

Determination and Elimination of Misconceptions of Geomatics Engineering Students about the Relationship between Foundation and Its Real Estate: A Case Study for Conceptual Understanding Test

Yakup Emre ÇORUHLU, Fatih TERZİ, Sibel ER NAS, Bayram UZUN, Okan YILDIZ, Fatih ŞAHİN, Turkey

Key words: fused foundation, foundational real estate, misconception, immovable cultural property, material design

SUMMARY

Türkiye has a great potential in terms of foundations and foundational real estates from the past. As it is known, the land management implementations of fused foundations' real estates are carried out by General Directorate of Foundations (GDF) through the geomatics engineers in there. There is no course in the bachelor curriculum of the Department of Geomatics Engineering in Türkiye that describes in detail the foundational real estate and reinforces it with various land implementation practices. This situation may cause the Geomatics Engineers, working in the fields related to the foundational real estates after graduation, to encounter problems, make wrong applications and implementation and take wrong decisions. The aim of the project is determining misconceptions of the senior student in bachelor programme in geomatics (sample group) on the relationship between foundation and land ownership and to develop and implement materials for the elimination of these misconceptions and evaluate the effectiveness of the developed materials. To achieve this aim, simple experimental method was used. The project consists of preliminary, pilot and main applications. Open-ended questionnaire, semi-structured interview form and conceptual understanding tests were used as data collection tools. In this study, data acquired from the "conceptual understanding test" are presented. As a result of the analysis of the preliminary and pilot studies, guidance materials for information deficiencies and misconceptions were developed in the application of Article 30 of the Law on Foundations, which includes the basic concepts related to the terminology of the foundation. In addition, validity and reliability tests of the guide materials and data collection tools prepared during the pre-application process were also performed. In the analysis of quantitative data, non-parametric analysis techniques, "Wilcoxon signed rank test" were used. Within the scope of the application of Article 30 of the Law on Foundations, it has been found that conceptual change texts, case studies and drama activities and enriched guide materials have a significant effect on the students' conceptual changes ($z = -5,519$ $p < .05$). In the other words the lack of knowledge and conceptual misconceptions of the sample group were eliminated according to the statistical analysis of the pre- and post-test data. In the light of the data obtained from the study, developing materials in other areas related to land management and to investigate its effectiveness is recommended.

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1. INTRODUCTION

The word waqf/foundation means “stopping, detaining, standing, and resting” (Muhammed, 1933; Koyunoğlu H. 2002). Foundation immovables are defined as immovable properties owned by foundations. These immovables are used as revenue generating means for the conduct of the services of foundations. For this reason, effective management of foundations can be achieved by effective management of foundation real estate (Çoruhlu, 2013). This concept, which in many societies is also available, and the Ottoman Empire in Turkey, which is a continuation (Khatami, 1996; Berki, 1934; Ertuğ 2007, Veles, 1981, Mardin, 1954; Koyunoglu, 2002).

Foundation is a legal entity which is defined as a group of goods. Foundations can acquire immovable property. Due to their immovable properties, foundations are included in land management practices. One of the effective occupations in land management is geomatics engineers. When the available literature is examined, it is seen that there are limited studies conducted on foundation and foundational real estates focused on geomatics engineers and students from geomatics engineering departments (Çoruhlu, 2013). A limited number studies can be seen about the foundation, the immovable property and their relationship with the concept of ownership (Çoruhlu and Demir, 2009a, 2009, Çoruhlu and Demir, 2013a, 2013b, 2013c; Çoruhlu, 2013, Çoruhlu and Demir 2014a, Çoruhlu and Demir 2014b) Coruhlu and Demir, 2014c; Coruhlu and Demir, 2014d; Coruhlu and Demir, 2016; Coruhlu et al., 2016). It is known that even the geomatics engineers working in the GDF in Turkey have deficiencies in the issues of foundation and property (Çoruhlu and Demir, 2015).

This work will play an important role in the realization of land management practices including foundation immovables, in the elimination of the inadequacy of the practitioners in these issues, in developing the sensitivity of the foundations in the practitioners, and in raising awareness in the selected students as a sample group. Until today; there are many studies on the basis of foundations and property. It is extremely important to transfer the knowledge and experience we gained in foundations and property issues to senior undergraduate students in geomatics engineers. This transfer; In the field of education, conceptual change text is provided with case studies and drama activities. Studies in which these methods and techniques are utilized in the undergraduate curriculum of geomatics engineering are quite limited. This is the starting point of the study. In this study, in order to eliminate the misconceptions of students in teaching the subject of Article 30 of the Law on Foundations and to make the teaching enjoyable; conceptual change text, case studies and drama activities were utilized.

It is aimed with this study on undergraduate geomatics engineering senior students that to first develop and to implement a guide materials and then to evaluate the impact of the materials in the name of detection and elimination of misconceptions related to foundations and theirs' properties”

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2. METHOD

In this study, simple experimental research method was used. A simple experimental research method involves a group. In this method, control group is not included (Çepni, 2010). The path followed in the scope of the study is presented in Figure 1 **Fejl! Henvisningskilde ikke fundet..**

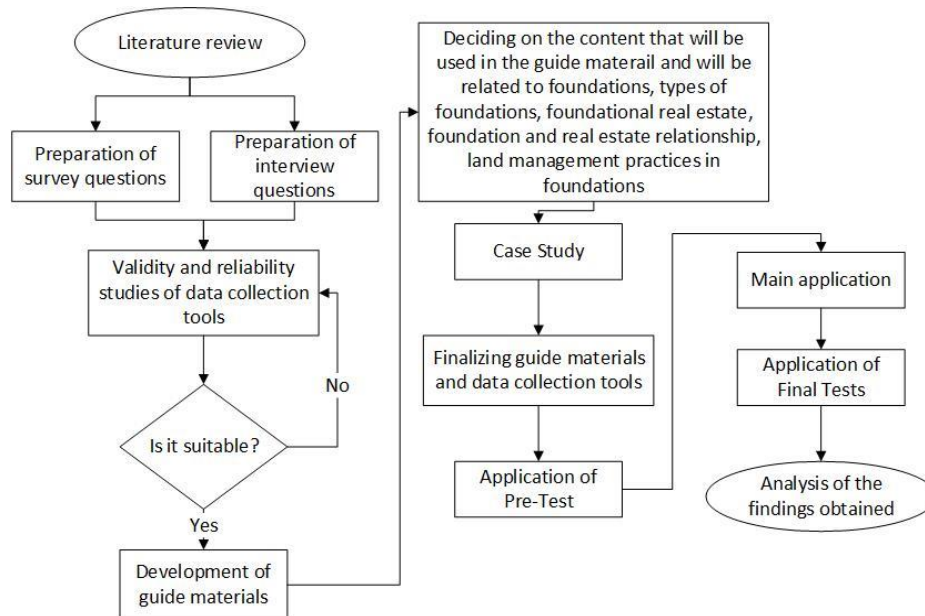


Figure 1. Application stages of the study

1.1 Sample Group

The sample group of the study consists of 40 students who are senior undergraduate students of geomatics engineering. Simple random sample selection was used in sample selection. In a simple random sample, the probability and chance of each sample constituting the sample group (universe) is equal to the group-sample. In other words, the weight of each sample candidate is the same (Arıkan, 2004).

1.1.1 Developing the Guide Materials

Within the scope of the study, as a result of survey and interview data analysis before application, students of geomatics engineering; the following information deficiencies and misconceptions were found.

- The concept and definition of the foundation,
- Types of foundations,
- Foundations before the Republic,
- Foundations after the Republic,
- Management and representation of foundations,
- Ownership in foundations,
- The relationship between the foundation and property,
- Foundation and land registry connection,
- Implementation of Article 30 of the Law on Foundations, which is a new real estate acquisition

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Therefore, within the scope of the study, it was decided to develop the following materials on the application of Article 30 of the Law on Foundations.

- Conceptual change texts,
- Case studies,
- Drama materials,

Conceptual change texts enable students to be aware of their misconceptions. Explains the reasons and examples of why these ideas are wrong. Conceptual change texts are written documents presenting scientifically accepted concepts or ideas (Chambers and Andre, 1997). In other words, these are the texts that enable students to turn their non-scientific thoughts into scientific thoughts (Demirci, 2011). Concept change texts were prepared in order to eliminate the information deficiencies and misconceptions detected in the students.

Case study is a method that brings students face to face with real life problems. This method helps fill the gap between theory and practice. Students may not be able to bridge the gap between abstract subjects and real life. The case study method can be used to establish this bridge. This method can activate students (Woolfolk, 1998). Two case studies were prepared in this study. The first case study focuses on the current ownership status of the immovable property and the subject / concepts of the immovable property indicating the cultural property in the land registry. The second case study focuses on the relationship between the immovable and the foundations and the reporting of this relationship with the foundation archives.

The drama method can be defined as animating a subject by using techniques such as role playing and improvisation, starting with the experiences of a group and the members of the group (Adıgüzel, 2007). The important thing in the drama method is to stimulate the creativity of the student and to present the ways to reach information. Drama is an effective way of learning in terms of concretizing abstract concepts, addressing many senses and making events and situations understandable (Er Nas, 2013). In the drama event, it is aimed that all immovable properties belonging to different legal entities will be handled comparatively. Within the framework of this objective, students are expected to make inferences by discussing which types of immovables can be subject to Article 30. In this process, it is important for students to use their creativity.

Within the scope of Article 30 of the Law on Foundations, material enriched with conceptual change text, case studies and drama activities were utilized in the process.

1.2 Data Collection Tools

As a data collection tool, conceptual understanding test consisting of open-ended questions was used. Students' conceptual understanding was examined thanks to the data collection tool used. Questions have been prepared considering the work flow in the Law of Foundations.

The pilot application of the research is presented in **Fejl! Henvisningskilde ikke fundet.**. The study was conducted with 20 students. Materials and data collection tools were finalized after the pilot implementation.

Data collection tools and materials were arranged based on the data obtained from the pilot application. Apart from the pilot application, the materials were examined by two academicians and two experts working at the GDF. Thus, expert opinions about the materials were obtained. The pilot implementation of the study was completed in 3 months. The final arrangements of the materials and data collection tools prepared after the pilot implementation were completed in 1 month.

The main application of the study was carried out with 40 undergraduate senior students. **Fejl! Henvisningskilde ikke fundet.** Study on the actual implementation process. Yakup Coruhlu, Fatih Terzi, Sibel Er Nas, Bayram Uzun, Okan Yıldız and Fatih Sahin (Turkey)

1.3 Data Analyze

The categorization method (Marek 1986) was used in the analysis of conceptual comprehension test consisting of open-ended questions.

- Full Understanding (3 points),
- Partial Understanding (2 points),
- Partial Understanding with Specific Misconception (1 point),
- Specific Misconception (0 points) and Misunderstanding (0 points)

The data obtained from the conceptual comprehension test were analyzed using non-parametric tests. The data were presented to the reader in the form of line graphs to show the individual development of each student. In addition, the sample answers are presented to the reader as an example for the categories. Students were coded within the framework of research ethics. In coding, the numbers 1 to 40 were assigned to the students as codes.

3. FINDINGS

9 questions were asked to the students in the test. 4 of the questions asked in this study (1, 3, 6, 9) are given in detail.

As the first question to the students in the test, “Which institution do you think is responsible for foundations in our country? Why? Please explain.”

The possible correct answer expected from the students for the related question General Directorate of Foundations (GDF) is responsible for all kinds of transactions of foundations. GDF controls all the works and operations of both foundations established before and after the Republic. In other words, all kinds of works and transactions of all foundations in our country are within the scope of GDF's duty, authority and responsibility.

An example of the answers given by the students to the related question in the Pre-Test (SP) is given in Table 1.

Table 1. Sample student answers for categories for CUT's 1st question in the Pre-Test

Categories:C	Sample explanations	SC
FU	Because it is an official organization that brings all foundations under one.	1

Again in the Pre-Test, the students were classified according to their answers as in Table 2.

Table 2. Pre-test CUT's 1st question according to the classification of students

Categories: C	Student Codes
Full Understanding (FU)	1, 2,..., 39, 40 (All students)

The most appropriate examples of the answers given by the students in the final test are presented in Table 3.

Table 3. Sample student answers for categories for CUT's 1st question in the final test

C	Sample explanations	SC
FU	The General Directorate of Foundations (GDF) is responsible. Because it is authorized by State.	40

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After application of materials, the data on the classification of the students according to their answers are presented in Table 4.

Table 4. In the final test, students are categorized according to CUT's 1st question

Categories	Student Codes
FU	1, 2, ..., 39, 40 (All students)

The answers to the relevant test question were evaluated before and after the materials and the improvement of the students was examined. This review is shown in

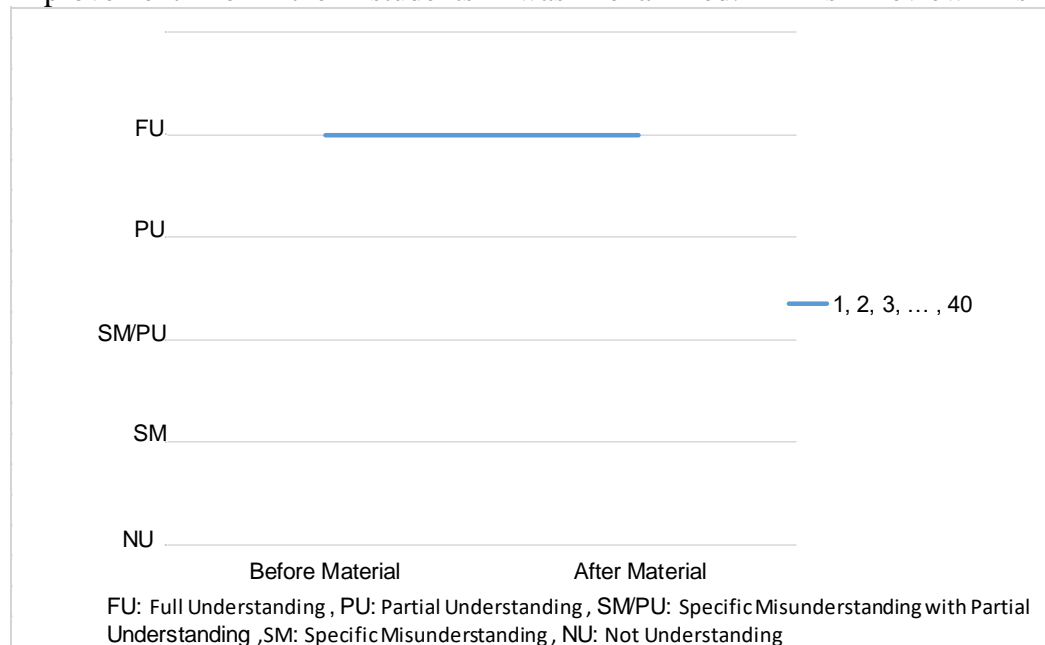
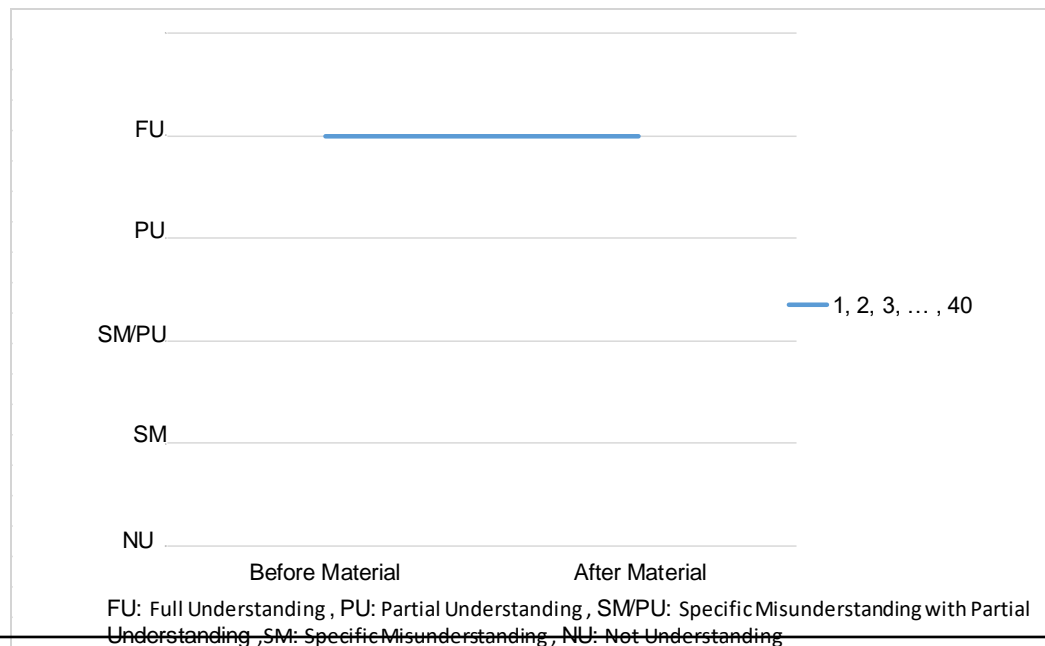


Figure 2.



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The evaluations are presented below. In the Conceptual Understanding Test, all students have full understanding before and after the material.

The third question is “What is the foundation immovable? Please explain.”

The possible correct answer expected from the students for the related question is that “Foundation immovable, immovable property belonging to any foundation is called foundation immovable. The owner of the real estate is the related foundation.”

Examples of the answers given by students to the question in the pre-test are presented in **Fejl! Henvisningskilde ikke fundet**. Table 5.

Table 5. Example student answers for the CUT's of question 3 in Pre -Test

C	Sample explanations	SC
FU	Foundational real estate defines as a real estate owned by a foundation	7
PU	Foundational real estate defines as a real estate is related to a foundation.	25
NU	I do not know.	17

Again in the pre-test, the students were classified according to their answers as in Table 6.

Table 6. Classification of students according to CUT's 3rd question in pre-test

Categories	Student Codes
Full Understanding	2, 7, 10, 12, 13, 14, 21, 22, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 38, 39, 40
Partial Understanding	25
Not Understanding	1, 3, 4, 5, 6, 8, 9, 11, 15, 16, 17, 18, 19, 20, 23, 24, 37,

Examples of the answers given by the students to the question in the final test are presented in Table 7.

Table 7. Sample student answers for categories for question 3 of CUT in Last Test

C	Sample explanations	SC
FU	It is called foundational immovable property owned by foundations. Mosque, Turkish bath, etc. as	12
PU	a real estate, which is related to "foundation voucher" or "foundation certificate-charter", is dedicated to the public interest.	17
NU	It is a collection of goods with a certain purpose and continuity. It can be managed by private or legal persons.	9

The data regarding the classification of the students according to their answers in the last test are presented in Table 8.

Table 8. Classification of students according to CUT's 3rd question in Last Test

Categories	Student Codes
Full Understanding	2, 3, 4, 7, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40
Partial Understanding	17
Not Understanding	1, 5, 6, 8, 9, 24

The answers to the relevant test question were evaluated before and after the materials and the students' improvement was examined. This review is shown in

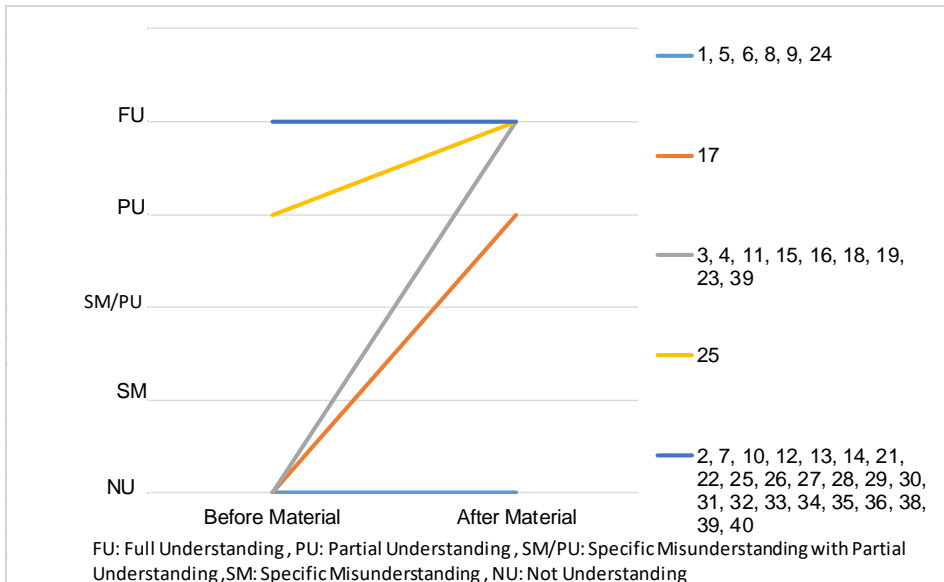


Figure 3.

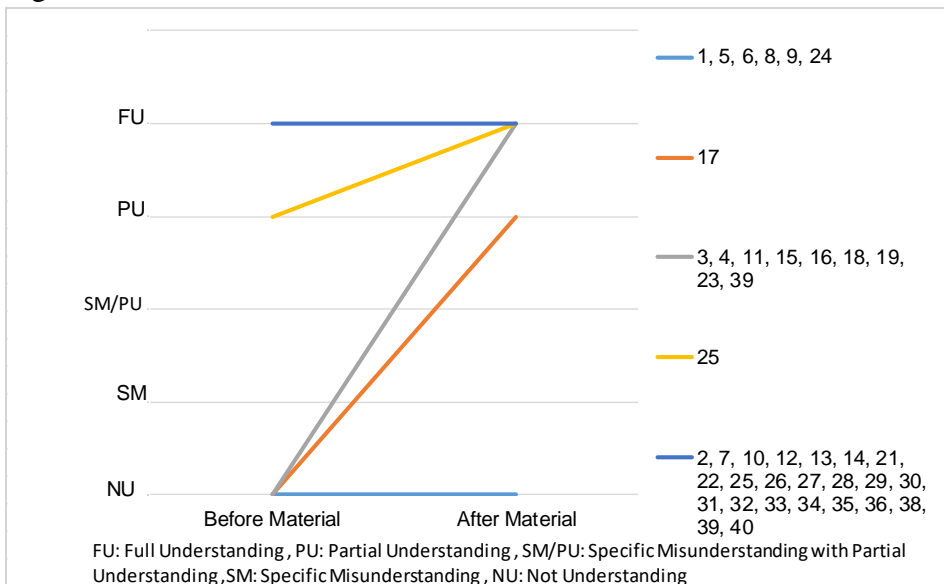


Figure 3. Distribution of student answers to the 3rd question of the test

The assessments for question 3 of the conceptual understanding test are presented below. Together with the materials, 15% of the students are in the non-understanding category before and after the material. The student with the code 17 was in the non-understanding category before the material, and then moved to the partial understanding category after the material. While 22.5% of the students were in the non-comprehension category before the application of the materials, they were included in the full comprehension category after the materials. The 25 coded student was in the partial comprehension category before the material and after the material they were transferred to the full comprehension category. 57.5% of the students are in the full understanding category before and after the material.

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Examples of CUT's answers to the related question in the Pre-Test are presented in Table 9.

Table 9. Sample student answers for categories for question 6 of CUT in pre-test

C	Sample explanations	SC
FU	As long as the foundational purpose is suitable for law, it can be established	19
PU	Public interest must be paid attention	2
SM	It is possible	5
NU	I have no idea	18

In the pre-test, the students were classified according to their answers as in Table 10.

Table 10. Classification of students according to CUT's sixth question in Pre-Test

Categories	Student Codes
Full Understanding	19, 37
Partial Understanding	2, 13, 14, 23, 29, 34, 39, 40
Specific Misunderstanding	5, 6, 7, 8, 12, 15, 16, 22
Not Understanding	1, 3, 4, 9, 10, 11, 17, 18, 20, 21, 24, 25, 26, 27, 28, 30, 31, 32, 33, 35, 36, 38

Examples of the answers given by the students in the final test are presented in Table 11.

Table 11. Sample student answers for categories for question 6 of CUT in Last Test

C	Sample explanations	SC
FU	A foundation cannot be established for every purpose. First of all, a foundation can be established for a purpose which has to be clear, definite and permanent. For example; "theft training foundation" can not be established because the purpose of this foundation is not lawful.	10
PU	No, it can't, because the purpose of the foundation should be for the community benefit.	1
SM	It is possible. A foundation can be established for every purpose such as mosque aid, education of people and aid to poor people.	25
NU	It is not possible to establish a foundation for every purpose and it must be registered after the approval of the conditions for foundation. (foundation voucher)	31

The data regarding the classification of the students according to their answers in the final test is presented in Table 12.

Table 12. Classification of students according to CUT 6th question in Last Test

Categories	Student Codes
Full Understanding	2, 3, 4, 5, 6, 8, 9, 10, 12, 13, 14, 16, 18, 19, 20, 21, 22, 23, 24, 26, 28, 30, 32, 33, 34, 36, 37, 38, 39
Partial Understanding	1, 7, 11, 15, 17, 27, 29, 35, 40
Specific Misunderstanding	25
Not Understanding	31

The answers to the relevant test question were evaluated before and after the materials and the students' improvement was examined. This review is shown in

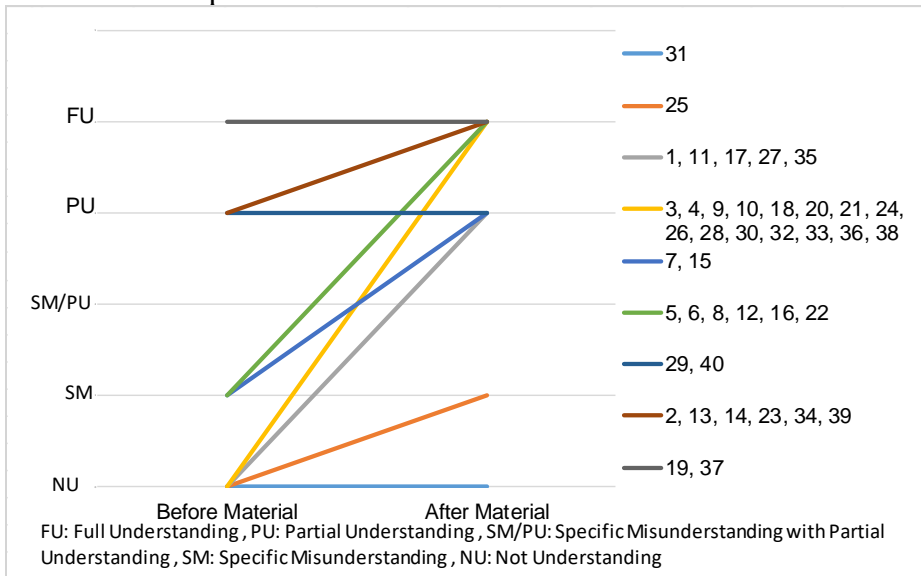


Figure 4.

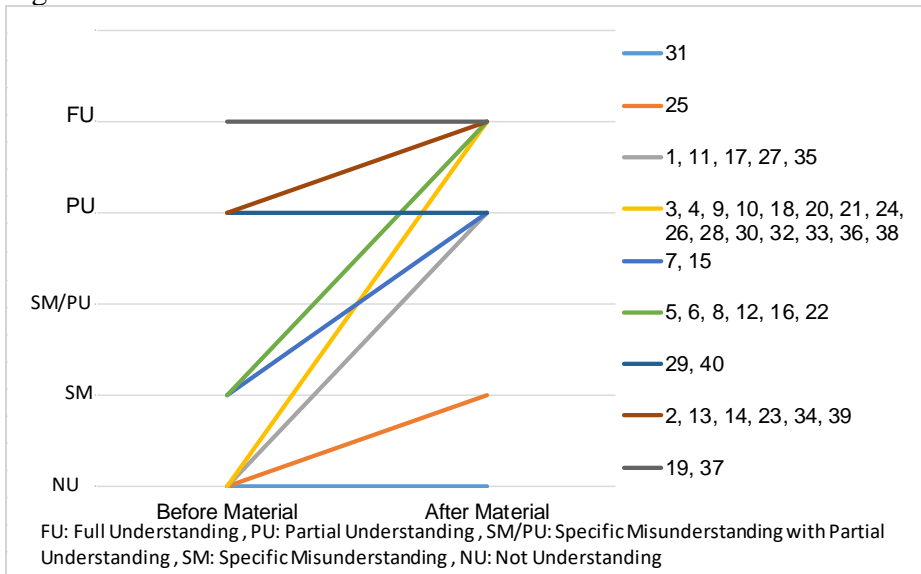


Figure 4. The distribution of student answers to the sixth question of the test into categories

The assessments for question 6 of the conceptual comprehension test are presented below. The 31 coded student is included in the category of non-comprehension before and after the materials. The 25 coded student is in the category of misunderstanding before the materials, and after the material is in the category of misunderstanding. While 12.5% of the students were in the non-comprehension category before the material, they were transferred to the partial comprehension category after the material. While 37.5% were in the non-comprehension category before the application of the materials, they were in the full comprehension category after the materials. While 5% of the students were in a certain misunderstanding category before the application of the materials, they were included in the partial understanding category after the materials. 15% of the students were in the misunderstanding category before the material and after the material in the full comprehension category. 5% of the students are in the partial

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understanding category before and after the material. While 15% of the students were in the partial comprehension category before the material, they were transferred to the full comprehension category after the material. 5% of the students are in the full understanding category before and after the material.

As the 9th question to the students in the tests “According to you, can a real estate, which is a cultural asset and registered in the name of a particular public legal entity, be registered in the name of the fused foundation? Please explain.”

The possible correct answer expected from the students for the related question is as follow. “Such a structured real estate has the potential to be registered on behalf of a fused foundation. However, the owner of the immovable must first be investigated. First of all, the owner of the real estate must belong to the Treasury, Special Provincial Administration, Village Legal Entity or Municipality. Then, it is necessary to prove that the real estate was built by the same foundation at the beginning. If these two conditions are provided together, the real estate can be registered, free of charge, on behalf of the same fused foundation. The whole process should be reported legally and technically by the geomatics engineers and foundation experts of GDF. Reports should be based entirely on official documents from Ottoman time or early republican period or later. These reports should be prepared in accordance with Article 30 of the Law of Foundations and Article 178 of the Regulation of Foundations. These studies are notified by GDF to the relevant Land Registry Office. Land Registry Office primarily examines documents and information. If the Land Registry Office considers that the requested transaction is in accordance with the legislation, real estate will be registered on behalf of the relevant fused foundation. Thus, the ownership of the immovable is transferred to the related foundation. Examples of the students' answers to the relevant question of CUT in the Pre-Test are presented in Table 13.

Table 13. Sample student answers for categories for question 9 of CUT in Pre-Test

C	Sample explanations	SC
SM	No. Immovable Cultural assets are registered on behalf of the Ministry of Culture and Tourism.	10
NU	I have no idea about this subject	31

Again in the Pre-Test, the students were classified according to their answers as in Table 14.

Table 14. Classification of students according to CUT 9th question in Pre-Test

Categories	Student Codes
Specific Misunderstanding	2, 6, 10, 18, 24, 28, 36, 38
Not Understanding	1, 3, 4, 5, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 25, 26, 27, 29, 30, 31, 32, 33, 34, 35, 37, 39, 40

Examples of the answers given by the students in the final test are presented in Table 15.

Table 15. Sample student answers for categories for question 9 of CUT in Last Test

C	Sample explanations	SC
FU	According to Article 30 of the Law on Foundations; if any of the municipality, village legal entity, provincial special administration or the treasury is the owner of the real estate, this real estate can be registered in the name of fused foundation. It must be examined whether the fused foundation is real fused foundation or not. Later Registration can be carried out on behalf of the foundation.	10
PU	If the owner of the property is one of the 4 public legal entities, it can be registered.	16

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SM/PU	First evidence is to be found and later handed to the fused foundation so that can be registered.	7
SM	This immovable cannot be registered on behalf of the fused foundation.	35
NU	I do not know.	21

The data regarding the classification of the students according to their answers in the Final Test are presented in Table 16.

Table 16. Classification of students according to CUT 9th question in Last Test

Categories	Student Codes
Full Understanding	1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 20, 22, 23, 24, 26, 27, 28, 29, 31, 32, 33, 36, 37, 38, 39, 40
Partial Understanding	16, 17, 25
Specific Misunderstanding with Partial Understanding	7
Specific Misunderstanding	35
Not Understanding	21, 30, 34

The answers to the relevant test question were evaluated before and after the materials, therefore students' question-based improvement was examined. This review is shown in

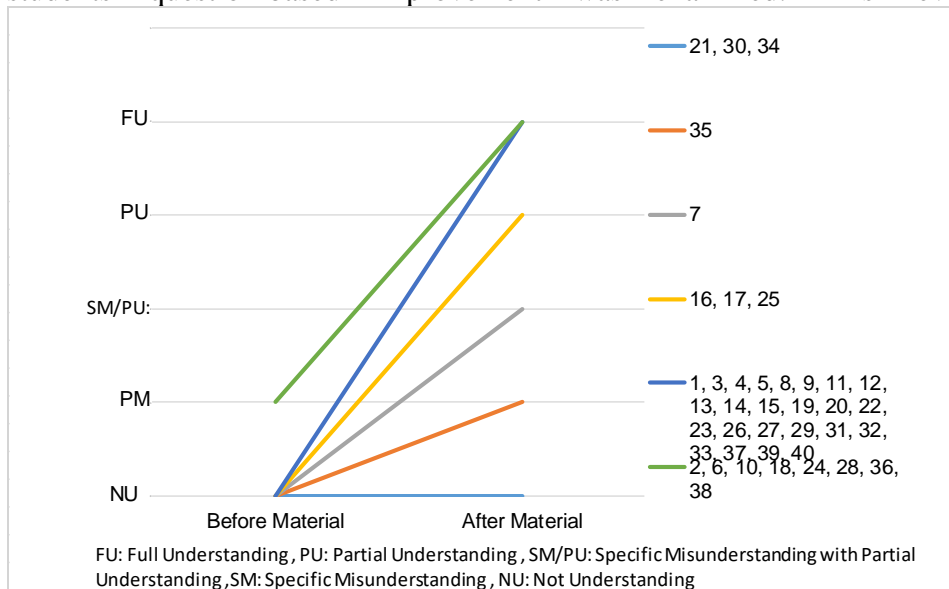


Figure 5.

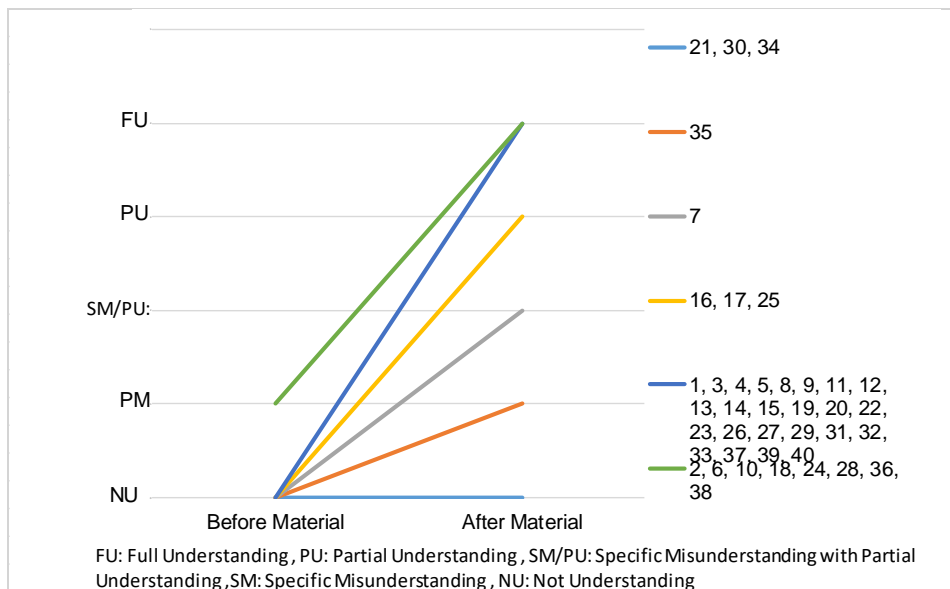


Figure 5. The distribution of student answers to the 9th question in the test

The assessments for question 9 of the conceptual understanding test are presented below. Together with the materials, 7.5% of the students are in the non-comprehension category before and after the materials. The 35 coded student was in the category of misunderstanding before the materials and after the materials in the certain misunderstanding category. While the students with the code 7 was in the non-comprehension category before the materials, the code 7 student was transferred to the partial comprehension category with certain misunderstanding after the materials. While 7.5% of the students were in the non-comprehension category before the material, they moved to the partial comprehension category after the material. While 60% were in the non-comprehension category before the materials, they were in the full comprehension category after the materials. While 20% of the students were in the misunderstanding category before the material, they were in the full comprehension category after the material.

Pre-test and post-test scores of the sample group were analyzed using Wilcoxon Signed Ranks Test. The results obtained from the analysis results are presented in tables.

The results of Wilcoxon Signed Ranks Test of the pre-test and post-test scores of the sample group are given in Table 17.

Table 17. Wilcoxon Signed Ranks Test results of pre-test and post-test scores of the sample group

Last test- Pre test	N	Average	Total	z	p
Negative sequence	0	0,00	0,00		
Positive rank	40	20,50	820,00	-5,519*	0,000**
Equal	0				

*Based on negative ranks, ** p<.05

The results of the analysis show that there is a significant difference between the pre-test and post-test scores of the students in the sample group (z = -5,519, p = 0,000). Considering the border position and elimination of misconceptions of Chromatic Engineering Student (95). © On the border Foundation and Its Real Estate: A Case Study for Conceptual Understanding Test (10381) Yakup Coruhlu, Fatih Terzi, Sibel Er Nas, Bayram Uzun, Okan Yıldız and Fatih Sahin (Turkey)

totals of difference points, this difference appears to be in favor of negative sequences which means in favor of post-test. In other words, it can be said that the conceptual change texts, case studies and drama activities applied to the sample group are highly effective in ensuring the conceptual changes of the students.

4. DISCUSSION AND CONCLUSIONS

Within the scope of the study, as a result of survey and interview data analysis before application, students of geomatics engineering as sample group have the following deficiencies and misconceptions such as the concept and definition of the foundation, types of foundations, foundations before the Republic, foundations after the Republic, management and representation of foundations, ownership in foundations, the relationship between the foundation and property, foundation and land registry connection, implementation of Article 30 of the Law on Foundations, which is a new real estate acquisition management (Çoruhlu vd., 2019c). It was decided to develop materials for the implementation of Article 30 of the Law on Foundations, which included students' lack of knowledge and misconceptions. The materials were prepared to include conceptual change text, case studies and drama activities. The students had the opportunity to change their misconceptions with scientific truths with conceptual change texts. In the last test, it can be said that conceptual change texts are effective in eliminating the students' misconceptions. As a matter of fact, there are some studies in the literature which reveal that conceptual change texts are effective in eliminating students' misconceptions (Diakidoy, Kendeou and Ioannides 2003; Özkan, Tekkaya and Geban 2004; Alkhalaf 2007; Akbaş, Koca and Cin 2008; Berber and Sarı 2009; Durmuş and Bayraktar 2010; Yellow Moon 2011; Şahin, Bülbül and Durukan 2013; Şenel Çoruhlu and Çepni 2016; Awake and Religious 2016; Şenel Çoruhlu, Kirman Bilgin and Er Nas 2016). The case study method is a teaching method that establishes the relationship between the concept learned and the situation in which it exists (Sönmez, 2001). With the case study, students can establish a relationship between theory and practice (Dori, Tal & Tsaushu, 2003). Thanks to the case studies in the study, students examined the application of Article 30 through a real application example. O'Connor and Hayden (2008) found that presenting daily life to students with case studies and animations increased their interest in the lesson. Studies that reveal that case studies contribute to student achievement, attitudes towards the course and their relationship with subjects in daily life are found in the literature (Jones 1997; Dori, Tal and Tsaushu 2003; Belt, Leisvik, Hyde and Overton 2005; Özkan and Azar 2005; Potter and Overton 2006; O'Connor and Hayden 2008; Dori and Sasson 2008; Yalçınkaya 2010; Box and Sözbilir 2011; Şenel Çoruhlu, Kirman Bilgin and Er Nas 2016). Dramatic activities used in the study contributed to the students to reinforce the events and to learn them in a fun way. It has been revealed by various researchers that the learning environment in which drama improves student achievement is fun (Arieli 2007; Çam, Özkan and Avinç 2009; Tuncel 2009; Aykaç and Adıgüzel 2011; Kahyaoğlu, Yavuzer and Aydede 2010).

It was determined that the materials developed for the application of Article 30 of the Law on Foundations had a significant effect on students' conceptual understanding ($z = 5,519$ $p < 0.05$). It has been concluded that conceptual change texts, case studies and drama activities contribute to the permanent and meaningful learning of the students. It was evaluated that the materials developed by using conceptual change texts, case studies and drama activities were highly effective in providing students with conceptual changes.

Geomatics Engineering of Students had not have sufficient knowledge about foundations
Moreover, the materials used before the project did not allow students to obtain sufficient
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information about foundations. Together with the materials developed within the scope of the study, the students are able to obtain sufficient information about the foundations.

The Conceptual Change Text has contributed to the full understanding of the relationship between students' law of persons and the legal entity of the foundation. The definition of the foundation and the types of foundations are explained with the conceptual change text. Before and after the Republic, the differences in the management and representation of foundations were understood by the students. In addition, the students have realized that foundations can be established only for specific and permanent purposes that are lawful. In the last part of the conceptual change text, they learned the concepts of foundation certificate-charter, fused foundation and immovable cultural assets. Thus, students have a better understanding of the application of Article 30 of the Law on Foundations. In addition, the students largely corrected their mistakes.

Similarly, thanks to the conversion of a real application to case study text, the students also understood the workflow related to the application of Article 30 for different immovables.

In the drama event, the students were asked to play the fictionalized scenario. The students realized that they should conduct separate research for different public legal entities and different properties within the drama activity. At the end of the examinations of the students, they followed certain process steps one by one for the immovables that have the potential to become foundation immovables. At the end of the drama activity, an immovable property-registered as cultural asset- built by the fused foundation at the beginning was discussed. With the scenario completed with the registration of this real estate on behalf of the fused foundation, the students reinforced the issue.

All the materials developed were effective in eliminating students' information deficiencies and misconceptions. As a result of the gains obtained within the scope of the study, it can be said that similar studies can be arranged for various land management applications in which student have some misconceptions.

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