Özgün Makale

Examination of the Text and Sentiment Analysis of the Opinions of the Students in the Social Service Departments regarding the Concept of Education*

Sosyal Hizmet Bölümlerinde Öğrenim Gören Öğrencilerin Eğitim Kavramına İlişkin Görüşlerinin Metin ve Duygu Analizi ile İncelenmesi

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Abstract

The main aim of this research is to examine the opinions and sentiments of university students in the department of social service regarding the concept of education. This research is based on a mixed research design where both qualitative and quantitative data are both used. In the first part of the study, students are asked to write an essay about what does the concept of education means to them. Then the data was analyzed in MATLAB and SPSS and different online text and sentiment analysis tools. The population of the study consists of the social services department in Iğdır University. The sample was selected from 16 third-grade students in the social services department of which 4 are male 12 of them are female students based on the convenient sampling method. The first finding shows that the sentimental tone of the whole responses is neutral but there is a slightly positive tone due to the higher slightly positive, positive, and very positive values. The second finding reveals that the range of female students regarding their sentiments is broader than the male ones. It seems that although students have a cognitive understanding regarding the importance of education they are less enthusiastic about it in the context of the affective domain.

Keywords: Text Analytics, sentiment analysis, affective domain, education

Öz

Bu araştırmanın amacı, sosyal hizmet bölümü üniversite öğrencilerinin eğitim kavramına ilişkin görüş ve duygularını incelemektir. Bu araştırma hem nitel hem de nicel verilerin kullanıldığı

bir karma araştırma tasarımına dayanmaktadır. Çalışmanın ilk bölümünde öğrencilerden eğitim kavramının onlar için ne anlama geldiğine dair bir kompozisyon yazmaları istenmiştir. Daha sonra veriler MATLAB ve SPSS ile farklı çevrimiçi metin ve duygu (sentiment) analizi araçlarında analiz edilmiştir. Araştırmanın evrenini Iğdır Üniversitesi sosyal hizmetler bölümü oluşturmaktadır. Örneklem, sosyal hizmetler bölümünde, 4'ü erkek 12'si kız öğrenci olmak üzere 16 üçüncü sınıf öğrencisinden uygun örnekleme yöntemine göre seçilmiştir. İlk bulgu, tüm yanıtların duygusal tonunun nötr olduğunu, ancak daha yüksek, biraz olumlu, olumlu ve çok olumlu değerlerin görece fazlalığı nedeniyle biraz olumlu bir ton olduğunu göstermektedir. İkinci bulgu, kız öğrencilerin duygu dağılımının erkeklere göre daha geniş olduğunu ortaya koymaktadır.Öğrencilerin eğitimin önemi konusunda bilişsel bir anlayışa sahip olmalarına rağmen duyuşsal alan bağlamında daha az hevesli oldukları görülmektedir.

Anahtar Kelimeler: Metin Analizi, Duygu Analizi, Duyuşsal Alan, Eğitim

Introduction

Educational Data Mining (EDM) is a data mining technology field designed to solve education problems. Dealing with these problems will support students who require guidance, remove and add materials depending on student knowledge and find student's thoughts on a certain topic (Altrabsheh, Gaber and Cocea, 2013). Opinion mining or sentiment analysis (SA) means a methodology that seeks to detect the views expressed in natural language texts at the intersection of mathematics, natural language processing, and computer linguistics. SA may also be used to diagnose emotional conditions and to disclose several trends. In general, these conditions or trends may be found by various methods, including process mining or discourse analysis (Misuraca, Forciniti, Scepi, and Spano, 2020). Text analysis and sentiment analysis provide practical perspectives, promote the development of suitable measures to improve teaching and learning practices (Dietz-Uhler & Hurn, 2013). Determining students' viewpoints by gathering and analyzing data on their learning experience is well accepted in most educational establishments as a key method for measuring teaching efficiency (Mandouit, 2016). Five different kinds of tasks can be used, namely, as a sentiment analysis inside the domain of education: "(i) instruction evaluation, (ii) institutional decision/policymaking, (iii) intelligent information/learning systems enhancement, (iv) assignment evaluation and feedback improvement, and (v) new research insights"(Dolianiti, Iakovakis, Dias., Hadjileontiadou, Diniz., Hadjileontiadis, 2019).

Text analytics and sentiment analysis mat provide practical perspectives, promote the development of suitable measures to improve teaching and learning practices (Dietz-Uhler & Hurn, 2013). Sentiment analysis is an important method since emotions influence the engagement as well as the motivation of students and their actual performances in the educational process. The sentiment analysis is important when considering Bloom's affective domain which is described as, "objectives which describe changes in interest, attitudes, and values, and the development of appreciations and adequate adjustment." (Bloom 1956; Frasson, Heraz, 2012). Determining students' viewpoints by gathering and analyzing data on their learning experience is well accepted in most educational establishments as a key method for measuring teaching efficiency. Thus, the research of student's emotional knowledge help to provide educators with suggestions or educational content based on the emotional state (Ortigosa et al., 2014; Mandouit, 2016; Imani & Montazer, 2019; Misuraca, Forciniti, Scepi, and Spano, 2020; Zhou and Ye, J 2020). The main aim of this research is to examine the opinions and sentiments of university students in the department of social service regarding education as a general concept. Therefore following questions are the main problems of this research:

1- What is the sentimental tone of the students regarding their views on education?
2- Are their sentimental tone varied in terms of their gender?
3- What are the most frequent and relevant words in the context of their views on education?
4- What might be the main message of the students regarding their views on education?
5- What are the probable models that can be proposed regarding their views on education?

Methodology

Design

This research is based on a mixed research design where both qualitative and quantitative data are both used for the analysis for the broad purposes of breadth and depth of understanding and corroboration (Johnson et al. 2007: 123). In the first part of the study, students are asked to write an essay about what does the concept of education means to them. Then the data was analyzed in MATLAB and SPSS and different online text and sentiment analysis tools.

Analysis

First of all, in the sentiment analysis, responses of the students are taken separately for the seoscout online[3] analysis tool given in the footnote. Sentiment polarity is used in the sentiment analysis that can be usually either positive or negative but it can also be expressed as a range such as how much the user liked in the range of very good, good, satisfactory, bad, very bad (Altrabsheh, Gaber and Cocea, 2013). In the analysis of the responses, seven polarities are ranging from very negative to negative to slightly negative to neutral to slightly positive to positive to very positive range. Each response is analyzed in terms of the sentiments for each sentence in terms of frequencies. However, some participants write more sentences some less so that the frequency of each participant is different from each other. Secondly, some participants overweight in terms of particular sentiments so that their frequencies are only in some choices. For instance, for case 3, the participant gives 16 sentences and there are only five sentiments as neutral (f=5), very positive (f=2), negative (f=1), positive (f=2), slightly positive (f=2). For case 1, the participant gives 24 sentences and there are only six sentiments as neutral (f=10) , very positive (f=5), negative (f=2), very negative (f=1), positive (f=1), slightly positive (f=1). For case 1, the participant gives only six sentences and there are only three sentiments as neutral (f=1), very positive (f=2), positive (f=3). Therefore, it is impossible to compare the sentiments of each participant in terms of the frequencies so that the percentage of sentiments for the particular text is evaluated on its own sub-space so that each response is projected on the percentage space or normalized, henceforth, we can compare them each other.

In the analysis of the textual data, word cloud analysis was performed with MATLAB Text Analytics Toolbox. In the analysis of the whole responses, the frequencies of the words and collocations can be given as in table 3.4 in the analysis of the software Voyant tools[4]. Therefore, based on the collocations and the frequencies, these concepts can be clustered via online software in the footnote[5].
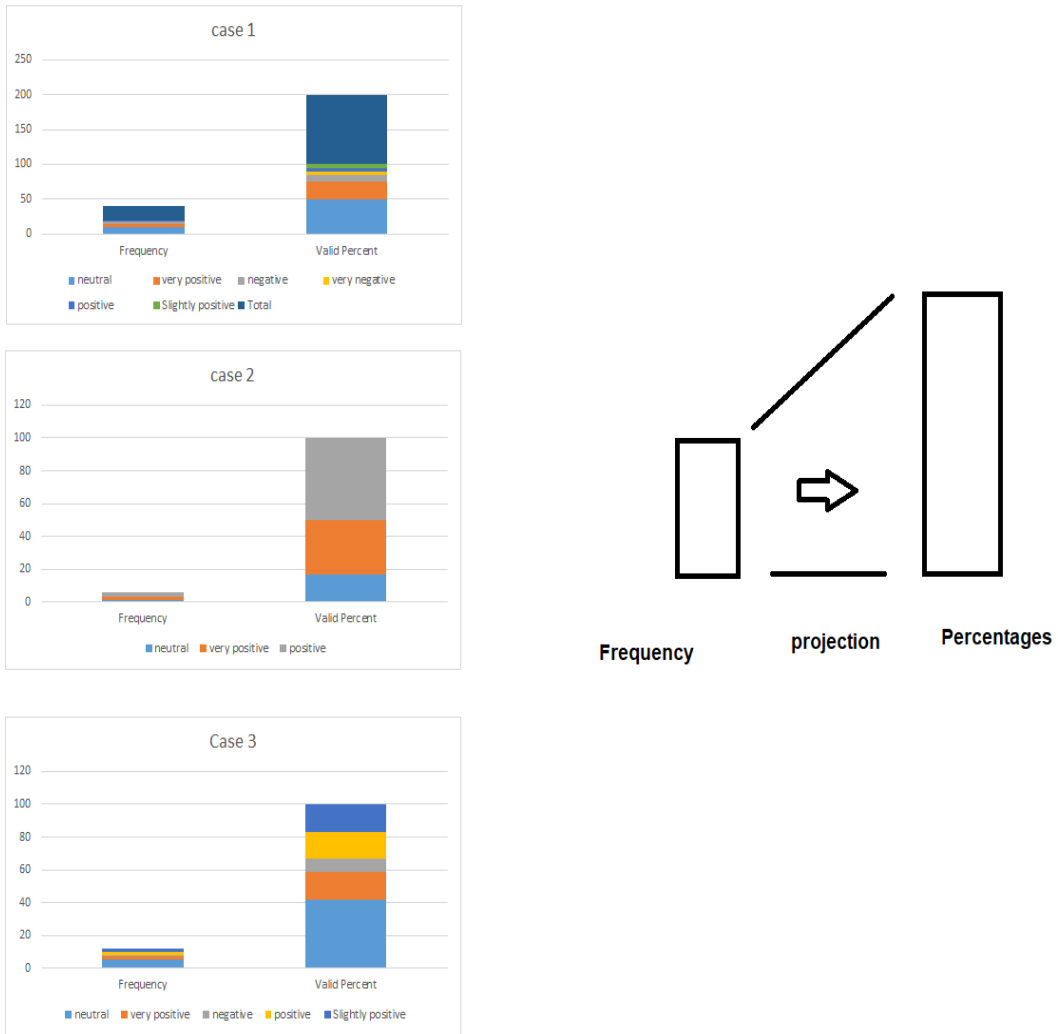
N-gram counting analysis was used to determine the possible main theme of the data. *"An n-gram is a tuple of n consecutive words. For example, a bigram (the case when n = 2) is a pair of consecutive words such as "heavy rainfall". A unigram (the case when n = 1) is a single word. A bag of- n-grams model records the number of times that different n-grams appear in document*

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3 https://seoscout.com/tools/keyword-analyzer retrieved from 26.03.2021
4 https://voyant-tools.org/?corpus=6a2ad6fa7c09333b2db5f26c40f3deb4 retrieved from 27.03.2021
5 https://graphcommons.com/ retrieved from 27.03.2021

Figure 2.1. The frequencies of the sentiments are analyzed in terms of percentages for the comparison of the data.

collections." More detail about word ordering in the original word details can be obtained by using a bag-of-n-grams model. For instance, a model for bag-of-n-grams is best adapted to capture short phrases in the document, such as 'heavy precipitation' and 'wind turbulence.' It is supposed that bag-of-n-grams can be used to capture the main theme of the text in this research (Text Analytics Toolbox, 2020: 7).

Topic model analysis Matlab is based on an LDA model discovering underlying topics in a collection of documents and infers word probabilities in topics (Text Analytics Toolbox, 2020: 16). The topic model analysis is used in this research in terms of the fifth question of the study given as "What are the probable models that can be proposed regarding their views on education?"

Population and Sample

The population of the study consists of the social services department in Iğdır University. The sample was selected from 16 third-grade students in the social services department of which four are male 12 of them are female students based on the convenient sampling method where the main aim is to choose the convenient one in terms of saving money and effort (Baltacı,

2018). The social services department was particularly chosen since social services encompass the services and facilities like education. Therefore, it important to understand how students in this department conceive education and it gives clues how they use this understanding in their future career.

Limitations

The first limitation of this study is its sample since the text analytics and sentiment analysis can be more appropriate to use big data for more coherent and objective descriptions.

The second limitation of this study is that the sentiment and text analysis was conducted translated from the responses because the software is more appropriate in English than Turkish and many sentiment programs in Turkish also use the translation method. Therefore, the sentiments and frequencies might not directly depict the emotions of the students in their language.

The third limitation of the study is the algorithms of the software. More advanced programs and algorithms might give deeper results. In this study, the frequencies of the words and their collocates as well as their graphs were used to interpret the text. It is supposed that bag-of-n-grams can be used to capture the main theme of the text in this research.

Findings
Sentiment analysis of the proportions of the qualitative responses

Firstly, the responses of each student are classified in terms of the proportions of their responses in terms of their answers or world lengths because it is impossible to compare them in terms of the frequencies while some give more sentences but others give less. In table 3.1, the proportions of their qualitative responses and their sentimental values in the range between very negative and very positive are given.

	very negative	negative	slightly negative	neutral	slightly positive	positive	very positive
M	0,00	0,00	0,00	0,00	33,30	0,00	66,70
M	0,00	0,00	0,00	25,00	0,00	75,00	0,00
M	0,00	0,00	0,00	50,00	50,00	0,00	0,00
M	0,00	0,00	0,00	0,00	14,29	28,57	57,14
F	18,75	25,00	6,25	25,00	0,00	6,25	18,75
F	0,00	5,00	0,00	55,00	0,00	10,00	30,00
F	0,00	25,00	0,00	50,00	0,00	25,00	0,00
F	0,00	0,00	0,00	16,67	0,00	50,00	33,33
F	0,00	0,00	0,00	44,44	11,11	11,11	33,33
F	0,00	0,00	0,00	25,00	0,00	50,00	25,00
F	4,17	8,33	0,00	58,33	4,17	4,17	20,83
F	0,00	0,00	0,00	0,00	10,00	50,00	30,00
F	0,00	6,25	0,00	43,75	12,50	12,50	25,00
F	0,00	11,11	44,44	22,22	0,00	0,00	22,22
F	0,00	10,00	0,00	50,00	20,00	0,00	20,00
F	0,00	12,00	12,00	48,00	8,00	8,00	12,00

Table 3.1 Sentiment analysis of the proportions of the qualitative responses

Average values of the sentiment analysis of the proportions of the qualitative responses show that the sentimental tone of the whole responses should be neutral or slightly positive due to the higher slightly positive, positive, and very positive values.
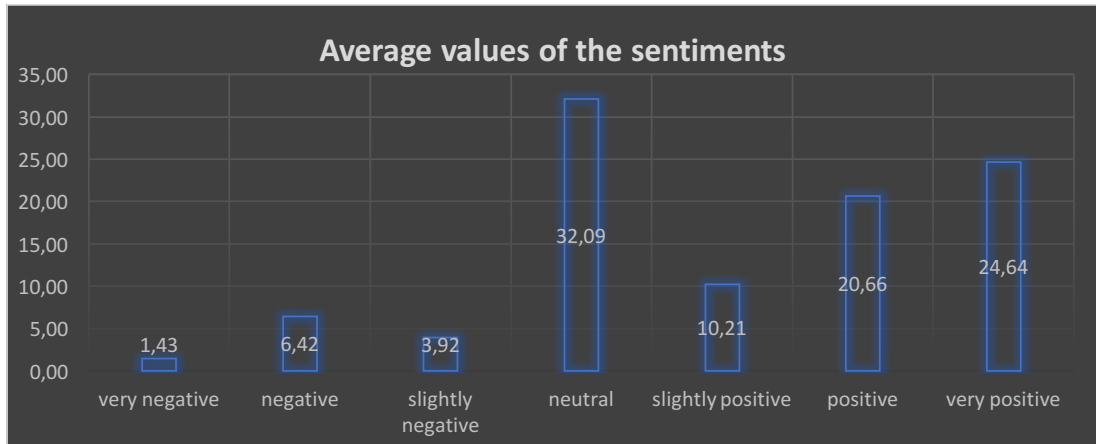

Figure 3.1. Average values of the sentiment analysis of the proportions of the qualitative responses

However, when all the responses are analyzed in the seoscout online analysis tool, it is found that the text has a neutral sentiment. This is also confirmed by another online sentiment tool given in the footnote[6]. The tool says that this text has a sentiment score of 7.1. This means that the overall sentiment or tone of this text is essentially neutral as given in Figure 3.2.
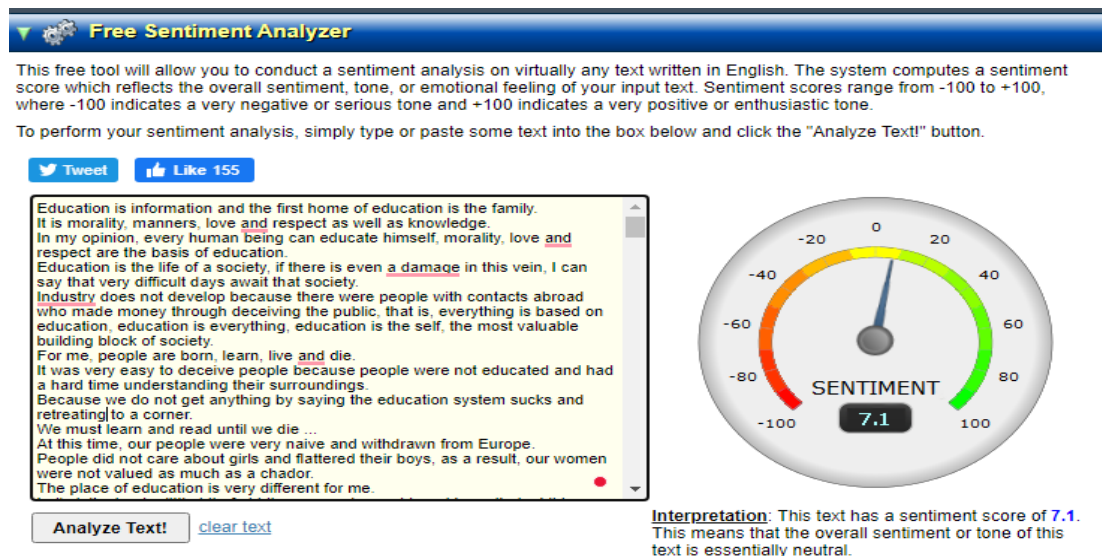

Figure 3.2. The result that the responses are neutral is confirmed by also free sentiment analyzer.

Sentiment analysis of the number of the word counts in terms of the qualitative responses

Secondly, Kruskal Wallis Test for the sentiment analysis of the number of the word counts in terms of the qualitative responses was conducted and it is found that there are significant differences in terms of sentiments for number counts.

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6 https://www.danielsoper.com/sentimentanalysis/default.aspx retrieved from 26.03.2021

Test Statistics[a,b]	
	Words
Chi-Square	50,424
Df	6
Asymp. Sig.	,000

a. Kruskal Wallis Test
b. Grouping Variable: sentiment

Table 3.2. Kruskal Wallis Test for the sentiment analysis of the number of the word counts in terms of the qualitative responses

It is found that sentences having positive, slightly positive tones have more mean ranks than the other tones, Secondly, the sentences in a neutral tone and very positive tones have lesser mean ranks than the others.

	Ranks			
	Sentiment	N	Mean Rank	Mean rank per sentence
Words	Neutral	68	68,15	1,00
	very positive	40	68,49	1,71
	Negative	14	88,93	6,35
	very negative	4	85,50	21,38
	slightly negative	8	97,50	12,19
	Positive	25	129,06	5,16
	Slightly positive	12	144,88	12,07
	Total	171		

Table 3.3. Kruskal Wallis Test for the sentiment analysis of the number of the word counts in terms of the qualitative responses

If we categorize the sentiments in the range of 60-80 labeled as very low, 80-100 labeled as low, 100-120 labeled as moderate, 120-140 labeled as high, 140-160 labeled as the highest range, we can conclude that neutral and very positive tones have the lowest word counts, negative, very negative, slightly negative have moderate word counts, positive has high word counts and slightly positive has the highest word counts. It seems that students who are in positive and slightly positive mode are more prone to use more words to show their emotions while students are in a neutral tone are more inclined to use fewer words. However, the mean rank values per sentence should be taken also into consideration because, for example, there are only 4 very negative responses having 88,50 mean rank while 68 ranks are having 68,15 mean rank so that mean rank per sentence may give us the intensity of sentiments per words.
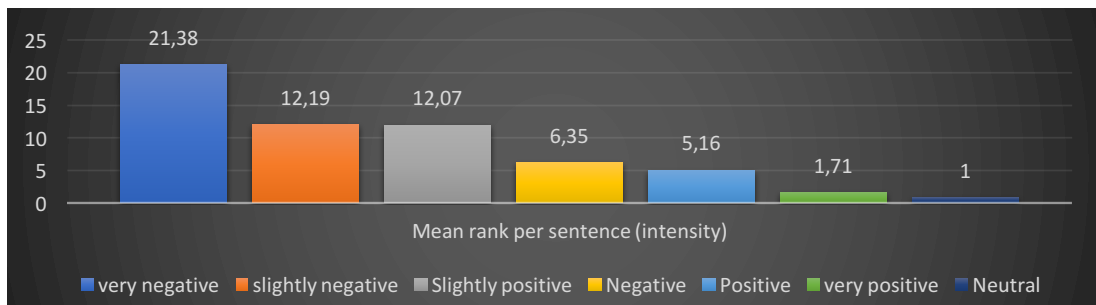
Figure 3.3. The intensity of sentiments per words of the qualitative responses

Sentiment analysis in terms of gender

Sentiment analysis in terms of gender shows that the range of the female students in terms of their sentiments is broader than the range of the male students. The range of male students is only in the sentiments of neutral, slightly positive, and positive dimensions whereas the range

of female students covers all the dimensions. However, it is observed that sentiments of both genders are slightly more in the positive dimension than the negative dimension.
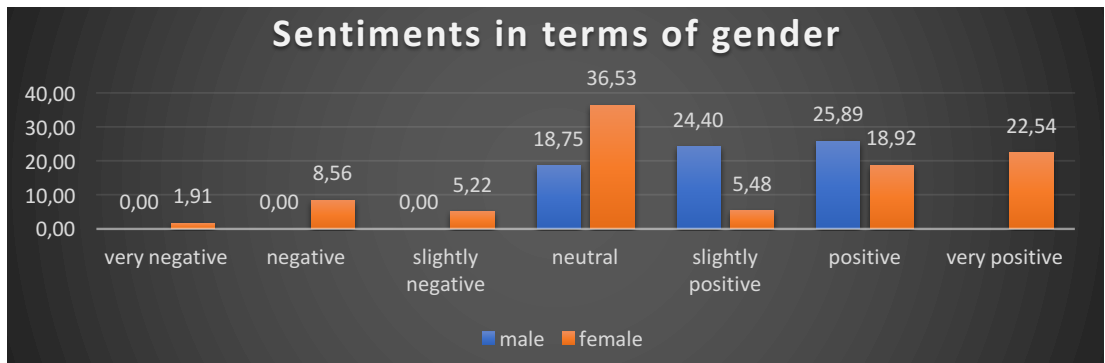

Figure 3.4. Sentiment analysis in terms of gender

Cloud and frequency analysis of the words

The cloud and frequency analysis of their qualitative responses can be given in Figure 3.5. When the cloud scheme is examined, it can be seen that the education term is the most used concept in their responses and it is natural to see this because the main question is education. People, knowledge, school, development, increase, improve, future can be related to the main keywords according to word cloud.
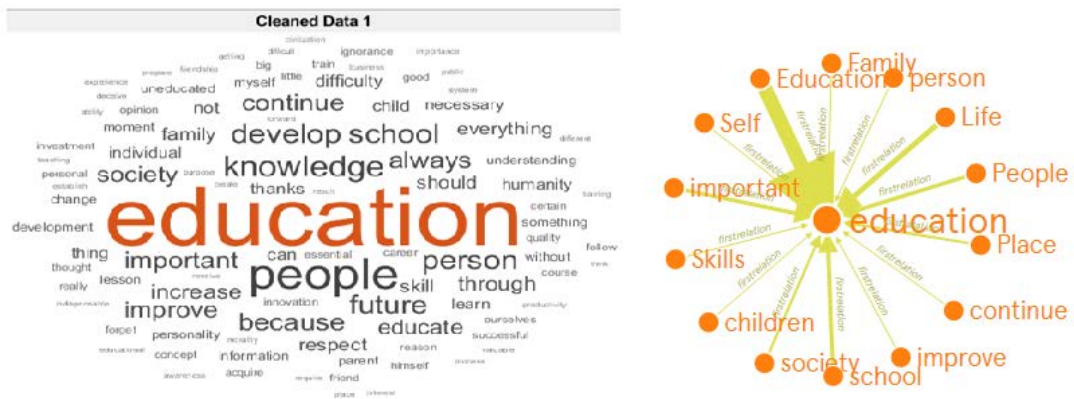

Figure 3.5. Word clouds (left figure) the graph of the words according to collocations (right figure)

In the analysis of the whole responses, the frequencies of the words and collocates can be given as in table 3.4 in the analysis of the software Voyant tools[7]. Therefore, based on the collocations and the frequencies, these concepts can be clustered via online software in the footnote[8]. According to clustering of the data cluster of education having 15 nodes (8%) seems to be the most significant cluster in the context of the responses of the students (Figure 3.5 right). The main words are education, continue, place, person, life, skills, important, children, people, family, school, self, education, society. However, it should be emphasized that there is no significant clustering about the views of the students higher than the data cluster of education, they have very few nodes and seem to be insignificant in that respect.

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[7] https://voyant-tools.org/?corpus=6a2ad6fa7c09333b2db5f26c40f3deb4 retrieved from 27.03.2021
[8] https://graphcommons.com/ retrieved from 27.03.2021

Main concepts					Collocates					
Concept	Word1	fr1	word2	fr2	word3	fr3	word4	fr4	word5	fr5
Education	education	31	life	12	important	9	school	9	people	8
People	education	9	people	6	develop	4	educated	4	knowledge	4
Life	education	13	place	4	socety	3	child	2	develop	2
Knowledge	skills	5	people	4	education	3	acquire	2	changes	2
School	education	10	people	3	family	2	friends	2	learning	2
Future	better	5	education	5	children	2	future	2	offer	2
Person	education	2	influence	2	person	2	society	2	age	1
İmportant	education	8	place	3	people	2	age	1	boasting	1
Develop	people	4	society	3	education	2	life	2	make	2
Society	education	5	life	4	develop	3	place	3	person	2
İmprove	education	4	continue	2	improve	2	country	1	course	1
Place	education	5	life	4	society	3	necessary	2	understanding	2
Continue	education	3	improve	2	add	1	afford	1	ambition	1
Educated	people	5	parent	3	family	2	parents	2	uneducated	2
Family	education	4	educated	2	goes	2	able	1	acquired	1
Learn	read	3	right	3	die	2	people	2	able	1
Skills	education	3	necessary	3	acqiure	2	understanding	2	Abilities	
Children	education	2	people	2	acquire	1	Understanding	2	Abilities	1
Love	respect	3	right	2	wrong	2	basis	1	burning	1
Right	learn	3	wrong	3	education	2	love	2	right	2
Self	education	3	confidence	2	forward	2	individuals	2	life	2
Thanks	educaton	7	way	2	adds	1	away	1	better	1
Time	actually	1	certain	1	die	1	educated	1	improve	1

Table 3.4. The collocations and the frequencies in terms of main words

N-gram analysis of the text

N-gram analysis of the text shows that students mostly relate education with necessary skills or understanding for society. One participant comments on this: "First of all, education is to help new generations acquire the knowledge, skills, and understanding necessary to take their place in the life of society and develop their personalities." so that some students think that education is a necessary step both for individual and social development. Another participant also says that "It helps children and young people to acquire the knowledge, skills, and understanding necessary to have a place in social life and to develop their personalities." so similar arguments regarding its necessity for social and personal life was, therefore, emphasized. Another participant underlines this necessity by saying that "Education is almost as necessary as taking a breath."

skill understanding necessary society develop
acquire knowledge skill understanding necessary
knowledge skill understanding necessary society

understanding necessary society develop personality
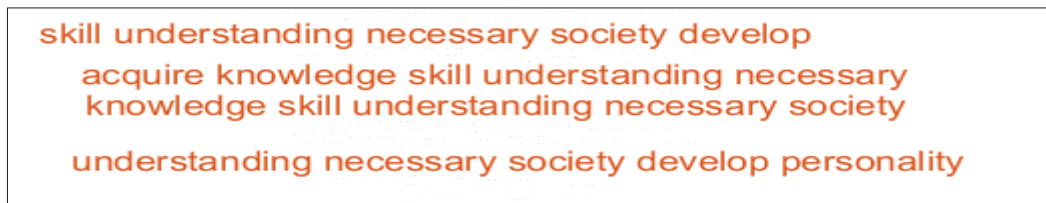
**Figure 3.6.** Main N-gram counting analysis results in MATLAB

When table 3.6 is examined more deeply, the comments of the students can be compared based on the results. For example, one participant underlines the necessary knowledge and skills in informal education by saying that "It is the most important factor for people to develop the necessary knowledge and skills that should be acquired by the family and their environment from the moment they are born."Therefore, some students consider the importance of education for society. For example, one participant commented by saying "Education is the life of a society, if there is even a damage in this vein, I can say that very difficult days await that society." Another participant also gives similar ideas by stating "It helps children and young people to acquire the knowledge, skills, and understanding necessary to have a place in social life and to develop their personalities." Some highlight the importance of education in the context of economics in social life by saying "Industry does not develop because there were people who want to make money through deceiving the public, that is, everything is based on education, education is everything, education is the self, the most valuable building block of society."

Topic analysis of the text

The topic analysis gives the possible models that emerged from the data. The first model includes the remarks of the participant saying that "In other words, education is the concept that will carry humanity forward, establish civilizations and develop the world that will make reforms." Similarly, the comment saying that "If education is for me; Education is a forward-looking study of self-development, developing abilities, forward-thinking, increasing vocabulary; education is the knowledge and skill learned both at school and from the people of a job." by the same participant was taken into account also. It also includes the comments stating "It was very easy to deceive people because people were not educated and had a hard time understanding their surroundings." This was also taken into account. The fourth line is probably taken from the statement saying "First of all, education is to help new generations acquire the knowledge, skills, and understanding necessary to take their place in the life of society and develop their personalities.". The final line seems to be related to the comment stating "Because little knowledge has always put people in trouble.". When those comments are synthesized, education is a very important concept for developing skills and learn new things. Without education, people can be misled in many respects so it makes things worse or troublesome in terms of uneducated people.

Words						
"acquire"	"knowledge"	"skill"	"understanding"	"necessary"	2	5
"knowledge"	"skill"	"understanding"	"necessary"	"society"	2	5
"skill"	"understanding"	"necessary"	"society"	"develop"	2	5
"understanding"	"necessary"	"society"	"develop"	"personality"	2	5
"industry"	"develop"	"because"	"people"	"contact"	1	5
"everything"	"education"	"valuable"	"building"	"society"	1	5

Table 3.6. Some of the N-gram counting analysis results in MATLAB
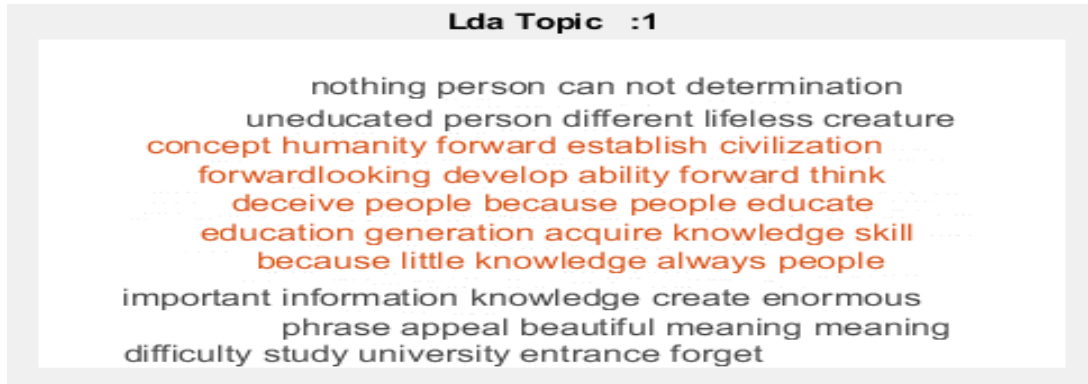
Figure 3.7. The first model of the topic analysis of the text

The first line of the second model is related to the comment saying that "It is the most important factor for people to develop the necessary knowledge and skills that should be acquired by the family and their environment from the moment they are born." Second-line seems to be connected with the comment stating "The knowledge, skills, and attitude gained through education increase the awareness of being an individual and belonging, develop their personality and make them more valuable." Third-line is related to the comment stating "The person continues to exist by learning and teaching, the biggest concept that guides my education life in order not to suffer in the future to survive, to improve me in the future, I will not quit and it is the way I should continue to add more to me by learning something every day." The fourth line is related to the comment stating "In other words, education is the concept that will carry humanity forward, establish civilizations and develop the world that will make reforms.". The final line related to the comment saying "In primitive times, when people were achieving something, they used it daily and what they were not benefited from their work in the long term, but this has always continued like this because of uneducatedness." The second model probably indicates that informal education is also important. Furthermore, education is important to develop the personality and to make people feel more valuable by increasing awareness and the idea of self. Education is also indispensable for individuals for surviving both in terms of economically and socially. Furthermore, its benefits can be seen in the long run rather than daily concrete rewards.

The first line of the third model is related to the comment saying "With education, we can always proceed on the right path, we have a goal and focus on this goal, and as we focus on our goals, our contributions to humanity increase." The second line is corresponding to a comment stating " A good education also makes life more enjoyable and interesting by helping the person to develop new interests." The third line is associated with the comment saying "It was very easy to deceive people because people were not educated and had a hard time understanding their
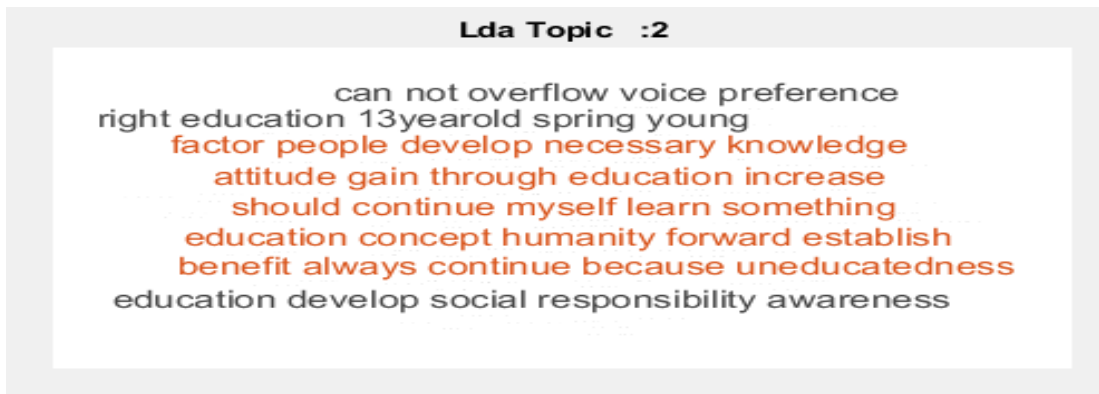
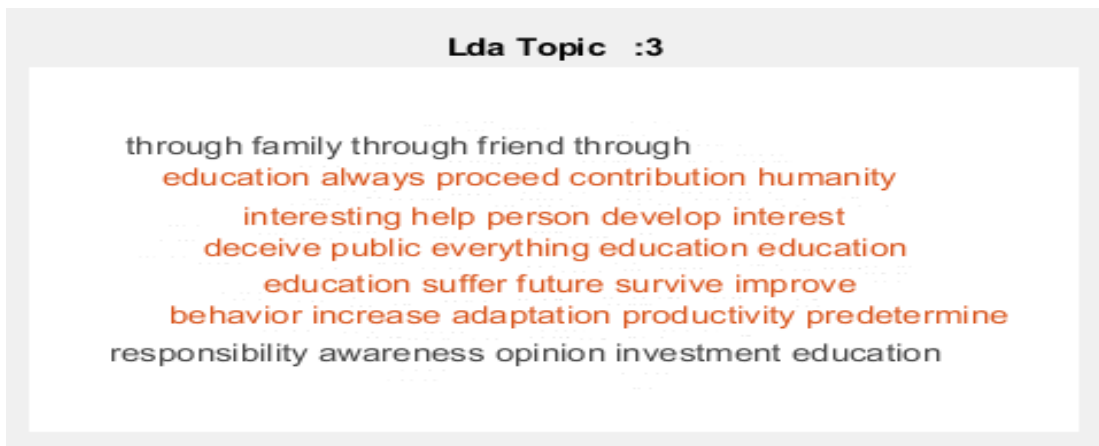**Figure 3.8.** The second model of the topic analysis of the text

Figure 3.9. The third model of the topic analysis of the text

surroundings." The fourth line is linked to statements expressing "The person continues to exist by learning and teaching, the biggest concept that guides my education life in order not to suffer in the future to survive, to improve myself in the future, I will not quit and it is the way I should continue to add more to myself by learning something every day." The fifth line is related to the comment stating "For me, education is an effort to shape, improve and develop people's thoughts and behaviors to increase their adaptation and productivity in line with predetermined goals regarding the present and future." The possible synthesized model that can be given based on these comments is that education leads students on the right path and a good education makes life more enjoyable and interesting. Furthermore, education prevents people from ignorance and its negative effects like being deceived by others and it also helps individuals to be prepared for their future career and life by increasing their adaptation and productivity in line with predetermined goals regarding the present and future.

The first line of the fourth model is related to the comment saying "An educated person cannot imagine a society without education." The second line is corresponding to the statement saying "Knowledge is very important to me since the age we live in is the age of information and knowledge creates enormous differences in human beings." The third line seems to be linked to statement expressing "Industry does not develop because there were people with contacts abroad who made money through deceiving the public, that is, everything is based on education, education is everything, education is the self, the most valuable building block of society."

The fourth line is linked to a comment stating "... education has always provided people with knowledge and experience.". The fifth line is associated with the expression stating "In short, it enables people who are ethical to establish a free, higher-quality connection with life." The fourth model can be synthesized so that education is important because it can create an enormous difference between the educated individual and non-educated one and this can be also realized employing education. The most valuable building block of society is related to education because it provides people with knowledge and experience so they can establish a free, higher-quality connection with life.
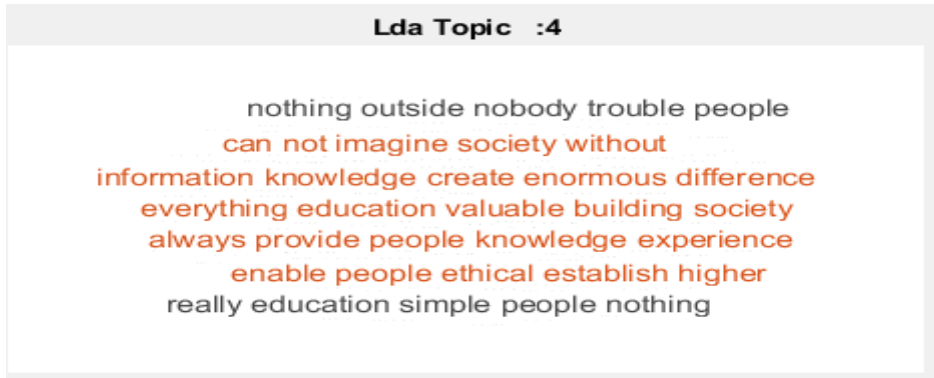

Figure 3.10. The fourth model of the topic analysis of the text

Discussion and Conclusion

The findings regarding the first question of the study given as "What is the sentimental tone of the students regarding their views on education?" shows that the sentimental tone of the whole responses is neutral but there is a slightly positive tone due to the higher slightly positive, positive, and very positive values. This may show that they have a lack of passion or enthusiasm regarding the education since they have a neutral tone. It is thought that they can express their ideas more positively and passionate way if they think that education is advantageous for themselves or society because people are supposed to use a more positive tone when they express their positive ideas or excitement about particular concepts (reference). However, they have neither negative feelings and emotions about education so that they probably don't feel that education is useless. When considering Bloom (1956)'s affective domain as objectives describing improvement in the motivation, perceptions, and values and the creation of perceptions and adequate adjustments", neutrality might imply that students are supposed to be in the lower dimensions of affective domain since they don't reflect the affective side of their views on education. Furthermore, it is interesting to note that the mean rank per sentence is higher for very negative and slightly negative sentiments. In other words, the negative intensity of sentiments per word can be linked with particular associations. Sentiment analysis looks at the polarity of sentiment. Researchers are mainly interested in positive and negative emotions even though certain researchers support the application of a neutral category (Altrabsheh., Cocea, Fallahkhair, 2014). Actually, neutral category is also important because it gives clues about the motivation of the students in some contexts as well as it gives us hints regarding their objectivity in certain circumstances. To sum up, the sentiment was connected to academic achievement: the enthusiasm of students was positively linked to educational achievement (Liu et al., 2018). Therefore, the neutrality of their responses might imply that they have less motivation in terms of educational enthusiasm.

The findings regarding the second question of the study given as "Are their sentimental tone varied in terms of their gender?" show that the range of female students regarding their sentiments is broader than the male ones. The sentiments of the male students cover only the sentiments of neutral, slightly positive, and positive dimensions whereas the range of female students covers all the dimensions. As indicated by Parkins (2012) "statistically significant body of research has found that women are the more emotionally expressive gender in the realm of face- to-face communication". It seems that this situation can be observed in the written texts. However, it should be noted that sentiments of both genders are slightly more in the positive dimension than the negative dimension. Therefore, it is probable that gender is not so effective variable affecting the views on education.

The findings regarding the third question of the study given as "What are the most frequent and relevant words in the context of their views on education?" show that the education term is the most used concept in their responses and it is natural to see this because the main question is education. People, knowledge, school, development, increase, improve, future can be related to the main keywords according to word cloud. According to clustering of the data cluster of education having 15 nodes (8%) seems to be the most significant cluster in the context of the responses of the students. The main words are education, continue, place, person, life, skills, important, children, people, family, school, self, education, society. It is worth noting, though, that the opinions of students are not greatly segregated, but those clusters have very few nodes and tend to be negligible in this regard. It seems that the concept of the students are not restricted within the boundaries of the schools because they imply the benefits and importance of informal education but their arguments and frequent words are not abstract concepts but more concrete words like people, knowledge, school, development, increase, improve, future. This can be explained by the fact that they are not students of education faculties or pedagogy departments so that they are more likely to express their ideas based on tangible words.

The findings regarding the third question of the study given as "What might be the main message of the students regarding their views on education?" Some students view education as an indispensable requirement both for the development of individuals and society since it encourages individuals to learn and grow the experience, abilities, and understanding required to have a role in social and personal life. It is vital because the industry does not develop without education and people can be easily misled without it also.

The findings regarding the fifth question of the study given as "What are the probable models that can be proposed regarding their views on education?" show that there are possibly four models of topics in the text. In the topic model analysis, the first model implies that Education is a very relevant term for knowledge growth and new learning. Without education, it is easy to make problems bad or troubled for uneducated citizens by manipulating people in certain ways. The second model probably indicates that informal education is also important. Education is also important for the growth of the personality and for making people more precious by increasing consciousness and self-conceptions. Education is therefore important both economically and socially for individuals to succeed. In addition to the occasional incentives, their advantages can be observed in the long term. The third model proposes that education takes students on the right track and education boosts the enjoyment and interest in life. Besides, education avoids ignorance and its harmful consequences like those are misled and allows citizens to become educated for potential careers and existence following predetermined current and future objectives by increasing their adaptation and effectiveness. The fourth model can be synthesized so that education is important because it can make a huge difference between educated and uneducated

people and this can also be achieved by training. It offers citizens wisdom and knowledge such that they can have a free, higher-value link with existence. Therefore, it can be concluded that students view education,

- as a basis of information, knowledge, morality, and love
- as a basis of society and salvation for the humanity
- as a concept covers all the process of the daily activities and life
- as a tool for personal and social improvement and development for the future or personal career
- as a medium that makes people happy
- as a process raising awareness
- as a medium for giving equal opportunities

To summarize, it seems that although students have cognitive understanding regarding the importance of education they are less enthusiastic about it in the context of the affective domain.

Suggestions

Taking into account the features of sentiments or opinions of the students, the motivational levels of the students can be determined and students at risk in terms of having lower motivation can be identified and intervened (Liu et al., 2019). The usage of SA and text analytics will improve relevant curriculum processes and visually display the outcomes to render the learning intervention simpler for the instructor or researchers (Zhou and Ye, J 2020). Additionally, sentiment analysis can be studied by using different tools such as surveys, interviews, and different analysis methods like content analysis, correlational analysis, etc. Furthermore, different algorithms can be developed for better analyzing texts in different languages based on deeper and stronger algorithms.

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