SPSS. University notes in SPSS. Democritus University of Thrace.

Papaioannou, A., Zourbanos, N., Minos, G. (2016). Applications of statistics in sport and health sciences using SPSS. Thessaloniki Disigma.

Richaudeau, F. (1979). Conception et production des manuels scolaires. Guide pratique. Paris: Unesco.

Roussos, P., Tsaousis, G. (2011). Statistics in the behavioural sciences using SPSS. Athens: Topos.

Salemi, M., & Siegfried, J. (1999). The state of economic education. *American economic review*, 89(2), 355-361.

Samaras, N. (2003). Teaching economics in secondary education: economics and imagination. Doctoral thesis. Thessaloniki: University of Macedonia.

Saunders, M., Lewis, P., & Thornhill, A. (2019). Research methods in business and economy (2nd ed.). Athens: Disigma.

Schindler, P. S. (2019). Research methods in business. Athens: Kritiki.

Sitzimis, I. (2011). Principles of economic theory. Teaching methodology. Athens: Bookstars.

Tirovouzis, P. (2006). The use of new technologies in the teaching of economics courses: the impact of the open source software development model. Doctoral thesis. Thessaloniki: University of Macedonia.

Trilianos, A. (1999). Framework for the Evaluation of Teaching Manuals. Athens: Pedagogical Institute.

Tsolakis, C. (2005). The character and content of the textbook. In: Textbook - Educational material at school: reflections, possibilities, perspectives, (Proceedings). Thessaloniki: Ziti.

Xohelis, P. (2005). Criteria for the validity, reliability and pedagogical appropriateness of textbooks. In: Textbook Educational material at school: Problems, possibilities, perspectives. Thessaloniki: Ziti.

Walstad, W. (2001). Improving assessment in university economics. *Journal of economic education*, 32(3), 281-294.

Weiss, D. (1988). Die politik der Lehrbucher in den USA. *Bildung und Erziehung*, 41(3), 329-335.

Whitehead, D., & Makridou-Bousiou, D. (2006). Economic education and teaching of economics Athens: Gutenberg.

Zafeiropoulos, K. (2015). How to do a scientific paper (2nd. Ed.). Athens: Kritiki.

Internet sources

https://www.alfavita.gr/ekpaideysi/362959_sholeia-ta-pano-kato-me-ta-nea-programmata-spoydon-kai-pollaplo-biblio (date of last access January 25, 2022)

https://www.alfavita.gr/panellinies/352231_panellinies-2021-astohies-kai-problimatismoi-gia-tin-exetasi-aoth (date of last access Fabruary 1, 2022)

https://www.protothema.gr/greece/article/1180615/upourgeio-paideias-megales-allages-stin-uli-kai-ta-vivlia-olon-ton-vathmidon/ (date of last access January 25, 2022)

https://www.statistics.gr/el/statistics/-/publication/SED23/2018 (date of last access January 20, 2021)

https://www.minedu.gov.gr/publications/docs2018 (date of last access October 18, 2021).

https://www.esos.gr/sites/default/files/articles-legacy/programma_spoydon_toy_mathimatos_ton_ar-_hon_oikonomikis_epistimis_tis_g_taxis_genikoy_lykeioy.pdf (date of last access August 15, 2022)

https://core.ac.uk/download/pdf/49280707.pdf (OEPEK-Teacher Training Organisation) (date of last access August 25, 2022), A., Astin, H., & Cress, C. (2000). Community service in higher education: A look at the nation’s faculty. Review of Higher Education, 23(4), 373-398.