The Process of Inquiry-Based Teaching Practices from the Perspective of Prospective Mathematics Teachers

Rabia Sarıca - Bayram Çetin*

Abstract:

Introduction: Inquiry-based teaching is a constructivist-based method that has become popular in recent years. In this method, students work in a systematic way like a scientist during the research process, actively participate in the learning process, solve problems and learn in practice. The aim of this study is to reveal the opinions of prospective teachers about inquiry based teaching practices.

Methods: The study was designed in a qualitative research design. The participants of the study are primary mathematics teacher candidates. Data were collected through semi-structured interviews conducted face-to-face with the students. The data were analyzed using content analysis. The findings obtained from the analysis of the prospective teachers' views were presented with the relevant themes and codes under the titles.

Results: Some of the findings of the prospective teachers' opinions about the process in which inquiry-based teaching method is applied are as follows. It provides permanent learning, is suitable for real life, develops skills such as research, problem solving, leadership, motivates and gives experience to the profession, is learned actively by doing and experiencing in the process, unexpected difficulties are encountered, the traditional method is easier, not suitable for every course, the lecturer should give more feedback and guidance, communication and coordination in group work is required.

Discussion: Prospective teachers stated many positive opinions about the process in which the course content was taught using inquiry-based method. It can be said that the application process positively influences the practical knowledge and skills of teacher candidates. However, it is seen that some prospective teachers find the process tiring and time consuming. It is understood that teacher candidates have intense concerns about Public Personnel Selection Examination (KPSS) and this affects the process.

---
* Rabia Sarıca, Ahi Evran University, Kırşehir, Turkey; rabiasarica@gmail.com
  Bayram Çetin, Gazi University, Ankara, Turkey; bcetin27@gmail.com

KPSS is a test in Turkey for prospective teachers where they should get enough points to be appointed as teachers after graduation. Although the participants of this study are 3rd grade prospective teachers and they take the KPSS exam after graduation; it is understood that KPSS affects them and their motivation.

Limitations: This research is limited to the measurement and evaluation course and to the 3rd grade mathematics teacher candidates who are the participants of this study.

Conclusions: Prospective teachers mostly have positive opinions about the inquiry-based teaching process. It can be said that it would be beneficial to use this method in teacher education.

Key words: inquiry-based teaching, prospective teachers, teacher education.

Introduction

One of the most prominent learning-teaching approaches along with the changes in the understanding of education is inquiry-based learning-teaching. Inquiry-based learning is a student-centered approach that has been emphasized in recent years, which draws attention to the acquisition of extremely important skills for today's world, such as research-inquiry, learning to learn and problem solving. It is stated that the foundations of inquiry-based learning that focuses on high-level thinking skills rather than learning of knowledge are based on Socrates' questioning approach, Dewey's problem-solving method and constructivism philosophy (Bostan-Sarıoğlan et al., 2016). According to Feletti (1993), inquiry-based learning is an approach that offers students the opportunity to customize their knowledge through exploration, research and observation, that is, to create meaning individually (as cited in Chang et al., 2016).

Students are not passive recipients of content in inquiry-based learning environments. On the contrary, they actively participate in the process and achieve their own learning, in particular by linking new information with their previous knowledge. The students who are responsible for their own learning reach the sources of information by researching, associate the new information with the previous ones, and create new information by using research and reasoning in this process (Alkan-Dilbaz, Yanpar-Yelken, & Özgelen, 2013). In this approach, which is based on open-ended, student-centered, hands-on learning through hands-on activities, students actively participate in the teaching-learning process in contrast to teacher-centered classes (Chang et al., 2016). Concerning inquiry-based learning, Heindl (2019) reports that Messner (2009) considers this type of learning as a preliminary stage for project-based, research/exploration and problem-based scientific studies and Reitinger (2013) explains the basic components of this definition of learning as cognitive interest, discovery, hypothesis formation, methodology determination, negotiation-

discourse and publication of results. According to Tatar and Kuru (2006), in the inquiry-based learning process, students work like scientists and use scientific research methods. Students plan, practice and evaluate their own research processes. At the same time, they learn the subject content practically, which means they learn by doing and experiencing. Students sometimes study individually and sometimes study in groups.

According to Akınoğlu (2004), in inquiry-based teaching (IBT), which is one of the teaching practices of the constructivist paradigm, after the problematic situation is presented to the students by the teacher, the students formulate hypotheses and collect the necessary information by selecting the appropriate methods, they work on the data they collected and make comments, and they present and discuss the result in the classroom, or in other appropriate settings. Therefore, the first stage of this learning approach is exploring, the second stage is sharing and discussing the content, and the third stage is the practice and development. It is stated that inquiry-based learning can be applied in various ways, but is often characterized by practical scenarios, and these scenarios direct students to deep learning on the subject, and that students study in small groups to determine learning areas and research topics and give feedback to each other and in this way, they gain extensive information about many practical ideas (Stacey et al., 2018). It is expressed that in the inquiry-based learning process, students actively solve problems, make discussions, access information by themselves and inquire about the information they access and it is stated that their skills to take responsibility, study in a group and treat their friends with respect will be developed and their self-confidence will be increased in these ways (Duran & Dökme, 2018). It is specified that inquiry-based teaching, which is an effective teaching strategy, can be in the form of a problem or task to enable and increase the participation of students. However, it is emphasized that it is still unclear how students will be involved in purposeful research activities; these kinds of problems should be solved especially for social sciences courses (Hwang et al., 2015).

There is a growing interest in this approach in Turkey, as well as abroad. This interest is observed both in the increase in the academic studies related to the subject and in the curriculum studies carried out by the Ministry of National Education (MNE). In the updated science curriculum, students are expected to be raised as individuals who are responsible for their own learning by forming their learning through discovery and questioning processes, who can actively obtain information by researching-questioning and doing-experiencing, who can question and transform the obtained information into a product, who can cooperate and who have advanced communication skills (MNE, 2018). It is also stated in the same educational program that an inquiry-based learning approach is selected as a baseline for science course as an interdisciplinary perspective. It is observed that STEM, which is an interdisciplinary approach, comes to the forefront in the program. It is seen that the studies related to inquiry-based

teaching are concentrated especially on science classes and mostly in primary and secondary school levels. Applying this method not only in certain disciplines such as science courses, but also in different disciplines such as social sciences, medicine, law and at different levels is considered important. Therefore, in this study, the undergraduate level was chosen as the level; measurement and evaluation, which is one of the professional teaching knowledge courses, was chosen as the course. Also, the prospective teachers were selected as participants. It is reported that the number of studies showing the benefits of inquiry-based learning is increasing, but technically, it is ineffective due to teachers' traditional beliefs, perceptions and inadequacies in practice (Duran & Dökme, 2018). Considering all these together, prospective teachers are required to train their students with the competence to research and produce knowledge, since they will teach in the information age. Theoretical information about these approaches is given to prospective teachers frequently and intensively. However, in order to be able to apply these approaches and methods in the classroom, they must first have sufficient experience in this field. The aim of this study is to reveal the opinions of prospective mathematics teachers about the inquiry-based teaching practices after experiencing the measurement and evaluation course, one of the undergraduate courses as inquiry-based teaching practices.

1   Methods

In this study, it is aimed to investigate the opinions of prospective mathematics teachers about inquiry-based teaching practices. This study covers the qualitative part of the thesis in which both qualitative and quantitative approaches used. In the thesis study, an inquiry-based teaching-oriented course was conducted and the opinions of prospective teachers (PT) about this process were revealed and examined. The course, which is focused on inquiry-based teaching method, is a measurement and evaluation course in the undergraduate programs of teaching. Measurement and evaluation course (ME) was conducted during the semester in the form of inquiry-based teaching activities and the opinions of prospective teachers about this process were investigated. Qualitative research approach was adopted in the study. The qualitative research approach is used to discover and learn the meaning that individuals or groups attribute to a social issue or phenomenon (Creswell, 2013). The most typical feature of qualitative research is that the subject is discussed from the point of view of the participants (Ekiz, 2009).

1.1 Participants
The participants of the study consisted of 3rd grade junior mathematics teaching students studying at Gaziantep University in Turkey. The experimental group of the study consists of 30 prospective mathematics teachers. Twenty-four of the

participants were female, six of the participants were male, and the mean age of them is 21.30. Table 1 shows detailed information regarding the study group.

Table 1

Information about participants

Quality	Level	f	%
	3.01 to 4.00	4	13.3
General Academic Average	2.01 to 3.00	25	83.4
	1.00 to 2.00	1	3.3
	Between 2000 Turkish Lira (TL)- 500 TL	10	33.3
Average Monthly Income of the Family	Between 3500 TL- 2001 TL	13	43.4
	Between 5000 TL- 3501 TL	5	20.0
	50001 TL and more	2	6.7
Personal Computer	Available	23	76.7
	Not available	7	23.3
Quick and Accurate Search on the Internet	Yes	28	93.3
	No	2	6.7
	Illiterate	1	3.3
	Primary school graduate	13	43.3
Mother's Educational Status	Secondary school graduate	4	13.3
	High school graduate	8	26.7
	University/College graduate	4	13.3
	Illiterate	-	-
	Primary school graduate	5	16.7
Father's Educational Status	Secondary school graduate	7	23.3
	High school graduate	9	30.0
	University/College graduate	9	30.0
	Dorm	5	16.6
	With a relative	1	3.3
Shelter	At home with friends	7	26.7
	With family	11	36.7
	Apart house	5	16.7
	Internet	26	57.8
Resources Used to Access Information	Library	5	11.1
	Books, magazines etc. available at home.	8	17.8
	Experts	6	13.3

1.2 Data analysis
Afterwards, the data were analyzed by content analysis. In the content analysis process, the data are examined systematically and thematically in the context of categories (Saban, 2009). Within the scope of this study, the data were analyzed by the researcher and the expert. The expert, who has worked in this process, is an academician who is an expert in the fields such as statistics, assessment-

evaluation, qualitative and quantitative data analysis and has many studies in these fields. In the process of qualitative data analysis, firstly, the researcher and the expert worked independently and designated the themes. They then came together to discuss themes, such as the names of the themes, codes, criteria, and they worked until they adopt a common decision. After a common decision was taken on the theme names, the similar process was repeated, and the scope of the theme and the sample sentences were created in such a way that there was no difference of opinion. Afterwards, they decided to collect the similar themes under the same title by considering the scope of the agreed themes. In this context, the following titles were established for all data analyzed. These titles are as follows:

1. the benefits of inquiry-based teaching for the measurement and evaluation course;
2. the benefits of inquiry-based teaching to gain skills;
3. the benefits of inquiry-based teaching to getting ready for the profession;
4. characteristics of inquiry-based teaching process regarding individuals;
5. characteristics of the nature of the inquiry-based teaching process;
6. characteristics of the inquiry-based teaching process regarding the instructor;
7. factors affecting inquiry-based teaching;
8. negative aspects of inquiry-based teaching.

Information on the agreed themes, codes, and criteria regarding these are given in Table 2.

Table 2

Themes, codes and criteria

Title	*Theme*	*Codes*	*Criteria*
The benefits of inquiry-based teaching for the measurement and evaluation course	The process carried out with IBT activities ensures permanent learning.	Permanency	Statements related to permanent learning are evaluated in this context.
	Using IBT in the ME course provides an opportunity to see how information is applied in real life.	Appropriate to real life	Sentences regarding the appropriateness of knowledge and teaching to real life are evaluated within this scope.
	The use of the IBT process in the ME course raises awareness of the importance of test development, exam preparation, question	Awareness	Emphasizing the importance of the subjects of the ME course and sentences indicating that this is understood are evaluated in this

	writing, and item analysis.		context.
	IBT develops research skills and enables them to be used in daily life.	Research skills	Statements related to research skills are evaluated in this context.
	In IBT, group study develops students in terms of developing friendship, self-expression, and peer learning.	Group study improves the students	The expressions for the benefit of group study are included in this scope.
	IBT allows students to socialize.	Socialization	Expressions such as stating that sociality is gained in the process where this method is used are evaluated within this scope.
The benefits of inquiry-based teaching to gain skills	The IBT process improves problem-solving skills.	Problem-Solving	Conditions such as problem solving, revealing the problem, determining the problem are examined in this context.
	The IBT process improves interpretation skills.	Interpretation	Making interpretations and inferences are evaluated in this context.
	Group study conducted in IBT improves leadership characteristics and self-confidence.	Leadership and self-confidence	Leadership and related statements in group studies and sentences stating that it reinforces self-confidence are evaluated within this scope.
	Students who are interested in different and extraordinary practices are not concerned about inquiry-based learning.	Extraordinariness	Sentences indicating that the activities are extraordinary and interesting are examined in this context.
	The IBT process improves individual	Decision-making	The statements regarding the decision-

	and collective decision-making skills.		making process and decision-making skills are evaluated within this scope.
The benefits of inquiry-based teaching to getting ready for the profession	Using IBT in the ME course gives the opportunity to get to know the real school environment. This is a good experience for prospective teachers before they start serving.	Gaining experience	Expressions that processing ME with IBT activities gives PT the opportunity to get to know the schools and that it is a good experience for PT before the service are evaluated in this context.
	The use of the IBT process in the ME course motivates teacher candidates to the profession.	Professional motivation	The statements suggesting that teaching the ME course with IBT practices increases motivation for the teaching profession.
	The use of IBT in the ME course gives the prospective teacher the opportunity to identify students' misconceptions.	Misconception	It includes the situations that the PT realizes the misconception of the students according to the activities carried out.
Characteristics of inquiry-based teaching process regarding individuals	In the inquiry-based method, the student undertakes the responsibility of learning.	Responsibility	PT's statements that the responsibility for learning during the process belongs to the students are included in this scope.
	The student must be active in the IBT process.	Active students	It includes the statements of the PT about students being active during the process.
	In the IBT process, the individual should obtain the information from different sources and effectively.	Obtaining information	The statements reflecting the opinions on gaining information in the IBT process are included in this scope.

	During the IBT process, the student also studies outside the class hours.	Out-of-class activity	It covers the statements regarding performing extracurricular activities.
	In IBT, the student should use time well.	Time	It covers the use of time effectively by the PT when performing activities in the process.
	In the IBT process, the student can make mistakes until she/he reaches the correct information.	Making mistake	It includes statements about making mistakes until obtaining the reliable information and correcting the mistakes in the process.
	In IBT, the individual enters into an intensive process of asking questions.	Asking question	It includes statements that the process begins and continues with asking questions.
Characteristics of the nature of the inquiry-based teaching process	In inquiry-based teaching, students learn by doing and experiencing.	Learning by doing- by experiencing	Expressions related to learning by doing and experiencing in the process.
	Unexpected challenges may occur during the IBT process.	Unexpected challenges	It covers unexpected difficulties and problems in the process.
	Traditional teaching is easier than inquiry-based teaching.	Traditional-easy	Sentences suggesting that the traditional approach is easier.
	The IBT method is not applicable for every course.	Not applicable for every course	These are the opinions stating that this method is not applicable for every course.
	The use of IBT activities in the ME course is not intended to prepare the prospective teachers for the KPSS (Public	KPSS	It covers the opinions such as the ME course carried out by this method does not prepare the prospective teachers for the KPSS.

	Personnel Selection Examination).		
	In inquiry-based teaching, students learn by doing and experiencing.	Compliance with the course	It covers the statements such as this method may be particularly appropriate for ME and other educational science courses, but may not be applicable for some field/Mathematic courses.
Characteristics of the inquiry-based teaching process regarding the instructor	Students should be given more guidance and feedback for IBT.	Guidance and feedback	It covers the opinions about expecting more help, feedback, and guidance from the instructor.
	In IBT, sufficient time should be provided to students to complete their research.	Sufficient time	It includes the opinions such as sufficient time should be provided to carry out the activities.
Factors affecting inquiry-based teaching	Good communication and coordination among group members is required in group study in inquiry-based teaching process.	Communication, coordination, and efficiency	It covers the opinions such as communication and coordination are important in group studies and they affect the efficiency of the study.
	The negative attitude towards research also affects the process negatively.	Negative attitude and bias	It includes the opinions such as negative attitudes, thoughts and judgments towards the research affect the process negatively.
	The fact that students are not accustomed to the process of the method negatively affects the IBT process.	Being not accustomed to the process	It includes the statements of the PT that students are not accustomed to this method.
	Exam (score) concern affects the attitude towards ME course conducted	Exam(score) concern	It includes the opinions such as exam (score) concerns affect the attitude towards the

with IBT activities. The use of IBT activities in the ME course negatively affects the motivation for the course, as it is not oriented for KPSS and school exams.	KPSS motivation	course. Since the practices are not intended to prepare the candidates for the KPSS, the motivation of the prospective teachers is affected.
	IBT is a challenging process.	Challenging	It includes the ideas that the process is challenging.
	The IBT process may not increase interest towards the ME course.	Interest	It covers the ideas that the method will not increase the interest towards the course.
	The IBT process is a time-consuming and sometimes tiring process.	Time-consuming and tiring	It includes the ideas that the process is a time-consuming and sometimes tiring.
Negative aspects of inquiry-based teaching	The idea that students are not accustomed to this method and that they are responsible for their own learning can create anxiety in the process.	Anxiety	It includes the opinions of PT such as being not accustomed to this method and undertaking the responsibility of learning can sometimes cause anxiety in the process.
	Excessive workload in the IBT process negatively affects students' motivation.	Excessive workload	It covers the PT's views on the increase of workloads in the process.
	The use of IBT in the ME course suggests that it is difficult to prepare alternative ME instruments.	Difficult alternative	The views regarding the fact that preparing alternative ME instruments is difficult is evaluated within this framework.

The researcher and the expert independently analyzed the data in the context of the themes agreed upon. The intercoder reliability was calculated separately for each title and it was calculated by using the formula of Reliability = [Consensus/ (Consensus+ Disagreement)] * 100 proposed by Miles & Huberman (1994). The intercoder reliability values obtained for each title are given in Table 3.

Table 3

The intercoder reliability values

No	*Title*	*Number of themes agreed*	*Number of disagreed themes*	*Reliability value*
1	The benefits of inquiry-based teaching for the measurement and evaluation course	99	14	0.89
2	The benefits of inquiry-based teaching to gain skills	146	16	0.90
3	The benefits of inquiry-based teaching to getting ready for the profession	76	11	0.87
4	Characteristics of inquiry-based teaching process regarding individuals	180	31	0.85
5	Characteristics of the nature of the inquiry-based teaching process	125	19	0.87
6	Characteristics of the inquiry-based teaching process regarding the instructor	35	6	0.85
7	Factors affecting inquiry-based teaching	91	18	0.83
8	Negative aspects of inquiry-based teaching	79	11	0.88
	All themes covering all qualitative data	831	126	0.87

2 Findings

As a result of qualitative analysis of the prospective teachers' opinions about inquiry-based teaching, eight sub-topics are found. In this section, the findings related to each topic are presented separately. In addition, the frequency values of some codes in the analysis presented in this section are higher than the number of participants. At this point, the strategy of incorporating the same codes, which are repeated in different places in the opinions of the participants, into the frequency value was adopted with the common opinion of the expert, researcher and thesis supervisor involved in the data analysis and this approach was used in the analysis of the data.

2.1 The benefits of inquiry-based teaching for the measurement and evaluation course

The views of prospective teachers on the benefits of IBT to the ME course were examined under the codes of "permanency", "appropriate to real life" and

"raising awareness." Codes, frequency values for codes and sample participant opinions are given in Table 4.

Table 4

Benefits of IBT for the ME course

Theme	Codes	f	Participant Opinion Sample
The process carried out by IBT activities ensures permanent learning.	Permanency	50	It was more permanent because we did it in our own… (PT12)
Using IBT in the ME course provides an opportunity to see how information is applied in real life.	Appropriate to real life	35	… It was more appropriate to the real life but I don't what to do with KPSS now… (PT11)
The use of the IBT process in the ME course raises awareness of the importance of test development, exam preparation, question writing, and item analysis.	Awareness	28	In particular, test development, question preparation and question types were very helpful. Because we will prepare questions in the future… (PT6)

As seen in Table 4, permanency code, appropriateness to real life code and awareness code were repeated 50, 35 and 28 times, respectively in qualitative data.

2.2 The benefits of inquiry-based teaching to gain skills

Prospective teachers' opinions about the benefits of IBT to gain skills were examined under the codes of "research skills", "group study improves the students", "socialization", "problem-solving", "interpretation", "leadership and self-confidence", "extraordinariness", and "decision-making." Codes, frequency values for codes and sample prospective teachers' opinions are given in Table 5.

Table 5

The benefits of IBT to gain skills

Theme	Codes	f	Participant Opinion Sample
IBT develops research skills and enables them to be used in daily life.	Research skills	45	… Since we questioned many things we didn't know, researched, our research skills improved… (PT4)
In IBT, group study develops students in terms of developing friendship, self-expression, and peer	Group study improves the students	30	Of course, studying in groups has made improvements… (PT1)

learning.

IBT allows students to socialize.	Socialization	26	Frankly, I am not a social person; I developed myself in cooperation...I gained sociability… (PT4)
The IBT process improves problem-solving skills.	Problem-Solving	17	… Sometimes we encountered problems and solved them… (PT8)
The IBT process improves interpretation skills.	Interpretation	14	… Then, the report formats that you provided were not in a way that take this information and apply it on your paper, you rather demanded from us to make interpretations. I also improved my interpretation skills. (PT4)
Group study conducted in IBT improves leadership characteristics and self-confidence.	Leadership and self-confidence	11	… I led the group and I think it contributed to me. Its contribution to me is mostly in this direction, which gives me self-confidence… (PT7)
Students who are interested in different and extraordinary practices are not concerned about inquiry-based learning.	Extraordinariness	8	It was important to me that the course was extraordinary, and I wasn't worried, because, I thought that at least one course should be different. I wasn't concerned about the course… (PT10)
The IBT process improves individual and collective decision-making skills.	Decision-making	5	…There were discussions while studying in groups; many different ideas came out and we made decision on them. Everyone gave up their decisions one by one and made a joint decision… (PT12)

As seen in Table 5, the codes of research skills, group study improves the students, socialization, problem-solving, interpretation, leadership and self-confidence, extraordinariness and decision-making were repeated 45, 30, 26, 17, 14, 11, 8 and 5 times, respectively in qualitative data.

2.3 The benefits of inquiry-based teaching to getting ready for the profession
Prospective teachers' opinions about the benefits of IBT to prepare the prospective teachers to the profession were examined under the codes of "gaining experience", "professional motivation", and "misconception." Codes, frequency values for codes and sample prospective teachers' opinions are given in Table 6.

Table 6

The benefits of IBT to prepare the prospective teachers to the profession

Theme	Codes	f	Participant Opinion Sample
Using IBT in the ME course gives the teacher the opportunity to get to know the school environment. This is a good experience for prospective teachers before they start serving.	Gaining experience	49	… It contributed me, other than that, it was useful for us to gain experience by going to the schools. (PT9)
The use of the IBT process in the ME course motivates the teacher to the profession.	Professional motivation	34	Every time we went there, they asked questions like "Are you an intern?" We replied the question as "No." but we wanted to say yes. Now, I really want to be a teacher. (PT1)
The use of IBT in the ME course gives the prospective teacher the opportunity to identify students' misconceptions.	Misconception	4	In addition, children's misconceptions are revealed, and we noticed it… (PT1)

As seen in Table 6, the codes of gaining experience, professional motivation and misconception were repeated 49, 34 and 4 times, respectively in qualitative data.

2.4 Characteristics of inquiry-based teaching process regarding individuals
Prospective teachers' opinions about characteristics of IBT process regarding individuals were examined under the codes of "responsibility", "active students", "obtaining information", "out-of-class activity", "time", "making mistake" and "asking question." Codes, frequency values for codes and sample prospective teachers' opinions are given in Table 7.

Table 7

Characteristics of IBT process regarding individuals

Theme	Codes	f	Participant Opinion Sample
In the inquiry-based method, the student undertakes the responsibility of learning.	Responsibility	56	… In this way, we learned by investigating and questioning. I think that it could be better. (PT1)
The student must be active in the IBT process.	Active students	40	…The course became more effective with this method; we obtained a little more dynamic

			and active participation. (PT7)
In the IBT process, the individual should obtain the information from different sources and effectively.	Obtaining information	33	… We learned, but as I said, learning phase was so challenging that we searched on the internet, we looked up books, we made research and sometimes all these efforts were not enough. We consulted the teacher, sometimes we got stuck on the subjects…(PT2)
During the IBT process, the student also studies outside the class hours.	Out-of-class activity	33	… We can also come together outside the classroom and do activities by gathering the class; we should carry out collective activities. (PT7)
In IBT, the student should use time well.	Time	20	I think the time given was enough, but we are all students (laughs). As you know, we postpone our responsibilities to the last minute; that's why it was a little bit challenging for us... (PT1)
In the IBT process, the student can make mistakes until she/he reaches the correct information.	Making mistake	15	… After all, we learn better when we prepare it on our own. We made it correctly or we made mistakes and we corrected it by consulting to the professionals. (PT2)
In IBT, the individual enters into an intensive process of asking questions.	Asking question	14	… We do not know the subject comprehensively and we need to learn by making research and asking questions. …(PT3)

As seen in Table 7, the codes of responsibility, active students, obtaining information, out-of-class activity, time, making mistake and asking question were repeated 56, 40, 33, 20, 15 and 14 times, respectively in qualitative data.

2.5 Characteristics of the nature of the inquiry-based teaching process
Prospective teachers' opinions about characteristics of the nature of the IBT process were examined under the codes of "learning by doing-by experiencing", "unexpected challenges", "traditional-easy", "not applicable for every course", "KPSS", "compliance with the course." Codes, frequency values for codes and sample prospective teachers' opinions are given in Table 8.

Table 8

Characteristics of the nature of the IBT process

Theme	Codes	f	Participant Opinion Sample
In inquiry-based teaching, students learn by doing and experiencing.	Learning by doing- by experiencing	42	First, we learned by doing; Bloom's taxonomy, concept map, grid are really applied in practice… (PT1)
Unexpected challenges may occur during the IBT process.	Unexpected challenges	39	So we went to schools. Some schools didn't allow us to make an exam. The teachers there asked us strange questions like "Why do you have to make an exam? How can we be sure that you are students?" (PT2)
Traditional teaching is easier than inquiry-based teaching.	Traditional-easy	20	It is still easier for us to listen to the topics directly from the instructor. We can just sit there and listen to the instructor, even if we will forget afterwards (laughs). (PT1)
The IBT method is not applicable for every course.	Not applicable for every course	12	It varies depending on the course. It is quite appropriate to the ME course, but we are studying at the department of elementary mathematics teaching and applying it to the math courses is very unreasonable. (PT 3)
The use of IBT activities in the ME course is not intended to prepare the prospective teachers for the KPSS (Public Personnel Selection Examination).	KPSS	12	… So, if we didn't have to take the KPSS, this would be ideal. Since we had to take an exam like KPSS, our aim was to lecture the subject and solve the questions about KPSS and our expectations were not met. (PT7)
The IBT method is more appropriate to the Educational Sciences Courses.	Compliance with the course	9	I do not want to apply it to all courses, but maybe I can apply it in some educational science courses. (PT2)

As seen in Table 8, the codes of learning by doing-by experiencing, unexpected challenges, traditional-easy, not applicable for every course, KPSS, compliance with the course were repeated 42, 39, 20, 12, 12 and 9 times, respectively in the qualitative data.

2.6 Characteristics of the inquiry-based teaching process regarding the instructor

Prospective teachers' opinions about characteristics of the IBT process regarding the instructor were examined under the codes of "guidance and feedback" and "sufficient time." Codes, frequency values for codes and sample prospective teachers' opinions are given in Table 9.

Table 9

Characteristics of the IBT process regarding the instructor

Theme	Codes	f	Participant Opinion Sample
More guidance and feedback should be given to students for inquiry-based teaching.	Guidance and feedback	25	It is better if the teacher of the course gives preliminary information at the beginning; we can make research afterwards and it can be more effective in this way. (PT1)
In inquiry-based teaching, students should be given sufficient time to complete their research.	Sufficient time	16	Time and duration were enough. I like the flexible working hours. The group members were already my friends and we didn't have a problem. (PT10)

As seen in Table 9, the codes of guidance and feedback and sufficient time were repeated 25 and 16 times, respectively in qualitative data.

2.7 Factors affecting inquiry-based teaching

Prospective teachers' opinions about the factors affecting inquiry-based teaching were examined under the codes of "communication, coordination, and efficiency", "negative attitude and bias", "being not accustomed to the process", "exam (score) concern", and "KPSS motivation." Codes, frequency values for codes and sample prospective teachers' opinions are given in Table 10.

Table 10

Factors affecting inquiry-based teaching

Theme	Codes	f	Participant Opinion Sample
Good communication and coordination among group members is required in group study in the inquiry based teaching process.	Communication, coordination, and efficiency	32	… There were friends in the group who did not know how to use them, there was a miscommunication. We couldn't explain it to them; they couldn't manage it. (PT7)
The negative attitude towards research also	Negative attitude and bias	29	The person must be interested and needs to be curious in this

affects the process negatively.			regard. It is a personal skill. We were not very successful at this point. (PT7)
The fact that students are not accustomed to the process negatively affects the IBT process.	Being not accustomed to the process	19	…We didn't do these things in elementary school, middle school and high school; we are not accustomed to do this…(PT1)
Exam (score) concern affects the attitude towards ME course conducted with IBT activities.	Exam (score) concern	16	… Our thoughts and feelings could have been more positive if we had not had any exam (score) concerns. (PT7)
The use of IBT activities in the ME course negatively affects the motivation for the course, as it is not oriented for KPSS and school exams.	KPSS motivation	13	…When I studied on the KPSS books, I found out that these were not appropriate to KPSS…(PT6)

As seen in Table 10, the codes of communication, coordination, and efficiency, negative attitude and bias, being not accustomed to the process, exam (score) concern and KPSS motivation were repeated 32, 29, 19, 16 and 13 times, respectively in qualitative data.

2.8 Negative aspects of inquiry-based teaching

Prospective teachers' opinions about negative aspects of inquiry-based teaching were examined under the codes of "challenging", "interest", "time-consuming and tiring", "anxiety", "excessive workload", "difficult alternative." Codes, frequency values for codes and sample prospective teachers' opinions are given in Table 11.

Table 11

Negative aspects of inquiry-based teaching

Theme	*Codes*	*f*	*Participant Opinion Sample*
IBT is a challenging process.	Challenging	24	…In the usual method, the teacher would tell us, and we would take notes. Then we would study and pass the exam. The other method is difficult because we're not used to it… (PT11)
The IBT process may not increase interest towards the ME course.	Interest	17	Frankly, this method did not increase my interest in the course. (PT6)

The IBT process is a time-consuming and sometimes tiring process.	Time-consuming and tiring	15	… It is quite difficult to conduct continuous research during a semester, ask, examine, study with the group, share what you have learned with the group, ask questions, answer the questions that you have asked. It is permanent but challenging and time-consuming at the same time. (PT1)
The idea that students are not accustomed to this method and that they are responsible for their own learning can create anxiety in the process.	Anxiety	14	We felt anxious; I had difficulty in doing it. Information was not provided to us directly, so we conduct studies to get the information. (PT5)
Excessive workload in the IBT process negatively affects students' motivation.	Excessive workload	13	… Because we had to spend time outside of class; we woke up early to go to school, it definitely increased our workload. (PT9)
The use of IBT in the ME course suggests that it is difficult to prepare alternative ME instruments.	Alternative is Difficult	7	… It was quite difficult to prepare alternative measurement and evaluation instruments, and I don't think I would use them frequently… (PT5)

As seen in Table 11, the codes of challenging, interest, time-consuming and tiring, anxiety, excessive workload, difficult alternative were repeated 24, 17, 15, 14, 13 and 7 times, respectively in qualitative data.

3   Discussion

Prospective teachers' opinions about inquiry-based teaching process were examined under titles, themes and related codes. In this section, the findings related to each theme were examined within the framework of the relevant literature. Accordingly, there are three themes within the scope of the benefits of inquiry-based teaching to the measurement and evaluation course. These include that inquiry-based learning provides permanent learning, and that the use of IBT in the ME course provides an opportunity to observe how the subjects are applied in real life and that the IBT process raises awareness of the importance of the content of the ME course. Similarly, in another study, it is stated that inquiry-based learning is effective in ensuring the permanency of what is learned (Çalışkan & Turan, 2008). In another study, in which the effect of activities build upon inquiry-based learning was examined, it was specified that this process increased students' knowledge of subject content and learning permanency (Vilardi, 2013). It has been pointed out in different studies that IBT

is in line with the real life (Hammer, 1997; Şensoy, 2009). Şensoy (2009) states that IBT is a useful method to prepare prospective teachers for professional life. It is also emphasized that this method provides prospective teachers with professional awareness (Leonhardt, 1998; Madill et al., 2001).

There are eight themes under the title of the benefits of inquiry-based teaching in gaining skills. The first one is that IBT develops research skills and enables them to be used in daily life. Consistent with this finding of the study, it has been reported that inquiry-based learning provides individuals with research skills (Tatar & Kuru, 2006; Yore, 1984). Another theme is the view that group studies in IBT develop prospective teachers in terms of friendship, self-expression, and peer learning. It is mentioned that group study activities are very important for the social development of the students (Açıkgöz, 2007; Çalışkan, 2008). Another theme includes the prospective teachers' opinion on the fact that IBT helps them to socialize. In this context, one of the prospective teachers expressed her/his opinion as *"Frankly, I am not a social person; I developed myself in cooperation... I gained sociability (PT4)."* It is specified that friendship relations are developed in group studies which are included in the scope of cooperative learning (Lazarowitz et al., 1994). Two of the other themes under this title are prospective teachers' views explaining that the IBT process improves their problem-solving and interpretation skills. In parallel with this finding, the other studies also state the fact that inquiry-based learning improves students' problem-solving (Büyükkaragöz & Çivi, 1999; Açıkgöz, 2007) and interpretation skills (Soylu, 2004; Wyatt, 2005). Another theme includes the prospective teachers' views that this process improves leadership characteristics and self-confidence. Similar results to this finding are asserted in the studies of Fansa (2012), Tatar and Kuru (2006). In another theme under this title, prospective teachers expressed that students interested in different and extraordinary practices will not be concerned about inquiry-based learning. In this context, it is pointed out that the inquiry-based learning process should start with interesting questions (Sakar, 2010) and that it is also important that the inquiry-based learning environment should be designed in an interesting manner (Keller, 2001). Another theme is that the IBT process improves individual and collective decision-making skills. In this context, a prospective teacher explained her/his opinion as *"...There were discussions while studying in groups; many different ideas came out and we made decision on them. Everyone gave up their decisions one by one and made a joint decision ... (PT12)."*

There are three themes under the title of the benefits of IBT for preparing for the profession. According to this, prospective teachers reported that the lecturing ME course with inquiry-based teaching activities provided them with the opportunity to get to know the school environment, gain professional experience before the service and motivate them for the profession. Çalışkan (2008) states that the educational activities that students experience during the IBT process are a good experience for them. Şensoy (2009) emphasizes that IBT is effective in

creating and increasing professional motivation for the prospective teachers. In the activities carried out within the scope of this study, prospective teachers participated in lessons from time to time in schools and stated that they realized students' misconceptions during this process. It is stated that inquiry-based learning activities are effective in reducing misconceptions (Kula, 2009).

There are seven themes under the title of characteristics of IBT process regarding individuals. The first is that the student has the responsibility of learning during the IBT process. These views of prospective teachers are consistent with the characteristics expressed in various studies (Açıkgöz, 2007; Akpullukçu, 2011; Massa, 2008; Tatar & Kuru, 2006) as "In the IBT process, students undertake the responsibility of learning; they create their own learning and the aim of it is to raise the students as individuals who can learn independently."

Another theme is the views expressed by the prospective teachers that they are active in this process. The views of prospective teachers are required as it is the nature of this method and in the studies conducted by Manlove et al. (2006) and Tatar and Kuru (2006), they also mention the necessity of the students' active participation in this process. Another theme that arises from the views of prospective teachers is to access information from different sources in this process. In various studies (Açıkgöz, 2007; Çalışkan, 2008; Sungur & Tekkaya, 2006; Wyatt, 2005; Yore, 1984), it is pointed out that the IBT process and its activities require the search of information from different sources. In another theme, prospective teachers state that the IBT process includes extracurricular activities. Inquiry-based learning should not be limited to school and class hours. Educational situations can be organized to include real-life environments and learning can take place outside the classroom (Alp et al., 2006; Knapp & Barrie, 2001). It is even reported that students can learn better through extracurricular activities (Klemmer, Waliczek, & Zalicek, 2005). Another theme under this title is the prospective teachers' views that time should be used well in the IBT process. IBT is time consuming and therefore, the students should be given sufficient time (Carin & Bass, 2001). It can be said that the IBT process provides students to improve their skills in planning and using time effectively. In another theme, prospective teachers reported that they made mistakes until they reached the right information in the process. According to Üstündağ (2005), making mistakes and overcoming this mistake is an important skill. Karasar (2005) emphasizes that an individual's current misinformation leads her/him to do research. In the inquiry-based learning process, when students make mistakes, teachers should direct the students to the research rather than giving the correct information directly, so that they can access the correct information on their own (Carin & Bass, 2001). The last theme listed under this title is that prospective teachers engage in an intensive process of asking questions in IBT. It is a characteristic feature of this approach and the inquiry-based teaching process

often introduces with an interesting question or questions (Koç, 2006; Wyatt, 2005).

There are six themes under the title of characteristics related to the nature of the inquiry-based learning process. The first of these is the prospective teachers' thoughts about learning by doing-experiencing in the process. In this process, the subjects of the measurement and evaluation course are organized in a way that will enable prospective teachers to learn by doing and experiencing. Students learned how to develop tests, prepare questions, and apply alternative measurement and evaluation instruments. In the control group, these subjects were taught theoretically and with the method of direct instruction. This is understood from the statement *("First we learned by doing; Bloom's taxonomy, concept map, grid are really applied in practice ... (PT1)")* of one of the prospective teachers. Another theme under this title is that prospective teachers encounter unexpected challenges in this process. According to Frankel and Wallen (2006), it is very natural for the researcher to encounter challenges in the research process. One of the themes listed under this title covers the prospective teachers' comparison of traditional teaching with IBT and their views stating that the traditional method is easier. In another doctorate study, it is mentioned that students perceive traditional teaching as easier than IBT (Parim, 2009). In another study, Benson (1998) studied IBT with the group of prospective teachers and emphasized that during the process, prospective teachers had difficulty in the process because they were accustomed to the traditional method but they got used to the method over time. Another theme under this heading is the participants' views that this method is not applicable for all courses. The prospective teachers stated that inquiry-based learning was appropriate for educational science courses and especially for the ME course, but they did not consider it as appropriate for their teaching areas, mathematics. At this point, almost the majority of prospective teachers stated that mathematics courses couldn't be taught with this method. They pointed out that mathematics is an abstract field and so the courses in this field should be lectured directly to them. It is stated that the learning outcomes of each course cannot be attained with the understanding of constructivism that this approach is not appropriate for the courses in which basic information is given, but that this approach may be appropriate for the courses in which high-level thinking and concepts are aimed to be learned in depth (Hoagland, 2000). Again under this topic, the prospective teachers asserted that teaching the measurement and evaluation course by inquiry oriented teaching activities was not directed towards KPSS and that KPSS was predominantly based on questions containing rote information, so they had to memorize the subjects down to the last detail, that KPSS posed an obstacle for them, that they had to pass this test in order to become teachers whether they want or not. Similar results are expressed in different studies (Sezgin & Duran, 2011; Şahin-Taşkın & Hacıömeroğlu, 2010). Sezgin and Duran (2011) state that prospective teachers' approaches of focusing on what to

be asked in KPSS rather than their professional contributions to the courses in the undergraduate curriculum are grave. KPSS is a test in Turkey for prospective teachers where they should get enough points to be appointed as teachers after graduation. The participants of this study are 3rd grade prospective teachers and they will take the KPSS exam after graduation. It is understood that KPSS affects them and their motivation. Similar results are available in many studies related to the KPSS exam in the relevant literature (Akkuş, 2014; Baştürk, 2007).

There are two themes under the title of IBT process for the instructor. The first is the prospective teachers' views that they expect more feedback from the instructor. In the IBT process carried out within the scope of this study, students were given timely, in-class and out-of-class feedback about each activity, but this may not have been sufficient for some students. In the inquiry-based science course conducted with prospective teachers, it is stated that the students are in constant need of approval about the task performed, and they continuously asked questions to the instructor about whether they perform the tasks correctly or not (Kazempour & Amirshokoohi, 2013). The reasons for the ineffectiveness of IBT are stated that in cases where the students who are accustomed to the traditional method are too much set free, inadequate guidance and inadequate feedback (Parim, 2009). The source of these ideas of teacher trainees may be related to situations, such as their not being used to this method, or that they are not independent, self-learning individuals. Another theme under this topic is towards allowing sufficient time for research and activities. They stated that the time was sufficient in the interviews, because they did not perform their duties and responsibilities in a timely manner, they had problems from time to time due to their own mistakes, they liked the flexible time periods, they reported this situation to the instructor easily when they had time problems and they received positive feedbacks. A prospective teacher said *"I think the time given was enough, but we are all students (laughs). As you know, we postpone our responsibilities to the last minute; that's why it was a little bit challenging for us... Even if you give us 2 months, we will try to finish it in the last 3-5 days, so I think there are problems caused by us. In other words, the time was sufficient [PT 1]."* Another student expressed her/his opinion, as *"Time and duration were enough. I like the flexible working hours. The group members were already my friends and we didn't have a problem [PT].*" Some prospective teachers may think that the time given is not sufficient due to their studying habits.

Five themes have emerged under the topic of factors affecting inquiry-based learning. The first is that good communication and coordination among group members is necessary in group work during IBT. In addition, prospective teachers stated that this situation affects the efficiency of the studies. Cooperation occurs in the IBT process (Hammerman, 2006). Another theme under this title is that negative attitudes and prejudice towards research affect the process. It is stated that students may have resistance to the research and

therefore, students should be familiarized with this method starting from elementary school (Çalışkan, 2008). It is understandable that some of the students who experienced the IBT process may have different attitudes regarding the activities related to research and completing the process. A student's statement is meaningful in this regard: *"Self-learning gives us a lot but it is also very difficult. We did not do such things in primary, middle and high school; we are not used to it. You do everything yourself, constantly research, ask, examine, work with the group, tell the group what you have learned, ask questions, answer the questions that you have asked. It is permanent but challenging and time-consuming at the same time. Sometimes you get nervous asking 'why do I have to do this?' The other group (control) doesn't do anything, they just listen and go. Our friends are traveling and having fun, while we are visiting the schools, consulting with the teachers at the university, and going to the library and reading articles. But it's permanent. [PT1]."* Regarding this topic, prospective teachers considered not being accustomed to this method as one of the factors negatively affecting the inquiry-based learning process. Although there are many benefits of IBT in the literature, it is determined that teachers do not use this method very often (Welch et al., 1981). Considering the constructivist primary education programs have been in practice since the 2005-2006 academic year in Turkey, it can be said that this situation is also valid for our country. It is inevitable that students who take courses with traditional methods since primary education and who are familiar with traditional methods bring some habits along with them. Changing habits is difficult (Constenson & Lawson, 1986) and time consuming. It is possible that these habits will adversely affect the inquiry-based learning process. Again, in this topic, within the framework of another theme, prospective teachers have opinions that grade concerns may affect their attitudes towards the ME course. It is stated that exam-oriented learners may think that they learn less with this method (Çalışkan, 2008) and this situation may affect the attitude towards the course. One of the prospective teachers thinks that *"Ultimately, we had an exam (score) concern. Our thoughts and feelings could have been more positive, if we had not had any exam (score) concerns [PT7]."* Finally, under this topic, prospective teachers stated that the use of IBT activities in the ME course negatively affected their motivation for the ME course as it was not directed to KPSS and other exams in the school. These findings obtained from the analysis of the interviews with prospective teachers indicate that factors such as grades and KPSS anxiety negatively affect the attitudes of prospective teachers towards the ME course. Baştürk (2007) stated that KPSS increased the anxiety of prospective teachers in his study. In addition, Akkus (2014) revealed that prospective teachers think that teaching lessons with non-traditional methods has little contribution to KPSS. Also, the test anxiety experienced by prospective teachers may affect their tendency to perspective-taking in the future (Wolgast et al., 2020).

There are six themes under the topic of negative aspects of inquiry-based learning. The first is that prospective teachers perceive inquiry-based learning as a difficult process. According to Constenson and Lawson (1986), the IBT process is not easy. In another study, regarding inquiry-oriented learning, it was established that prospective teachers think that this method can have disadvantages, such as time, physical conditions, teacher preparation, inapplicability to all subjects and crowded classes, and therefore they develop negative attitudes and understandings against the method (Bayır & Köseoğlu, 2013). Another theme is the students' views that this method may not increase interest in the ME course. During the IBT process, students' interests may decrease from time to time (Constenson & Lawson, 1986). It is thought that the source of these thoughts of prospective teachers could be different factors, such as difficulties experienced during the process, unexpected situations, problems in group works, increase in workloads, habits, and students' perception towards practices as time consuming and exhausting. Within the scope of another theme, prospective teachers think that IBT process is time consuming and tiring. It is stated that there may be insufficient time during IBT process (Hurd et al., 1980). A prospective teacher expressed her opinions in such a way that *"Obviously I wouldn't want it for every course. Because it was a very tiring process for me. The workload has increased. If it was only one course and we did these activities, it would be okay. We would do it very comfortably, but we also have other courses. This semester many courses overlapped, so, we are very tired... [PT4]."* Another prospective teacher expressed his/her thoughts related to the process: *"There was pros and cons. Pros were that I was leading the group, and I think it contributed to me. It gave me self-confidence. Apart from that, I learned the methods that I would really apply in my future education life. I learned to look at things from different perspectives. The cons are that it is strenuous, our workload has increased, we had to do the tasks, assignments at home that we could not finish at school and took the lessons home. For example, we prepared an exam. We have never prepared an exam so far, and we didn't know how to do it. We searched from many sources, books, looked at reliability and validity, and it was very time consuming. Workload increased, the labor increased [PT7]."*

In another theme under the last topic, prospective teachers have opinions that they are not used to this method and that the idea of being responsible for their own learning creates anxiety in the process. In this context, it was pointed out that because of the negative attitude of some students, such as anxiety and boredom, IBT process can be unnerving for them and that these students should be supported (Institute for Inquiry, 1995). In the experimental process of this study, prospective teachers were given necessary information about the method, they were directed, but it might not have been enough for some students. The fact that prospective teachers think that their workload increases in IBT method is another matter that they consider negatively. Similarly, in a qualitative study

investigating the views of students and instructors about the problem-based learning process, it was reported that the social life of the students was limited due to the very intensive hours, and this situation caused the students to exhibit negative attitudes towards problem-based learning especially at the beginning of the process (Biber & Başer, 2012). In the same study, it is stated that the exams carried out in the process create weariness and reluctance in students and this situation decreases the efficiency of the process. Dochy et al. (2003) argues that the effectiveness of problem-based learning is discussed, but when positive effects are considered, negative results tend to be ignored. The other view of the prospective teachers under the topic of the negative aspects of IBT is that it is difficult to prepare alternative measurement and evaluation tools. It is stated that in some of the different studies conducted on alternative measurement and evaluation, teachers in some and prospective teachers in other studies do not prefer to use these tools and they may have different reasons. Some of these reasons are that it is difficult and time-consuming to prepare these tools, it is costly, it increases teachers' workload and teachers do not have enough information on this issue (Akbaş & Gençtürk, 2013; Kuran & Kanatlı, 2009; Özenç, 2013; Sağlam-Arslan et al., 2008). Prospective teachers' opinions that it is difficult to prepare alternative measurement and evaluation tools are coherent with the studies in the literature, but the reason may not be related only to the method applied. As stated by Parim (2009), the habits of prospective teachers that they bring along from the traditional method and their resistance to change can be seen among the reasons of this situation. In addition, it may emanate from the fact that the prospective teachers themselves may not have had much experience with alternative measurement and evaluation tools. Since standard tests and exams are more widely used in the education system of Turkey.

Conclusion

In this study, the course process carried out with inquiry-based teaching practices was examined within the framework of the opinions of prospective mathematics teachers. The measurement and evaluation course, which is one of the teaching undergraduate courses, was conducted within the scope of the inquiry-based teaching process and the opinions of the participants about this process were investigated. The opinions of the participants were gathered under the headings of the benefits of inquiry-based teaching for the measurement and evaluation course, the benefits of inquiry-based teaching to gain skills, the benefits of inquiry-based teaching to getting ready for the profession and the characteristics of inquiry-based teaching process regarding individuals. Furthermore, the opinions of the participants related to the headings of the characteristics of the nature of the inquiry-based teaching process, the characteristics of the inquiry-based teaching process regarding the instructor, the factors affecting inquiry-based teaching and negative aspects of inquiry-based teaching were included.

Prospective teachers stated that this process provides permanent and meaningful learning, provides the opportunity to apply the lessons learned in the real life, and develops some skills such as research, problem solving, decision making, leadership. It was stated that the activities carried out during the course give prospective teachers the opportunity to get to know the real school environment and obtain professional experience. Prospective teachers stated that they had the responsibility of learning about the inquiry-based teaching process, in this way, they were active in the process and experienced an intense questioning process. They stated that they learned by doing and experiencing in the inquiry-based teaching process and reported that traditional teaching was easier than the inquiry-based teaching process. The opinion that extra-curricular activities in the process were time consuming was shared by some participants. Preservice teachers stated that inquiry-based teaching method is not suitable for all subjects, it is not particularly suitable for mathematics, but it is very suitable for educational sciences courses, especially the measurement and evaluation course. Some participants think that the instructor should give more feedback and guidance during the inquiry-based teaching process and the time given for the activities should be sufficient. Prospective teachers stated that problems such as negative attitude and bias towards research, being not accustomed to the process, exam (score) concern, lecturing the course with this method is not appropriate to KPSS negatively affect the inquiry-based teaching process. The participants stated that the inquiry-based teaching process is challenging, time consuming, tiring, increasing the workload and occasionally causing anxiety in the process. It can be said that most of the participants have positive opinions about the inquiry-based teaching process.

We live in the information age, and therefore, it is very important for each individual to grow up as individuals who can obtain information, research, question, solve problems, think critically, creatively and productively. Teachers have a great responsibility in providing these skills and features to individuals. It is particularly important that teachers acquire these skills first. However, it is not always possible to obtain these skills and features with traditional teaching understanding. Therefore, it is necessary to use modern learning-teaching approaches in teacher education. One of them is the inquiry-based learning-teaching approach. In this study, prospective teachers stated that the course taught with this method contributed significantly to the process. There is another important benefit of using contemporary learning approaches in teacher education. In the renewed primary, secondary and high school curriculum, traditional teaching understanding has been eliminated in Turkey and student-centered, different contemporary teaching and learning methods have been adopted. On the other hand, it can be said that teacher education is mostly carried out with traditional understanding and methods. It will be very beneficial for prospective teachers to experience the approaches and methods that they will apply in their professional lives before starting the profession. In this context, it

can be suggested to use both the inquiry-based learning-teaching approach that is the subject of this study and other learner-centered approaches in teacher education. Furthermore, the applicability of inquiry-based teaching in other educational sciences courses other than the measurement and evaluation course can be researched. In order to develop students' research awareness and competencies and to decrease their research anxiety, this method can be applied from primary school level and students can get used to inquiry-based learning method. It should be taken into consideration that deep-rooted beliefs and habits of students obtained from previous educational experiences make it difficult to apply this model. Studies evaluating the effect of this method at undergraduate or graduate levels, especially in abstract fields such as mathematics and in different courses can be conducted.

References

Açıkgöz, K. Ü. (2007). *Aktif öğrenme* (9th ed.). İzmir: Biliş Publications.

Akbaş, Y., & Gençtürk, E. (2013). Geography teachers' views about alternative assessment and evaluation techniques: Usage levels problems and limitations. *Atatürk University Eastern Geographical Review*, *18*(30), 331-356.

Akınoğlu, O. (2004). Yapılandırmacı öğrenme ve coğrafya öğretimi. *International Journal of Geography and Geography Education*, *10*, 73-94.

Akkuş, Z. (2014). Views of pre-service teachers of social studies about the assessment and evaluation activities based on constructive approach. *Selçuk University Journal of Institute of Social Sciences*, *31*, 13-27.

Akpullukçu, S. (2011). *The Effect of Inquiry-Based Learning Environment in Science and Technology Course on the Students' Academic Achievements, Attitudes and Retention Level* (unpublished Master thesis). İzmir, Turkey: Dokuz Eylül University.

Alkan-Dilbaz, G., Yanpar-Yelken, T., & Özgelen, S. (2013). The effects of research-based learning on primary school students. *Fırat University Journal of Social Science*, *23*(1), 89-103.

Alp, E., Ertepınar, H., Tekkaya, C., & Yılmaz, A. (2006). İlköğretim öğrencilerinin çevreye yönelik tutum ve bilgileri üzerine bir çalışma. In *The 7th National Science and Mathematics Education Congress Abstracts Book*. Ankara: Palme Publications.

Baştürk, R. (2007). Investigation of test anxiety levels of pre-service teachers taking civil servant selection examination. *Fırat University Journal of Social Science*, *17*(2), 163-176.

Bayır, E., & Köseoğlu, F. (2013). Getting pre-service chemistry teachers to construct understanding about inquiry-based teaching. *Asya Journal of Instruction*, *1*(2), 29-43.

Benson, J. (1998). Using an inquiry approach with preservice teachers to explain the process of facts, concept, and generalization. *The Social Studies*, *89*(5), 227-231.

Biber, M., & Başer, N. (2012). Probleme dayalı öğrenme sürecine yönelik nitel bir değerlendirme. *HAYEF: Journal of Education*, *17*, 12-33.

Bostan-Sarıoğlan, A., Can, Y., & Gedik, İ. (2016). The assessment of the suitability of the activities in 6th grade science course books for inquiry based learning approach. *Abant İzzet Baysal University Journal of Faculty of Education*, *16*(3), 1004-1025.

Büyükkaragöz, S., & Çivi, C. (1999). *Genel öğretim metotları öğretimde planlama uygulama* (10th ed.). İstanbul: Beta Publications.

Carin, A. A., & Bass, J. E. (2001). *Teaching Science as Inquiry*. New Jersey: Prentice-Hall, Inc., Upper Saddle River.

Chang, C., Chang, C.-K., & Shih, J.-L. (2016). Motivational strategies in a mobile inquiry-based language learning setting. *System*, *59*, 100-115.

Constenson, K., & Lawson, A. (1986). Why isn't inquiry used in more classrooms? *The American Biology Teacher*, *48*(3), 150-158.

Creswell, J. W. (2013). *Research Design Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). California: Sage Publications, Inc.

Çalışkan, H. (2008). *The Effect of Inquiry-Based Learning Approaches in 7th Grade Social Studies Course in Primary School on Attitude Towards Course, Academic Achievement and the Degrees of Retention* (unpublished Doctoral thesis). Ankara, Turkey: Gazi University.

Çalışkan, H., & Turan, R. (2008). The effect of inquiry-based learning approaches in social studies course on academic achievement and the degrees of retention. *The Journal of Turkish Educational Sciences*, *6*(4), 603-627.

Dochy, F., Segers, M., Van den Bossche, P., & Gijbels, D. (2003). Effects of problem-based learning: A meta-analysis. *Learning and Instruction*, *13*(5), 533-568.

Duran, M., & Dökme, İ. (2018). The Effect of inquiry-based learning approach on conceptual understanding level and some learning outcomes. *Trakya Journal of Education*, *8*(3), 545-563.

Ekiz, D. (2009). *Bilimsel Araştırma Yöntemleri* (2nd ed.). Ankara: Anı Publications.

Fansa, M. (2012). *The Effect of Inquiry-Based Learning Approaches in the Education of Science in Primary School on the Science Process Skills, Academic Achievement and Attitude* (unpublished Master thesis). Hatay, Turkey: Mustafa Kemal University.

Fraenkel, J. R., & Wallen, N. E. (2006). *How to Design and Evaluate Research in Education* (6th Ed.). New York: Mac Graw Hill, Inc.

Hammer, D. (1997). Discovery learning and discovery teaching. *Cognition and Instruction*, *15*(4), 485-529.

Hammerman, E. (2006). *8 Essentials of Inquiry-Based Science, K-8*. California: Corwin Press.

Heindl, M. (2019). Inquiry-based learning and the pre-requisite for its use in science at school: A meta-analysis. *Journal of Pedagogical Research*, *3*(2), 52-61.

Hoagland, M. A. (2000). *Utilizing Constructivism in the History Classroom.* Retrieved from http://files.eric.ed.gov/fulltext/ED482436.psd

Hurd, P. D., Bybee, R. W., Kahle, J. B., & Yager, R. E. (1980). Biology education in secondary schools of the United States. *The American Biology Teacher*, *42*(7), 388-404.

Hwang, G.-J., Chiu, L.-Y., & Chen, C.-H. (2015). A contextual game-based learning approach to improving students' inquiry-based learning performance in social studies courses. *Computers & Education*, *81*, 13-25.

Instıtute for Inquiry. (1995). *Inquiry Based Science: What Does It Look Like?* Retrieved from http://www.exploratorium.edu/IFI/resources/classroom/ inquiry_based.html

Karasar, N. (2005). *Bilimsel araştırma yöntemleri*. Ankara: Nobel Publications.

Kazempour, M., & Amirshokoohi, A. (2013). Exploring elementary pre-service teachers' experiences and learning outcomes in a revised inquiry-based science lesson: an action research. *Journal of Education and Learning*, *2*(2), 144-154.

Keller, T. J. (2001). *From Theory to Practice Creating an Inquiry-Based Science Classroom* (unpublished Master thesis). Lutheran University.

Klemmer, C. D., Waliczek, T. M. & Zajicek, J. M. (2005). Growing minds: The effect of a school gardening program on the science achievement of elementary students. *HortTechnology*, *15*(3), 448-452.

Koç, G. (2006). Teacher-learner roles and interaction systems in constructivist classrooms. *Education and Science*, *31*(142), 56-64.

Knapp, D., & Barrie, E. (2001). Content evaluation of an environmental science field trip. *Journal of Science Education and Technology*, *10*(4), 351-357.

Kula, Ş. G. (2009). *The Effect of Inquiry-Based Science Learning on the Students' Science Process Skills, Achievement, Concept Learning and Attitude* (unpublished Master thesis). İstanbul, Turkey: Marmara University.

Kuran, K., & Kanatlı, F. (2009). The evaluation of classroom teachers' opinions on the alternative assessments techniques. *Mustafa Kemal University Journal of Social Sciences Institute*, *6*(12), 209-234.

Lazarowitz, R., Hertz-Lazarowitz, R., & Baird, H. (1994). Learning science in a cooperative setting: academic achievement and affective outcomes. *Journal of Research in Science Teaching*, *31*(10), 1121-1131.

Leonhardt, A. N. (1998). An ecological system curriculum: an integrated MST approach to environmental science education. *The Annual Meeting of the*

International Consortium for Research in Science and Mathematics Education. Trinidad: Port of Spain.

Madill, H. M., Amort-Larson, G., Wilson, S. A., Brintnell, S. G., Taylor, E., & Esmail, S. (2001). Inquiry-based learning: An instructional alternative for occupational therapy education. *Occupational Therapy International*, *8*(3), 198-209.

Manlove, S., Lazonder, A. W., & De Jong, T. (2006). Regulative support for collaborative scientific inquiry learning. *Journal of Computer Assisted Learning*, *22*, 87-98.

Massa, N. M. (2008). Problem-based learning (PBL): A real-world antidote to the standards and testing regime. *New England Journal of Higher Education*, *22*(4), 19-20.

MNE. (2018). *Science Course Curriculum (Primary and secondary school 3, 4, 5, 6, 7 and 8. classes).* Retrieved from http://mufredat.meb.gov.tr/ProgramDetay.aspx?PID=325

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage.

Özenç, M. (2013). Determination of levels of primary school teachers' alternative assessment and evaluation knowledge. *Dicle University Ziya Gökalp Journal of Education*, *21*, 157-178.

Parim, G. (2009). *The Effects of Inquiry on the Concept Learning, Achievement and Development of Scientific Process Skills of 8th Grade Students as Related to Photosynthesis and Respiration* (unpublished Doctoral thesis). İstanbul, Turkey: Marmara University.

Saban, A. (2009). Content analysis of Turkish studies about the multiple intelligences theory. *Educational Sciences: Theory & Practice, 9*(2), 833-876.

Sağlam-Arslan, A., Avcı, N., & İyibil, G. (2008). Physics prospective teachers' perception levels concerning alternative evaluations methods. *Dicle University Ziya Gökalp Journal of Education*, *11*, 115-128.

Sakar, Ç. (2010). *The Effect of Inquiry Based Chemistry Teaching on Student's Academic Achievement and Attitude* (unpublished Master thesis). Konya, Turkey: Selçuk University.

Sezgin, F., & Duran, E. (2011). The reflections of the public personnel selection examination on teacher candidates' academic and social lives. *Turkish Journal of Social Research*, *153*, 9-22.

Soylu, H. (2004). *Fen Öğretiminde yeni yaklaşımlar: Keşif yoluyla öğrenme.* Ankara: Nobel Publications.

Stacey, G., Wilson, C., Reddy, H., Palmer, C., Henderson, J., Little, H., & Bull, H. (2018). Diagnosing and treating enquiry based learning fatigue in graduate entry nursing students. *Nurse Education in Practice*, *28*, 310-313.

Sungur, S., & Tekkaya, C. (2006). Effects of problem-based learning and traditional instruction on self-regulated learning. *The Journal of Educational Research*, *99*(5), 307-320.

Şahin-Taşkın, Ç., & Hacıömeroğlu, G. (2010). Importance of pedagogy courses on preservice teachers' professional development. *Pamukkale University Journal of Education*, *28*, 165-174.

Şensoy, Ö. (2009*). The Effect of Inquiry-Based Science Instruction According to the Constructivist Approach on Preservice Teachers' Problem Solving Skills, Self-Efficacy and Achievements* (unpublished Doctoral thesis). Ankara, Turkey: Gazi University.

Tatar, N., & Kuru, M. (2006). The effect of inquiry-based learning approach in science education on academic achievement. *Hacettepe University Journal of Education*, *31*, 147-158.

Üstündağ, T. (2005). *Journey to the Creativeness*. Ankara: PegemA Publications.

Vilardi, V. A. (2013). *An Examination of the Influence of Inquiry-Based Laboratory Activities and Success on Standards Based Achievement Tests in a Suburban High School* (unpublished Doctoral thesis). Alabama: Alabama University.

Welch, W. W., Klopfer, L. E., Aikenhead, G. S., & Robinson, J. T. (1981). The role of inquiry in science education: Analysis and recommendations. *Science Education*, *65*(1), 33-50.

Wolgast, A., Hille, M., Streit, P., & Grützemann, W. (2020). Does test-anxiety experience impair student teachers' later tendency to perspective-taking? *Acta Educationis Generalis*, *10*(1), 1-24. https://doi.org/10.2478/atd-2020-0001

Wyatt, S. (2005). Extending inquiry-based learning to include original experimentation. *The Journal of General Education*, *54*(2) 83-89.

Yore, L. D. (1984). The effects of cognitive development and age on elementary students' science achievement for structured inductive and semi-deductive inquiry strategies. *Journal of Research in Science Teaching*, *21*(7), 745-753.

Investigation of School Administrators' Humour Styles and School Climate according to Teacher Perceptions

*Fatih Şahin - Hasan Tabak**

Abstract:
Introduction: This research aims to determine the humour behaviours of school administrators according to teacher perception and to reveal the relationship between humour behaviours and school climate.
Methods: The research was carried out in a survey model. The data of the study were obtained from 221 primary school teachers working in Ankara and Aksaray provinces via a questionnaire created online. Regression analysis technique was used to determine the relationship between variables.
Results: According to the results of the research, school administrators showed relatively more positive humour (producer-social humour and affirmative humour) behaviours. In terms of climate, it is seen that the perception of a positive school climate (supportive and intimacy based school climate) is higher than the negative ones. When the relationships between the variables were examined, it was seen that there was a definite increase in the school climate with the school administrator using humour positively. With the rise in the use of refusing or sarcastic humour, there was an adverse increase in school climate.
Discussion: According to these results, it can be argued that humour behaviours of school administrators are an essential determinant in the context of creating a positive school climate in schools.
Limitations: Data from the sample of the study were collected through online questionnaires. Therefore, this research has no claim of generalisability.
Conclusions: Therefore, it is necessary to increase the knowledge and sensitivity of school administrators on how to use and manage humour.

Key words: humour, school climate, school administrator, primary school.

* Fatih Şahin, Gazi University, Faculty of Education, Ankara, Turkey; sahinfatih@gazi.edu.tr
  Hasan Tabak, Aksaray University, Department of Educational Sciences, Aksaray, Turkey; hasantabak@aksaray.edu.tr

Introduction

It can be claimed that humour has an essential role in making working environments more joyful and fun. Although humour may evoke an entertaining or enjoyable state for the person who produces or exhibits it, the humour might be perceived as annoying, disrespectful and disruptive beyond being funny for the person to whom it is directed (Malone, 1980). Therefore, it can be considered that humour plays an essential role in organisational life, both in a positive and negative sense. It is possible to address humour, which is often encountered in organisations, as a characteristic of human nature. Collinson (2002) stated that organisations have a feature characterised by humour and laughter as well as rationality and bureaucracy, and organisational research shows an increasing interest in the humorous aspect of organisations.

In organisations where the administrator constructively uses humour, organisational citizenship level is higher, and employees' confidence in their administrator increases (Tremblay, 2017). Especially in organisations where routine work is performed, it can be claimed that humour has a positive effect in making work more exciting and increasing solidarity among employees (Holmes & Marra, 2002). Organisational commitment (Romero & Arendt, 2011) and motivation (Recepoğlu, Kılınç, & Çepni, 2011) appear at high levels in organisations to which positive humour behaviours are liable. There is a tendency to spend more time at work due to positive humour (Meyer, 1999). When humour is used healthily, it contributes to the employee's feeling of belonging to his/her profession (Goriup, Stričević, & Sruk, 2017). Besides, there is an increase in the job satisfaction of the employees depending on the frequency of humour usage of the administrators (Hurren, 2006; Recepoğlu, 2010; Robert, Dunne, & Iun, 2016). It can be argued that humour used in organisations has a vital function in coping with stress (Özdemir, Sezgin, Kaya & Recepoğlu, 2011; Romero & Arendt, 2011). Humour also plays a crucial role in ensuring communication effectiveness (Pierson & Bredeson, 1993).

The literature on humour emphasises the positive effects of humour on organisational life as well as its adverse effects. According to Collinson (2002), humour, which is far from being a source of social integration, has adverse effects such as reflecting, empowering and highlighting workplace divisions, tensions, conflicts, power asymmetries and inequalities (such as gender, ethnicity, class and disability). Romero and Arendt (2011) associated this use of humour with the superiority theory. For instance, humour can be used as a method to gain superiority over others. Tremblay's (2017) study found that humour behaviours in an aggressive manner adversely affected bilateral relations in organisations, and the humorous attitude had a negative relationship with social inclusion. Özdemir et al. (2011) also found a negative relationship between aggressive humour style and coping with stress. Another study found that aggressive or self-destructive humour positively associated with stress (Romero & Arendt, 2011). Mobbing behaviours and cynicism can be

experienced more especially in organisations where humour has a sarcastic or rejecting characteristic (Cemaloğlu, Recepoğlu, Şahin & Daşcı, 2014; Çetinkaya & Şener, 2016; Yılmaz & Altınkurt, 2016).

The effect of humour on organisational life also makes it essential in the context of administration and leadership (Collinson, 2002; Romero & Arendt, 2011; Zeigler, Boardman & Thomas, 1985). Leaders can use humour as a tactic to influence their followers, mainly when they have limited resources (Avolio, Howell & Sosik, 1999; Kong, Cooper & Sosik, 2019). Associating humour with a fun work environment creates an expectation that administrators will make the work environment more enjoyable. Accordingly, it can be argued that the different styles of humour used in organisations create different relationships (Holmes & Marra, 2002), which are reflected in the organisational climate differently. In addition, Matthias (2014) stated that humour could be used as a tool to improve school climate by reducing school tension felt by students, teachers, parents and community members. Şahin (2017) claimed that in an environment where school administrators and teachers support each other, the usage of humour by school administrators is perceived as more constructive. In studies dealing with humour and school climate, it is seen that teacher-student interaction or classroom processes are frequently examined (e.g. Çelik & Gündoğru, 2016; Darling & Civikly, 1986; Stuart & Rosenfeld, 1994). This study provides a novel approach to the phenomenon of humour in the context of school administration and its relation with the school climate.

1 Humour

Having a sense of humour is a feature that many people want to have, but few people see themselves as sufficient (Hurren, 2006). In particular, humour is seen as an essential tool to make interpersonal relations and social interactions more positive (Nezleks & Derks, 2001; Zeigler et al., 1985). Humour has critical effects in organisational life as well as in individual and community life. Humour is often seen as a way to cope with difficulties in jobs that require intense labour and are high in stress (Collinson, 2002). Thorson and Powell (1993) also described humour as a useful tool for coping with daily life challenges.

Although there are several studies in the literature dealing with different aspects of humour and measuring humour in different dimensions (e.g. Martin, Puhlik-Doris, Larsen, Gray, & Weir, 2003), the scope of this study was limited to the dimensions in the Humour Behaviour Scale (Cemaloğlu, Recepoğlu, Şahin, Daşcı, & Köktürk, 2012): producer-social humour, affirmative humour, non-humorous style, sarcastic humour and rejective humour. In developing this scale, especially Babad's (1974) and Martin's (2007) studies were taken as a significant reference.

Producer-social humour shows the individual's ability to produce humour and use it in a social environment. To create humour, an individual needs to go through a mental process and express himself/herself in a funny language to entertain others (Martin, 2007). Producer-social humour is a humorous style that has a constructive effect on the organisation. Humour-producing people can reveal humorous situations, make subtle jokes, and tell amazing stories (Babad, 1974). In the affirmative humour style, although a person is not the one who jokes or tells funny stories, he/she shows that he/she is ready to laugh at the humour and enjoys humour and looks for humorous situations (Babad, 1974). The person who affirms humour appreciates funny discourses or behaviours, loves jokes and reacts with laughter (Cemaloğlu et al., 2014). According to Babad (1974), the individual in the non-humorous style does not laugh, joke or humour. Administrators' inactivity, as well as their actions, affect the workplace environment (Collinson, 2002). Therefore, it can be argued that an administrator's positive or negative humorous behaviours or actions, as well as indifference towards humour or non-humorous style, have an impact on organisational life. In choosing a non-humorous style by administrators, the risks associated with using humour in organisations are effective. According to Recepoğlu (2010), administrators were not trained as comedians, so using humour could be risky. For example, making a joke where no one laughs can put the person who wants to use humour in a difficult situation. The person can stay away from humour in order not to harm his/her self. Humour in organisations does not always have a positive character and can be used as an asymmetric force or conflict tool (Collinson, 2002). Romero and Arendt (2011) explained this attitude with the theory of superiority and stated that humour could be used to gain an advantage on others. In the sarcastic humour style, a derogatory manner is put forward, and the person who is exposed to humour is mocked, and his/her self is attacked. (Cemaloğlu et al., 2014). The sarcastic humour seen in organisations has an aggressive character, and that can lead to exclude employees from social interactions and cause poor performance (Tremblay, 2017). In the rejective humour style, the individual reacts negatively to humorous behaviours and does not like humour (Cemaloğlu et al., 2017).

2   School climate

The concept of organisational climate was developed in the late 1950s when scientists in the field of education tried to conceptualise the diversity of the work environment. After the study of industrial and social psychologists on the organisational climate, this concept was studied in educational organisations like a school climate (Hoy, 1990). While the first studies on school climate are mostly conducted as a literature review, an increase in the number of experimental studies is observed in the following years. Although there is no international consensus to define the school climate or dimensions of school climate (Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013), it is still

possible to make some explanations dealing with this concept in different aspects. Halpin and Croft (1963), who put forward one of the first studies on school climate, described school climate as similar to personality. Hoy (1991) described the school climate as a set of internal characteristics that differentiate one school from another and affect the behaviour of its members. In a more specific way, they defined it as the relatively permanent quality of the school environment that participants experienced influenced their behaviour and based on perceptions of collective behaviour. This climate is based on their perception of collective behaviour and influences their behaviour. The school climate is based on people's experiences in school life and reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organisational structures (Cohen, McCabe, Michelli, & Pickeral, 2009). Besides, the school climate reflects the school life experiences of students, school staff and parents socially, emotionally, ethically and academically (Thapa et al., 2013).

This climate has an impact on the behaviour of individuals as well as giving identity to the organisation. A positive, healthy organisational climate is needed for the high level of employee well-being, finding the work meaningful, fostering students' resilience, and sustainable development (Di Fabio, 2017a, 2017b; Tamášová & Barnová, 2011). Considering this issue in the context of educational organisations, it can be said that the school climate is an essential predictor of teachers' job satisfaction (Taylor & Tashakkori, 1995) and also has a meaningful relationship with teacher leadership. For example, teacher leadership behaviours are less visible in a restrictive school climate (Kılınç, 2014). Sustainable positive school climate is associated with positive childhood and youth development, effective risk prevention and health promotion efforts, student learning and academic achievement, increased student graduation rates, and teacher retention (Cohen et al., 2009; Thapa et al., 2013). It can be claimed that the school climate is also related to personality traits (Şahin, Yavuz Tabak, & Sönmez, 2019).

Although there are many studies aimed at defining and measuring school climate (Anderson, 1982), this study was initially based on the Organizational Climate Description Questionnaire (OCDQ) developed by Halpin and Croft (1963). This tool has been used frequently in many studies about school climate since its production (Anderson, 1982). Thomas (1976) states that this tool is a practical tool for determining school climate and is widely used in many countries. However, it is crucial to examine the factor structure before applying it to other cultures. The re-developed version of the scale (OCDQ-RE) for primary schools (Hoy, Tarter, & Kottkamp, 1991) was used in the research, which was adapted to Turkish by Kavgacı (2010), and the scope of the study was limited to the dimensions of this scale. In this study, the school climate is considered as supportive, intimacy, directive and restrictive climates.

In a supportive school climate, school administrators support teachers' professional and personal development. In such a school climate, the visibility of the school administrator is high, and the teachers do not have difficulty in interacting with him/her, and can easily talk to him/her (Thomas, 1976). In such an environment, it can be said that the school administrator values teachers, is open to criticism from them and is tolerant. It can be claimed that a supportive school climate is also an open school climate where participation is encouraged. In an open school climate, the school administrator supports teachers' actions and suggestions; he/she provides teachers with space for action and does not disturb them with close supervision. Moreover, in a supportive climate, the school administrator does not tire the teachers with trivial bureaucratic tasks and does not force or block the teachers because he/she knows the intensity of their work (Hoy, Hoffman, Sabo, & Bliss, 1996).

In a restrictive school climate, the school administrator tries to make it difficult for teachers instead of facilitating their work. In such an environment, teachers' workloads are high, and they have routine work to do. In this intensity, teachers have difficulty in focusing on education and training activities (Thomas, 1976). It is possible to see a restrictive school climate as opposed to a supportive school climate. In a directive school climate, teachers are continuously monitored closely by the administrator. It can be argued that such an environment is a closed climate. It is essential to control behaviour in a closed climate (Hoy et al., 1996). An intimate school climate means that teachers have friendly social relationships with each other (Halpin & Croft, 1991). In such a climate, strong ties and close friendships are established between school members and teachers support each other (Hoy & Clover, 1986; Kavgacı, 2010; Kılınç, 2014; Kottkamp et al., 1987). It can be argued that there is an open climate that encourages participation in an intimacy school climate.

The correct use of humour can provide flexibility in the organisation, facilitate communication, provide alternative perspectives, and create a sense of goodwill. All these factors affect leadership and school climate (Zeigler et al., 1985). In this research, it is tried to determine the level of humour in schools and how it is related to school climate. For this purpose, the following questions were sought in the context of teacher perceptions:

1. To what extent do humour styles of school administrators emerge?
2. What are the perceptions of teachers about the school climate?
3. What is the relationship between school administrators' humour styles and school climate?
4. Are the humour styles of school administrators a significant predictor of school climate?

3   Methods

This research, which aims to determine the relationship between school administrator's humour styles and school climate, is a correlational survey model. Correlational studies are designed to determine the relationships between two or more variables. It tries to find out to what extent some relationship types exist. In general terms, the researcher conducts the study without any intervention to find and identify the possible relationships between the phenomena occurring in the natural environment (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2012, pp. 15-16).

3.1 Sample

The sample of the study consists of teachers working in primary schools in the central districts of Ankara and Aksaray. Two hundred twenty-one teachers were reached on the online questionnaire by taking the appropriate sampling method from the population. The majority of the teachers included in the research sample consisted of male teachers. It is seen that the teachers do not exceed the age of 30, and their professional seniority does not exceed 20 years. Demographic data of the sample is given in Table 1.

Table 1

Demographic information statistics

Demographic Variables	*Category*	*f*	*%*
Gender	Female	62	28.1
	Male	159	71.9
Marital status	Married	100	45.2
	Single	121	54.8
Age	22-30 years	105	47.5
	31-38 years	85	38.5
	39-47 years	21	9.5
	48-56 years	10	4.5
Seniority	1-9 years	108	48.9
	10-19 years	86	38.9
	20-29 years	27	12.2
Graduation	College	12	5.0
	Undergraduate	171	67.0
	Graduate	40	28.0
Branch	Pre-school teacher	14	6.3
	Class teacher	64	29.0
	Branch teacher	143	64.7

3.2 Data collection tools

In the study, "Humour Behaviour Scale" developed by Cemaloğlu et al. (2012) was used to determine humour behaviours of school administrators. The revised form of the Organizational Climate Description Questionnaire (OCDQ-RE) was used to determine the school climate for elementary schools. The OCDR-RE developed by Hoy et al. (1991) and adapted to Turkish by Kavgacı (2010).

3.2.1 Humour Behaviour Scale

The scale has 30 items in 5 sub-dimensions: eight items in sarcastic humour style, nine items in producer-social humour style, five items in affirmative humour style, five items in rejective humour style, and three items in non-humorous style. The items were scored on a rating scale from 1 (I do not agree at all) to 5 (I agree). The Confirmatory Factor Analysis (CFA) results of the five sub-dimensions of the Humour Behaviour Scale, and the fit index reference values (Schermelleh-Engel, Moosbrugger, & Müller, 2003) confirm the five sub-dimensions of the scale (χ^2 / sd = 2.45; RMSEA = .07; CFI = .93; GFI = .96), and goodness of fit indices of the model was found to be acceptable.

3.2.2 The revised form of the Organizational Climate Description Questionnaire (OCDQ-RE) for elementary schools

The original form of the OCDQ-RE consists of 42 items in six sub-dimensions. The Turkish form of the OCDQ-RE consists of 25 items in four subscales: supportiveness (8 items), restrictiveness (4 items), directive (5 items), and intimacy (8 items). The items were scored on a rating scale from 1 (never) to 4 (always). The Confirmatory Factor Analysis (CFA) results of the five sub-dimensions of the scale, and the fit index reference values (Schermelleh-Engel et al., 2003) confirm the four sub-dimensions of the scale (χ^2 /sd = 2.34; RMSEA = .06; CFI = .91; GFI = .94), and goodness of fit indices of the model was found to be acceptable. For the factors of the scale, the Cronbach's alpha reliability coefficients were calculated as .92 for the supportive dimension, .80 for the restrictiveness dimension, .88 for the directive dimension, and .89 for the intimacy dimension. In total, this value was found to be .92.

3.3 Data analysis

Before starting the analysis of the data, missing or incorrect values and outliers were analysed. Each scale item taken from 221 teacher opinions in the data set was subjected to z-score testing $\left| \pm 3.29 \right|$ and outliers were tried to be determined. It was determined that the data was within the desired value range, and no data extraction was performed. Demographic data of the participants were determined by percentage (%) and frequency (f) analysis. Within the scope of the research sub-problems, arithmetic mean values of the items in each subscale were determined, and a score was calculated for that factor. Pearson Product Moment Correlation Coefficient (r) was used to calculate the

relationships between variables. Besides, Multiple Linear Regression Analysis was performed to determine the predictive level of independent variables. Data analysis was performed at .05 significance level.

4 Results

In this section, the analysis and interpretation of the data obtained within the scope of sub-problems are given. In this context, the arithmetic means, standard deviation and correlation values calculated for school administrators' humour behaviour and school climate sub-factors are given in Table 2.

Table 2

Means, standard deviations and correlation values of variables

Variables	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Sarcastic	2.01	1.09	-								
2. Producer-Social	2.99	.95	-.13*	-							
3. Affirmative	3.27	.97	-.33**	.74**	-						
4. Rejective	2.24	1.05	.67**	-.35**	-.52**	-					
5. Non-humorous	2.69	1.08	.43**	-.41**	-.55**	.72**	-				
6. Supportive	2.82	.72	-.31**	.52**	.55**	-.45**	-.35**	-			
7. Restrictive	2.41	.74	.49**	.08	-.04	.24**	.17*	.02	-		
8. Directive	2.71	.77	-.17*	.29**	.30**	-.31**	-.24**	.56**	.07	-	
9. Intimacy	2.90	.64	-.08	.33**	.35**	-.22**	-.15*	.57**	.07	.54**	-

$**\ p < .01;\ *\ p < .05$

When the data in Table 2 is examined, it is seen that the teachers' perceptions of the humour style used by the school principals are high in the affirmative and producer-social sub-factors. In addition, non-humorous (M = 2.69), rejection (M = 2.24), and sarcastic (M = 2.01) humour scores are relatively low or less preferred. When teachers' perceptions about school climate were examined, it was found that the values of restrictive (M=2.41), directive (M = 2.71), supportive (M = 2.82) and intimacy (M = 2.90) school climate dimensions were above the average value.

There are significant positive or negative relationships between school principals' humour behaviour and school climate sub-factors. The highest correlation was found with affirmative humour (r = .55), and the lowest correlation was with rejective humour (r = .45). The highest correlation with restrictive school climate was obtained in sarcastic style (r = .49), and the lowest correlation was in affirmative humour style (r = - .04). The highest correlation was found in the affirmative humour style (r = .30), and the lowest correlation was found in rejective humour style (r = - .31). The highest correlation with the intimacy school climate was in the affirmative humour style (r = .35) and the lowest in the rejective humour style (r = - .22). In general, it is seen that the

relationships between the variables are generally low, but both positive and negative medium level relationships are also determined.

In Table 3, there are findings related to regression analysis. When the data in Table 3 is examined, it is seen that there is a moderate and significant relationship between the humour styles sub-dimensions (predictive variables) and school climate sub-dimensions (predicted variables). The school principals' humour style explains 15% of the variance in the supportive school climate, 27% of the variance in the restrictive school climate, 14% of the variance in the directive school climate, and 15% of the variance in the intimacy school climate. When standardised regression coefficients (β) are considered, rejective humour predicts school climate more than the other humour styles. On the other hand, t-tests regarding the significance of regression coefficients indicate that the sarcastic humour style is a significant predictor of the restrictive school climate, the producer-social humour style is a significant predictor of the supportive school climate, the affirmative humour style is a significant predictor of the supportive and intimacy school climate, and the rejective humour style is a significant predictor of the supportive and directive school climate. However, there is no significant predictor of non-humorous style.

Table 3

The results of regression analysis on the level of school principals' humour behaviour which predicts school climate

	Predicted Variable											
	Supportive[a]			*Restrictive*[b]			*Directive*[c]			*Intimacy*[d]		
Predictive Variable	*β*	*t*	*p*	*β*	*t*	*p*	*β*	*t*	*p*	*β*	*t*	*p*
Constant	-	7.22	.00		4.69	.00	-	7.65	.00	-	7.67	.00
1. Sarcastic	-.08	-1.03	.31	.58	7.23	.00	.04	.48	.63	.10	1.19	.24
2. Producer-Social	.28	3.47	.00	.11	1.28	.20	.17	1.80	.07	.16	1.62	.11
3. Affirmative	.25	2.79	.01	.04	.38	.71	.06	.59	.56	.24	2.24	.03
4. Rejective	-.25	-2.60	.01	-.16	-1.54	.13	-.30	-2.59	.01	-.23	-2.05	.04
5. Non-Humorous	.12	1.43	.15	.10	1.12	.26	.06	.66	.51	.16	1.71	.09

[a] $R = .39$, $R^2 = .15$; $F = 26.44$, $p \leq .00$ [b] $R = .52$, $R^2 = .27$; $F = 15.78$, $p \leq .00$
[c] $R = .37$, $R^2 = .14$; $F = 6.91$, $p \leq .00$ [d] $R = .40$, $R^2 = .15$; $F = 7.65$, $p \leq .00$

5 Discussion and suggestions

In this section, the data obtained for each sub-objective of the research are discussed in the context of school principals' humour styles, school climate, the relationship between humour styles and school climate and the level of humour styles predicting school climate. First of all, when school administrators' humour styles are examined in general, they have high scores in their affirmative and producer-social humour styles and low scores in sarcastic and rejective humour styles. On the other hand, it is seen that they have average scores

regarding the non-humorous style. These findings are similar to some related studies (Cemaloğlu et al., 2014). Özdemir et al. (2011) and Yılmaz and Altınkurt (2016) found that positive humour (self-enhancing humour and participatory humour) scores were higher than cynical humour (aggressive humour and self-destructive humour) scores. This situation, which emerges in the perceptions of teachers, shows that positive humour styles occur at high levels and negative humour styles occur at low levels in school administrators. In the research of Şahin (2017), it is seen that constructive humour is emphasised more about school administrators. Because negative humour behaviours are associated with the theory of superiority (Romero & Arendt, 2011), low school administrator scores in this direction can be considered as a favourable situation for the school, especially teachers. Otherwise, it could be interpreted that the administrator misused the hierarchical power of being on top and preferred humour as a tool for this. School administrators are expected to use humour as a healthy communication and interaction tool. When school administrators realise this, humour becomes a useful tool (Zeigler et al., 1985).

Regarding the school climate, teachers think that there is a more intimate climate in their schools, followed by supportive and directive school climates. The scores obtained in these three dimensions are at a high level. On the other hand, teachers' perception of the restrictive climate was low. Çolak and Altınkurt (2017) observed that school administrators exhibit more supportive behaviours than restrictive behaviours, and teachers exhibit more collaborative and sincere behaviours than unconcerned behaviours. Based on these results, teachers' perceptions of school climate tend to be more prone to positive. Supportive school principal behaviours and sincerity-based relationships among teachers indicate that the school has an open and encouraging climate (Hoy et al., 1996). In this context, the results of the research indicate a healthy school climate.

Based on the relations between school administrators' humour styles and school climate, a moderately significant relationship was found between sarcastic humour style and restrictive school climate. On the other hand, a moderately significant, but the negative relationship was found between sarcastic humour style and supportive school climate. It can be argued that sarcastic humour behaviour has aggressive, hostile characteristics. Stuart and Rosenfeld's (1994) study shows that there is no healthy classroom climate in classrooms where humour is used in a hostile manner by teachers. It is possible to make a similar assessment when we take this situation to the school level. It is difficult to establish a healthy school climate in schools where humour is used sarcastically by school administrators. This claim is consistent with the research results. Similar results were obtained in the context of the school climate regarding the rejective humour style. When using humour, risks such as the emergence of an undesirable situation, and someone being uncomfortable with this situation can always arise (Recepoğlu, 2010). Therefore, to make the school climate healthier, it is necessary to consider the possible effects before using humour. Positive and

moderate significant relationships were found between affirmative humour style and supportive and intimate school climates.

Regarding the producer-social style of humour, similar results have been obtained, although there are relatively lower relationships in all dimensions of school climate. The non-humorous style was negatively, moderately and significantly related to the supportive school climate. Based on these results, it can be argued that as teachers' perception of positive humour towards school administrators increase, perceptions about school climate increase positively.

When the relationships between school principals' humour styles and school climate were analysed according to the regression analysis, it was found that the sarcastic humour style was a positive predictor of the restrictive school climate; that rejective humour is a negative predictor of a supportive and directive school climate; producer-social and affirmative humour styles are a positive predictor of the supportive school climate. Similar results were obtained in a study that tried to determine how and to what extent teachers used humour according to student views (Stuart & Rosenfeld, 1994). In this study, it is seen that if the humour is used too much or hostile, the perception of supportive school climate perceived by the students' decreases. When these results are taken into consideration, even if a positive humour behaviour is used more than necessary, that can lead to the formation of an adverse climate.

When the research results are evaluated in general, it can be argued that school administrators should develop a positive attitude towards humour in order to create a positive climate in schools. For this, school administrators need to know how to manage humour (Collinson, 2002). Managers who use humour aggressively cannot be expected to benefit from the power of humour effectively (Tremblay, 2017). According to Collinson (2002), administrators who are mainly focused on control try to suppress and censor humour and laughter in the work environment. In other words, it can be argued that these people have a non-humorous attitude or posture. Therefore, it is shown that making workplaces more enjoyable with a reassuring understanding rather than control-oriented management in organisations, especially in schools where social relations are highly regarded, will have positive effects on the school climate. Tremblay's (2017) study found that the effect of humour was more favourable in organisations with a high level of confidence in support of this claim. In this context, however, simple management initiatives to produce humour to create a fun workplace are unlikely to succeed and can have a negative impact. According to Collinson (2002), these simple initiatives can lead to even a reverse gap in the long run, which can lead to the resumption of humour pressure in organisations. Romero and Arendt (2011) argued that the effective use of humour in organisations could be achieved through a proper analysis of the value judgments and understandings of their target kits. The fact that the administrators who apply humour in schools are aware of this situation and the use of humour without harming their self, especially considering the value

judgments and beliefs of teachers, may contribute to the formation of a healthier school climate.

Conclusion

Although this study shows that there is a significant relationship between humour and school climate, further studies are needed to explain the results in terms of causality. Because in the relevant literature, there are also results that can be perceived as discrete. For example, in organisations with negative superior-subordinate relationships, job satisfaction may be low even if leaders show positive humour behaviours (Robert et al., 2016). Therefore, explaining all organisational variables within the chaotic network by associating them with humour may constitute a lack of perspective. Aware of this limitation, this research was carried out.

References

Avolio, B. J., Howell, J. M., & Sosik, J. J. (1999). A funny thing happened on the way to the bottom line: Humor as a moderator of leadership style. *Academy of Management Journal, 42*(2), 219-227.

Çolak, İ., & Altınkurt, Y. (2017). The relationship between school climate and teacher autonomy behaviors. *Educational Administration: Theory and Practice, 23*(1), 33-71.

Anderson, C. S. (1982). The search for school climate: A review of the research. *Review of Educational Research, 52*(3), 368-420.

Babad, E. Y. (1974). A multi-method approach to the assessment of humor: A critical look at humor tests. *Journal of Personality, 42*(4), 618-631.

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2012). *Scientific Research Methods*. Ankara: Pegem Akademi.

Cemaloğlu, N., Recepoğlu, E., Şahin, F., & Daşcı, E. (2014). Examining relationships between school administrators' humor behaviors and teachers' mobbing experiences according to teacher perceptions. *International Online Journal of Educational Sciences, 6*(3), 570-580.

Cemaloğlu, N., Recepoğlu, E., Şahin, F., Daşçı, E., & Köktürk, O. (2012). Developing humor behavior scale: The study of validity and reliability. *The Journal of Turkish Educational Sciences*, *10*(4), 693-716.

Cohen, J., McCabe, L., Michelli, N. M., & Pickeral, T. (2009). School climate: Research, policy, practice, and teacher education. *Teachers College Record, 111*(1), 180-213.

Collinson, D. L. (2002). Managing humour. *Journal of Management Studies, 39*(3), 269-288.

Çelik, B., & Gündoğdu, K. (2016). The effect of using humor and concept cartoons in high school ICT lesson on students' achievement, retention, attitude and anxiety. *Computers & Education, 103*, 144-157.

Çetinkaya, F. F., & Şener, E. (2016). The effects of manager's humor styles on organisational cynicism perception of employees. *Journal of Business Research-Turk, 8*(3), 207-221.

Darling, A. L., & Civikly, J. M. (1986). The effect of teacher humor on student perceptions of classroom communicative climate. *The Journal of Classroom Interaction, 22*(1), 24-30.

Di Fabio, A. (2017a). Positive Healthy Organisations: Promoting well-being, meaningfulness, and sustainability in organisations. *Frontiers in Psychology, 8*, 1938.

Di Fabio, A. (2017b). The psychology of sustainability and sustainable development for well-being in organisations. *Frontiers in Psychology, 8*, 1534.

Goriup, J., Stričević, J., & Sruk, V. (2017). Is education for using humour in nursing needed? (Slovenian case study on sociological and ergonomic aspects of the impact of humour on nursing professionals). *Acta Educationis Generalis, 7*(3), 45-62. https://doi.org/10.1515/atd-2017-0023

Halpin, A. W., & Croft, D. B. (1963). *The Organisational Climate of Schools.* Chicago: Midwest Administration Center, University of Chicago.

Holmes, J., & Marra, M. (2002). Having a laugh at work: How humour contributes to workplace culture. *Journal of Pragmatics, 34*(12), 1683-1710.

Hoy, W. K. (1990). Organisational climate and culture: A conceptual analysis of the school workplace. *Journal of Educational and Psychological Consultation, 1*(2), 149-168.

Hoy, W. K., & Clover, S. I. R. (1986). Elementary school climate. A revision of the OCDQ. *Educational Administration Quarterly, 22*(1), 93-110.

Hoy, W. K., & Hannum, J. W. (1997). Middle school climate: An empirical assessment of organisational health and student achievement. *Educational Administration Quarterly, 33*(3), 290-311.

Hoy, W. K., Hoffman, J., Sabo, D., & Bliss, J. (1996). The organisational climate of middle schools: The development and test of the OCDQ-RM. *Journal of Educational Administration, 34*(1), 41-59.

Hoy, W. K., Tarter, C. J., & Kottkamp, R. B. (1991). *Open Schools, Healthy Schools: Measuring Organisational Climate*. Corwin Press.

Hurren, B. L. (2006). The effects of principals' humor on teachers' job satisfaction. *Educational Studies, 32*(4), 373-385.

Kavgacı, H. (2010). *Organisational Climate and School-Family Relations in Primary Schools* (unpublished Master's thesis). Ankara: Gazi University, Institute of Educational Sciences.

Kılınç, A. Ç. (2014). Examining the relationship between teacher leadership and school climate. *Educational Sciences: Theory and Practice, 14*(5), 1729-1742.

Kong, D. T., Cooper, C. D., & Sosik, J. J. (2019). The state of research on leader humor. *Organisational Psychology Review, 9*(1), 3-40.

Kottkamp, R. B., Mulhern, J. A., & Hoy, W. K. (1987). Secondary school climate: A revision of OCDQ. *Educational Administration Quarterly, 23*(3), 31-48.

Malone, P. B. (1980). Humor: a double-edged tool for today's managers? *Academy of Management Review, 5*(3), 357-360.

Martin, R. A. (2007). *The Psychology of Humor: An Integrative Approach*. Burlington, MA: Elsevier Academic.

Martin, R. A., Puhlik-Doris, P., Larsen, G., Gray, J., & Weir, K. (2003). Individual differences in uses of humor and their relation to psychological well-being: Development of the Humor Styles Questionnaire. *Journal of Research in Personality, 37*(1), 48-75.

Matthias, G. R. (2014). *The Relationship between Principals' Humor Style and School Climate in Wisconsin's Public Middle Schools* (Doctoral dissertation). Milwaukee: The University of Wisconsin.

Nezlek, J. B., & Derks, P. (2001). Use of humor as a coping mechanism, psychological adjustment, and social interaction. *Humor, 14*(4), 395-414.

Özdemir, S., Sezgin, F., Kaya, Z., & Recepoğlu, E. (2011). The relationship between primary school teachers' coping styles with stress and humor styles. *Educational Administration: Theory and Practice, 3*(3), 405-428.

Recepoğlu, E. (2010). The effects of principals' humor on teachers' job satisfaction. *Education and Science, 33*(150), 74-86.

Recepoğlu, E., Kilinç, A. Ç., & Çepni, O. (2011). Examining teachers' motivation level according to school principals' humor styles. *Educational Research and Reviews, 6*(17), 928-934.

Pierson, P. R., & Bredeson, P. V. (1993). It is Not Just a Laughing Matter: School Principals' Use of Humor in Interpersonal Communications with Teachers. *Journal of school leadership, 3*(5), 522-533.

Robert, C., Dunne, T. C., & Iun, J. (2016). The impact of leader humor on subordinate job satisfaction: the crucial role of leader–subordinate relationship quality. *Group & Organization Management, 41*(3), 375-406.

Romero, E. J., & Arendt, L. A. (2011). Variable effects of humor styles on organisational outcomes. *Psychological Reports, 108*(2), 649-659.

Şahin, A. (2017). The use of humor by primary school administrators and its organisational effect on schools. *Educational Policy Analysis and Strategic Research, 12*(2), 6-23.

Şahin, F., Sönmez, E., & Tabak, B. Y. (2019). A variable predicting school climate: The personality traits of school principals. *Başkent University Journal of Education, 6*(2), 202-212.

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive

goodness-of-fit measures. *Methods of Psychological Research Online*, *8*(2), 23-74.

Stuart, W. D., & Rosenfeld, L. B. (1994). Student perceptions of teacher humor and classroom climate. *Communication Research Reports, 11*(1), 87-97.

Tamášová, V., & Barnová, S. (2011). School climate as the determinant of the relationship between the level of students' resilience and school satisfaction. *Acta Educationis Generalis, 1*(1), 19-37. https://doi.org/ 10.1515/atd-2015-0037

Taylor, D. L., & Tashakkori, A. (1995). Decision participation and school climate as predictors of job satisfaction and teachers' sense of efficacy. *The Journal of Experimental Education, 63*(3), 217-230.

Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A review of school climate research. *Review of Educational Research, 83*(3), 357-385.

Thomas, A. R. (1976). The organisational climate of schools. *International Review of Education, 22*(4), 441-463.

Thorson, J. A., & Powell, F. C. (1993). Development and validation of a multidimensional sense of humor scale. *Journal of Clinical Psychology, 49*(1), 13-23.

Tremblay, M. (2017). Humor in teams: Multilevel relationships between humor climate, inclusion, trust, and citizenship behaviors. *Journal of Business and Psychology, 32*(4), 363-378.

Ziegler, V., Boardman, G., & Thomas, M. D. (1985). Humor, leadership, and school climate. *The Clearing House, 58*(8), 346-348.

An Anthropocentric Evaluation of the New English Language Teaching Program for Lower Secondary School in Turkey

Ahmet Erdost Yastıbaş*

Abstract:
Introduction: The earth has entered a new geological epoch: the Anthropocene. The Anthropocene demonstrates how human activities have changed the world negatively by causing several environmental issues such as global warming. Therefore, it has become an important problem for people. Education should be reconsidered according to the new epoch to deal with it. There is a trans-disciplinary call for this issue. In relation to this call, the present study has aimed to evaluate the new English language teaching program (ELTP) for lower secondary school (5th, 6th, 7th, and 8th grades) in terms of the Anthropocene in Turkey.

Methods: The present study was designed as a qualitative study. The data collection tools were the new ELTP for lower secondary school and the 5th, 6th, 7th, and 8th-grade English language course books prepared according to the new program. The data were analyzed through documentation analysis. Triangulation and thick descriptions were used to make the study trustworthy.

Results: The documentation analysis of the data has showed that there are six themes related to the nature in the new ELTP for lower secondary school: theme 9 (the animal shelter) in the 5th grade; themes 4 (weather and emotions) and 9 (saving the planet) in the 6th grade; themes 4 (wild animals) and 9 (environment) in the 7th grade; theme 10 (natural forces) in the 8th grade. The learning outcomes and language skills of each theme were prepared according to the contents of the themes. Theme 9 in the 5th grade shows how human activities can affect the environment positively. Theme 4 in the 6th grade indicates how the environment can affect people. The rest demonstrate how human activities have affected the nature negatively and how people can save the nature.

Discussion: Theme 9 (saving the planet) in the 6th grade, themes 4 (wild animals) and 9 (environment) in the 7th grade, and theme 10 (natural forces) in the 8th grade explain how several environmental issues have occurred owing to human activities, how these issues have affected the

---
* Ahmet Erdost Yastıbaş, Atilim University, School of Foreign Languages, Ankara, Turkey; ahmet.yastibas@atilim.edu.tr

nature and human lives negatively, and how people can deal with these issues. Theme 9 (the animal shelter) in the 5th grade informs students about how human activities can affect the nature positively, and theme 4 (weather and emotions) in the 6th grade about how the environment can affect people. Through these themes, the new ELTP for lower secondary school can enable English language students to understand that people are a part of the nature, have the power to change the environment, and can live with the environment in balance.

Limitations: The curriculum evaluation is only related to the new ELTP for lower secondary school (5th, 6th, 7th, and 8th grades) in Turkey.

Conclusion: The Anthropocentric evaluation of the new ELTP for lower secondary school has shown that it can raise English language students' awareness of the relationship between people and the nature and their effects on each other.

Key words: the Anthropocene, the new English language teaching program, lower secondary school, curriculum evaluation.

Introduction

There are different geological epochs in the geological history of the world. The latest epoch following the Holocene is the Anthropocene. The Anthropocene plays a significant role in the future of the world because according to Crutzen (2006a, 2006b), Lewis and Maslin (2015), Steffen, Grinevald, Crutzen, and McNeill (2013), and Zalasiewicz, Williams, Haywood, and Ellis (2011), this new epoch indicates that people have become the only force on the world that changed, is changing, and will continue to change the environment deeply and negatively. The Anthropocene is closely related to human activities which directly affect the environment. Human activities result from overpopulation (Crutzen, 2006a, 2006b; Steffen et al., 2013; Zalasiewicz, Williams, Steffen, & Crutzen, 2010) and the accompanying increasing need for food, water, and better life conditions (Crutzen, 2006a, 2006b). Such human activities include deforestation (Crutzen, 2006a, 2006b; Lewis & Maslin, 2015; Steffen et al., 2013; Zalasiewicz et al., 2011), excessive use of water resources (Crutzen, 2006a, 2006b; Steffen et al., 2013), increasing amount of carbon dioxide (Crutzen, 2006a, 2006b; Steffen et al., 2013; Zalasiewicz et al., 2010; Zalasiewicz et al., 2011) and other greenhouse gases (Crutzen, 2006a), global warming (Crutzen, 2006a, 2006b; Lewis & Maslin, 2015; Steffen et al., 2013; Zalasiewicz et al., 2010), the hole in the ozone layer (Crutzen, 2006a, 2006b; Lewis & Maslin, 2015; Steffen et al., 2013), and the amount of nitrogen in water and land (Crutzen, 2006b; Lewis & Maslin, 2015; Steffen et al., 2013). All of these activities have resulted in polluting the environment which has reduced biodiversity and caused many animal, insect, and plant species to become extinct (Crutzen, 2006a, 2006b). Therefore, the effects of human activities on the world

are so huge that natural forces cannot compete with human activities in shaping the world (Steffen et al., 2013).

The effects of human activities on the environment have made the Anthropocene the most important problem to deal with for people as Zalasiewicz et al. (2011) emphasized. Dealing with the Anthropocene is vital to the sustainability of the environment for the future (Crutzen, 2006b). Therefore, it has led to an urgency for people to deal with it. People can deal with this urgency in some ways, one of which is education.

Dealing with the Anthropocene requires the reconsideration of education which makes the relationship between people and the world its center so that students can learn, understand, and realize that people are a part of the nature (Somerville, 2017). She mentioned that such education is based on the interaction between the human world and the more-than-human world which can be defined as other living and nonliving things in the environment. According to her, it aims to enable students to understand the essence of human existence (what makes humans is the more-than-human world) and the dependency of humans on the more-than-human world, therefore, in addition, it can help students to develop an understanding of how people can live in balance with the non-human (Somerville, 2017; Taylor, 2017). According to Sterling (2017), such education with these features can indicate students how human activities in nature can affect the environment and human lives negatively. He also added that this awareness raising can cause students to understand that people can live with the environment in balance (Sterling, 2017).

The call for trans-disciplinary education is necessary for the reconsideration of education considering the Anthropocene (Carstens, 2016; Leinfelder, 2013; Somerville, 2017). Therefore, including the Anthropocene in the curriculum of different disciplines has been suggested by different scholars: geography education by Pawson (2015), chemistry education by Mahaffy (2014), and science education by Gray and Colluci-Gray (2014), Gilbert (2016), and Wagler (2011). This can help students be aware of the relationship between human beings and non-human beings and their effects on each other, so they can learn how to live with the world in balance (Sterling, 2017).

English language teaching can also enable English language (EL) students to be aware of the Anthropocene and behave accordingly to live well with nature and contribute to a sustainable future. For this purpose, it should have and adopt an ecological attitude toward teaching English. The first way to achieve this goal is including the Anthropocene or topics related to it in the curriculum. Yet, the literature review has showed that several studies have been conducted to evaluate the English language teaching curricula for lower secondary school (also known as middle school) prepared at different times in Turkey (Aksoy, 2020; Aktı Aslan & İzci, 2017; Arı, 2013; Demirtaş & Erdem, 2015; Dinçer & Koç, 2020; Dinçer & Saracalıoğlu, 2017; Kozikoğlu, 2014; Ordem & Ulum, 2020). These studies have generally focused on EL teachers' and students' ideas

about the curriculum and have shown that the evaluated curricula have some strengths but need to be improved. These studies have not evaluated the curricula Anthropocentrically. In addition, two studies were found in the international literature related to language teaching when the present study was made. Goulah (2018) discussed the place of religion in language teaching in the Anthropocene, and Prádanos (2015) indicated that Spanish language course books had little ecological value. Therefore, the present study has aimed at evaluating the part of the new English language teaching program (ELTP) related to lower secondary school that was prepared in 2018 by the Ministry of National Education. Accordingly, it has focused on the research questions below:

1. Does the new ELTP for lower secondary school have any theme related to nature?
2. What are the students supposed to achieve in the nature-related theme(s) according to the new ELTP for lower secondary school as language skills and learning objectives?
3. How do the English language course books of the 5th, 6th, 7th, and 8th grades prepared according to the new ELTP for lower secondary school contextualize and practice the theme(s)?

1 Methodology

1.1 Research design

Through qualitative research, researchers can explore a social or human issue by understanding and having the meanings ascribed to it, so it provides a complex and detailed understanding of it (Creswell, 2014; Creswell & Poth, 2018). As stated in the introduction, the Anthropocene affects human life and the environment negatively and deeply, so its negative effects make it a problem for human beings. In relation to this problem, the present study aimed to evaluate the part of the new ELTP for lower secondary schools in terms of how it deals with what the Anthropocene has showed people. Thus, it was designed as a qualitative study to provide a complex understanding of it in detail.

1.2 Research context

English is the most commonly taught foreign language in Turkey. The Ministry of National Education (MNE) prepares two centralized ELTPs for basic education and secondary education. In Turkey, basic education is composed of two steps: a) primary school (from 1st grade to 4th grade); and b) lower secondary school or middle school (from 5th grade to 8th grade). Secondary education is related to high school (from 9th grade to 12th grade). The centralized programs are followed to teach English by private and public primary, lower secondary, and high schools in Turkey. The curricula are prepared according to the levels of the Common European Framework of

Reference for Languages (CEFR). According to the part of the ELTP for lower secondary school, the 5th and 6th-grade syllabi are aligned with the A1 level of the CEFR, while the 7th and 8th-grade syllabi are aligned with the A2 level of the CEFR. English language course books are prepared by the Turkish authors according to the ELTPs under the supervision of the MNE and are used to teach English in both private and public primary, lower secondary, and high schools in Turkey.

1.3 Data collection tools
Five documents were used to collect data.
1.   İngilizce Dersi Öğretim Programı (İlkokul ve Ortaokul 1, 2, 3, 4, 5, 6, 7 ve 8. Sınıflar) [English Language Teaching Program (Primary School and Lower Secondary School 1st, 2nd, 3rd, 4th, 5th, 6th, 7th and 8th Grades School9th, 10th, 11th and 12th grades)]: The document was prepared by the Ministry of National Education in 2018. The first and second research questions were answered through this document.
2.   The third research question was answered through the four English language course books which were prepared according to the new ELTP and published by the Ministry of National Education to use in lower secondary or middle schools in Turkey. These books are:
       a) Ortaokul ve İmam Hatip Ortaokulu İngilizce 5 Ders Kitabı [Middle School and Religious Middle School English 5 Course Book] (Yalçın, Genç, Orhon, & Şahin, 2019);
       b) Ortaokul ve İmam Hatip Ortaokulu İngilizce 6 Ders Kitabı [Middle School and Religious Middle School English 6 Course Book] (Demircan, Akıskalı, Berket, & Günay, 2019);
       c) Ortaokul ve İmam Hatip Ortaokulu İngilizce 7 Ders Kitabı [Middle School and Religious Middle School English 7 Course Book] (Aykanat Erdem, Balcı, & Duran Özdil, 2019); and
       d) Mastermind Ortaokul ve İmam Hatip Ortaokulu İngilizce 8 Ders Kitabı [Mastermind Middle School and Religious Middle School English 8 Course Book] (İlter, İzgi, Çavuşer Özdemir, Türkeri Yeter, & Çavuşer Yünlü, 2019).

1.4 Data analysis
Documentation analysis was used to analyze the documents. The researcher followed the framework that Yıldırım and Şimşek (2013) suggested to use in making documentation analysis. The framework is showed in the figure below.
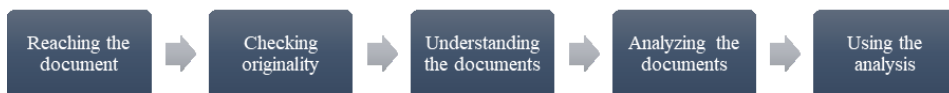
Figure 1. Steps of documentation analysis offered by Yıldırım and Şimşek (2013).

The researcher reached the printed versions of the 5th, 6th, 7th, and 8th-grade EL courses published by the Ministry of National Education in 2019 and the online version of the part of the new ELTP for lower secondary schools on its official website in relation to the research purpose and research questions of the present study. Therefore, all of the documents were considered to be original. Besides, the documents were understandable because the researcher was an English language teacher with 10-year teaching experience and taught different English courses for general, academic, specific, and occupational purposes. In those courses, he used the curricula and syllabi prepared by the departments and sometimes prepared and developed his syllabi during this time period. He also attended curriculum and/or syllabus evaluation meetings and received curriculum and syllabus evaluation courses. These experiences enabled him to understand the documents. A documentation analysis protocol was developed and used according to the literature to analyze the documents in the fourth step and to explain the research questions in the fifth step.

1.4 Trustworthiness
Triangulation can make a qualitative study trustworthy because according to Creswell and Poth (2018), it helps to corroborate the evidence through multiple data collection tools. Therefore, the present study used triangulation because the findings obtained from the documentation analysis of the new ELTP (which was the main data collection tool) were supported by the documentation analysis of the course books prepared and published by the Ministry of National Education. Besides, Creswell and Poth (2018) stated that providing a rich and thick description can also make a qualitative study trustworthy because a rich and thick description indicates that the qualitative analysis reflects only what is found out in the research (Lincoln & Guba, 1985). Thus, the rich and thick description of the data was used to support the qualitative analysis in the present study.

2 Results
The findings of the study were presented according to the research questions.

2.1 Theme(s) related to nature in the new ELTP for lower secondary school
The part of the ELTP for lower secondary school includes ten themes. The themes in each grade are presented in the table below.

Table 1

Themes in the syllabi of the 5th, 6th, 7th, an 8th grades

Themes	5th Grade	6th Grade	7th Grade	8th Grade
1	Hello	Life	Appearance and personality	Friendship
2	My town	Yummy breakfast	Sports	Teen life
3	Games and hobbies	Downtown	Biographies	In the kitchen
4	My daily life	Weather and emotions	Wild animals	On the phone
5	Health	At the fair	Television	The Internet
6	Movies	Occupations	Celebrations	Adventures
7	Party time	Holidays	Dreams	Tourism
8	Fitness	Bookworms	Public buildings	Chores
9	The animal shelter	Saving the planet	Environment	Science
10	Festivals	Democracy	Planets	Natural forces

All of the syllabi have themes directly related to the nature. There is one theme in the 5th-grade syllabus. It is theme 9 (the animal shelter). Themes 4 (weather and emotions) and 9 (saving the planet) are nature-related themes in the 6th-grade syllabus. Like the 6th-grade syllabus, the 7th-grade syllabus has two nature-related themes. They are themes 4 (wild animals) and 9 (environment). Like the 5th-grade syllabus, there is one theme related to the nature in the 8th-grade syllabus. It is theme 10 (natural forces).

2.2 Expectations from the students to achieve in the nature-related theme(s) in terms of language skills and learning objectives

The new ELTP has focused on listening, speaking, and reading in 5th-grade syllabus in terms of language skills and learning outcomes. A 5th-grade EL student is expected to talk about the actions of animals and people. He/she can also understand the descriptions about animals' and people's actions in short, simple, written and oral texts.

In the 6th, 7th, and 8th-grade syllabi of the new ELTP, the focus of language skills and learning outcomes is on listening, speaking, reading, and writing. Speaking is categorized as spoken interaction and production. In theme 4 of the 6th-grade EL course book, an EL student can listen for specific information in brief texts related to weather conditions and emotions. He/she can ask people questions about the weather and speak to them about the weather, weather

conditions, and emotions. In relation to these goals, he/she is expected to read and understand simple and short texts about the same topics in reading. In theme 9, he/she can identify appropriate attitudes toward energy saving and environmental protection in simple oral texts. He/she can realize suggestions to protect the environment in listening. He/she can speak to other students about the protection of the environment by making suggestions. He/she is expected to read and understand the passages about the protection of the environment in addition to writing about how to protect the environment.

According to the 7th-grade syllabus, an EL student is expected to find out wild animals' names in simple and short oral texts in theme 4. It is also expected from him/her to ask questions to people about wild animals and their characteristics in speaking. He/she can also recognize wild animals' names in reading texts and describe wildlife by writing about it. In theme 9, he/she can listen to simple texts and understand the commonly used phrases and vocabulary about the environment. In reading, it is expected from him/her to read for specific information in passages related to the environment. In writing, he/she is supposed to compose brief and simple messages related to the environment.

In the 8th-grade syllabus, an EL student is supposed to listen for the main details of TV news that focuses on natural forces and disasters. In speaking, he/she can express his/her predictions about the future of the Earth and support them by talking about the reasons and results of his/her predictions. In reading, he/she can read for specific information in passages about natural forces and disasters. He/she is expected to write a short paragraph about what causes natural forces and disasters and how they influence people and the environment.

2.3 Conceptualization and practice of the nature-related theme(s) by the 5th, 6th, 7th, and 8th-grade EL course books

In the 5th-grade EL course book, theme 9 starts by a talking activity about animals and pets. Elephant, monkey, bee, dog, cat, horse, duck, snake, lion, wolf, parrot, and cow are the target words in the theme (Yalçın et al., 2019, p. 144). The listening activities focus on a) a dialogue between Sally and her mom who talk about the actions of different animals and people in the town animal shelter; and b) simple oral texts about the actions of Susan, Betty, Mike, and Jimmy in animal-related places. The four reading texts in the course book give information about a) what Tim and his family are doing in their farm; b) what Steve and his parents are doing in their village; c) what Mark, Paul, Mary, Linda, and Lisa are talking to one of their parents about environment-related actions; and d) what Rose and her vet dad are talking about an injured puppy. The speaking part of the theme is contextualized as people and animals' actions in nature-related pictures. It requires talking about what people and/or animals are doing in the pictures. During the whole theme, human actions in the environment such as collecting eggs, watering plants, and feeding animals are constantly mentioned and practiced in the exercises.

In the 6th-grade EL course book, theme 4 focuses on weather conditions and people's feelings in different weather conditions. Target words include the words used to explain a) weather conditions such as sunny, stormy, and freezing; and b) feelings including moody, scared, and anxious (Demircan et al., 2019, pp. 66, 67, 69). The listening activities require identifying which weather conditions are mentioned and finding out how Alan and Barbara feel in different weather conditions. Besides, there are two reading texts. The first one is a postcard from Paola to Cemre about different weather conditions and her feelings in these weather conditions in Rome. The second reading passage is a weather forecast where students learn weather conditions, temperatures, and people's feelings in different parts of a country. The assessment part asks students to prepare a poster where weather conditions, temperatures, and people's feelings are compared in two cities.

Theme 9 in the 6th-grade EL course book deals with different types of pollution and solutions to them. Target words can be categorized as good and bad for the environment. The good include recycling batteries, papers, and plastic, turning off the lights and the tap, and saving energy, while harming animals, cutting down trees, and throwing rubbish around are among the bad ones (Demircan et al., 2019, pp. 159-173). Students are asked to talk about several environmental problems such as cutting down trees shown in the pictures and described in the exercises. They need to find out and offer solutions to these problems to save the environment in these activities. There are two reading texts in theme 9. The first one is about the Mother Earth that tells how human activities have changed her by creating different types of pollution such as water pollution and what should be done to prevent more pollution. The other one is a dialogue between Ali and his parents who remind him of what he should do to save the environment before he leaves home. The oral text is based on a dialogue among Alex, Julia, Steve, and their teacher who talk about human activities as the reasons for environmental problems (water pollution, traffic jam, and deforestation) and solutions to such problems. The writing section wants students to write slogans for the protection of the environment. The project part asks them to use waste materials to make a useful object.

In the 7th-grade EL book, theme 4 is contextualized according to endangered and extinct wild animals. It begins by talking about some wild animals and whey they are dangerous. Target words are elephant, lion, bear, zebra, crocodile, tiger, snake, eagle, monkey, rhino, kangaroo, dolphin, whale, shark, octopus, mammals, reptiles, carnivores, and herbivores (Aykanat et al., 2019, pp. 48-49). The reading section includes a dialogue between Tom and Leo about one extinct animal (saber-toothed tiger), a living animal (Tiger), and their characteristics. The other reading text is based on three volunteers of the World Wide Fund for Wildlife who informs about three endangered animals (the Mediterranean monk seals, Asian elephants, and giant pandas), their characteristics, human activities causing them to be endangered, and solutions to survive them. The listening

section includes an oral text about wild animals and why three of animal species (some kinds of sharks, owls, and polar bears) are endangered. The speaking section requires talking about extinct and endangered animals, their characteristics, the reasons for their being extinct and endangered, and the ways to help endangered animals survive. The writing section is based on preparing a brochure about giraffes, their characteristics, the effects of human activities on them, and the ways to survive them. The project part asks for presenting the characteristics of and the ways to protect two wild animals in a poster.

Theme 9 in the 7th-grade EL course book studies the environment in terms of types of pollution and solutions to deal with them. It starts by talking about types of pollution and the solutions to them. Target words are air pollution, water pollution, global warming, deforestation, pesticides, nuclear waste, rainforest, solar energy, wind energy, recycle, an eco-friendly bag, and plant a tree (Aykanat et al., 2019, p. 108). The reading section includes a dialogue about global warming and two reading texts about deforestation and wasting energy. They explain how human activities have caused these environmental problems, how they affect the environment and people, and how they can be dealt with. The speaking section asks students to talk about different environmental problems such as the extinction of animals and global warming, solutions to these problems, and an environmental protection campaign that they will make. They are expected to give explanations and reasons for the solutions they offer. In the listening section, there is a dialogue between Emily and her father who talk about making a campaign "Plant your own tree" to prevent air pollution. In the writing section, students are asked to write a paragraph about two environmental issues such as noise pollution and suggestions to prevent them. The poster part requires offering solutions to protect the nature by giving explanations and reasons.

Theme 10 in the 8th-grade EL book considers natural forces as natural and human-initiated disasters. It begins by talking about natural forces in different places. Target words are volcano, earthquake, tornado, drought, tsunami, hurricane, erosion, deforestation, animal and plan extinction, global warming, and avalanche (İlter et al., 2019, pp. 120-130). Students are asked to talk about natural and human-initiated forces and disasters including global warming and destructive floods by explaining their reasons, their effects on the environment and human life, and some solutions to them. Besides, they are expected to determine and talk about how eco-friendly they are. There are three reading passages: a blog writing about global warming, a dialogue between Aslı and Betty about the Amazon forests, and a news report about the irresponsible use of natural resources. They explain how human activities have caused these problems, how these problems have influenced the environment and people, and/or how these problems can be dealt with. The listening section gives information about the avalanche in Artvin (a Turkish city) and its effects on people and the environment in the city. The writing section requires writing a

paragraph about a natural force in terms of its reasons, effects on life, and solutions.

3   Discussion

Theme 9 is related to the animal shelter in the 5th-grade syllabus. It can indicate EL students the interaction between human beings and animals through the reading passages about Tim and his family and Steve and his parents because the passages explain the lives of those people and their actions such as milking the cows and watering plants in a farm and village. Other reading texts and the listening texts can inform students about the positive effects of human activities on animals since these texts mention positive human activities such as adopting an animal and feeding an animal for animals. Therefore, these texts can raise EL students' awareness of the interdependency of human beings and animals and their effects on each other. This awareness is promoted by the speaking activities. As a result, the contextualization and practice of theme 9 in the course book can help students to achieve what is expected from them and can make the 5th-grade syllabus ecological to some extent.

Theme 4 of the 6th-grade EL syllabus is based on weather conditions and people's emotions in different weather conditions. It can enable EL students to understand the effect of the nature on people through the reading, listening, speaking, writing, and assessment sections which show how people's emotions change in different weather conditions. The contextualization and practice of the theme are aligned with the course objectives tightly. As a result, theme 4 can help raise students' awareness of how the nature can affect people's lives including their emotions.

Theme 9 in the 6th-grade EL syllabus is about saving the planet. Unlike theme 4 which shows how the nature can affect people, theme 9 can indicate EL students how people can affect the nature negatively through their activities. The reading and oral texts explain how human activities have caused several environmental problems and how such problems can be dealt with and overcome by human beings. Similarly, the speaking parts emphasize the responsibility of people for saving the world by making students talk about environmental issues and offer solutions to them for making the world better. The project part can also help them understand that they can help the environment by reusing their waste materials. These parts, therefore, can inform students about the close relationship between people and the environment, the negative effects of human activities on the environment, and the responsibility of people for the environment. The contextualization and practice of theme 9 are aligned with the course objectives well. Consequently, theme 9 can contribute to raising students' awareness of the negative effects of human activities on the environment and their responsibility for saving it. It can enable them to practice their awareness by producing something from waste material.

Theme 4 in the 7th-grade syllabus demonstrates the negative and destructive effects of human activities on wild animals to EL students. The main focus of theme 4 is on wild animals, especially the ones which have become extinct or endangered because of human activities such as overhunting. Its reading, listening, speaking, and writing parts can help students understand this. Besides, the theme also indicates them that people can do things to save wild animals especially through the writing and project sections. The contextualization and practice of theme 4 seem to enable students to meet its objectives. Consequently, theme 4 can show the destructive influence of people on wild animals to students and encourage them to find out solutions to this problem, so it can raise students' awareness.

Theme 9 approaches the environment in terms of how human beings have caused different types of pollution and what they should do to deal with these pollution types. Accordingly, the reading section informs students about these two points as well as the negative effects of environmental problems on people and the environment. The speaking section supports the reading section because students are asked to talk about different environmental problems and make suggestions to deal with them by explaining their reasons for their suggestions. Like the speaking section, they are asked to do similar things in the writing and poster sections, so these two sections can encourage the active participation of students in the environmental issues more. Also, the listening and speaking activities about organizing an environmental protection campaign can reinforce the fact that people can change what they have done to the environment. The objectives of theme 9 can be met by EL students through this contextualization and practice of the theme. Therefore, theme 9 can enable them to be more sensitive to the environment and encourage them to take actions for the protection of the environment.

Like the themes of the 7th-grade syllabus, theme 10 in the 8th-grade syllabus explains students how human activities have caused natural disasters, how natural disasters have influenced people's lives and the environment negatively to a big extent, and how people can reverse what they have done to the environment. The reading section supports this by informing students about the possible answers to these questions. The listening text emphasizes that what happened in Artvin was the result of human activities. In relation to the reading and listening sections, the speaking section also promotes the fact that human activities may be harmful to the environment due to their negative effects on the environment, but people can change what they have created in a positive way. The section can do this by having students talk about different natural disasters, their reasons (generally related to human activities), their effects on people's lives and the environment, and the solutions to the disasters. The writing section also promotes this fact by following a similar procedure. Due to the contextualization and practice of the theme, students can meet the objectives of

the theme. Consequently, theme 10 can be considered as effective in helping students to raise their awareness and become more sensitive to the environment. Themes 9 in the 6th grade, 4 and 9 in the 7th grade, and 10 in the 8th grade focus on the environmental issues considered as the indicators of the Anthropocene (Crutzen, 2006a, 2006b; Lewis & Maslin, 2015; Steffen et al., 2013; Zalasiewicz et al., 2010; Zalasiewicz et al., 2011). The contents of these themes can provide EL students with a clear and understandable cause-effect relationship between human activities and the environmental issues, so students can understand that human activities have caused serious problems in the environment as Sterling (2017) stated. Besides, the themes can enable them to realize that people have the power to change the nature through their activities as mentioned by Crutzen (2006a, 2006b), Lewis and Maslin (2015), Steffen et al. (2013), and Zalasiewicz et al. (2011). Besides, the themes inform students that human can do several things to reverse the negative effects of human activities on the environment, which can teach students how they can live with the environment in balance because ecological education aims to show this to students (Somerville, 2017; Taylor, 2017). Besides, theme 9 in the 5th grade shows how people can contribute to the environment through their actions because it includes human actions such as feeding animals, watering the plants, examining animals, and donating money for animals that can be considered beneficial to the environment. Also, theme 4 in the 6th grade supports the fact that the environment can also affect people. Therefore, all of these themes in the new ELTP for lower secondary school can enable EL students to realize, find out, and understand that people are part of the nature, that the more-than-human world constitutes people, and that people are dependent on the more-than-human world (Somerville, 2017). As a result, the new ELTP for lower secondary school in Turkey can respond to the trans-disciplinary call made by Carstens (2016), Leinfelder (2013), and Somerville (2017) to some extent. Thus, EL students can contribute to the sustainability of the environment for the future as Crutzen (2006b) emphasized.

Conclusions

The Anthropocene is considered a big problem for people due to the destructive effects of human activities on the environment which reduce the sustainability of the environment for the future. One way to deal with what the Anthropocene has revealed is education, and there is a trans-disciplinary call for this. The present study has aimed to evaluate the new ELTP for lower secondary school in Turkey with this purpose. The findings of the study have indicated that the new ELTP has 6 themes related to the nature and can enable EL students to raise their awareness of the fact that human activities have affected the nature negatively and that people can do something to change this situation.

This study can be useful for EL teachers, course book writers, and curriculum developers because it provides them with the information about what the

Anthropocene means and how they can evaluate their curricula and course books with an Anthropocentric perspective. Such evaluation can show the strengths and weaknesses of their curricula and course books in terms of the Anthropocene, so they can work on their weaknesses, compensate for the weaknesses, and contribute to the sustainable future of the world by raising their students' awareness.

For the same research purpose, future research can be made to evaluate the whole English language teaching curriculum and the syllabus of specific grades in different research contexts by following the research methodology of the present study. Also, future research can evaluate EL course books by following the methodology of the present study for the same research purpose. Such evaluation can be integrated with EL material development research to make the curriculum, syllabus, and course books more ecological.

References

Aksoy, E. (2020). Evaluation of the 2017 updated secondary school English curriculum of Turkey by means of theory-practice link. *Turkish Journal of Education, 9*(1), 1-21.

Aktı Aslan, S., & İzci, E. (2017). Evaluation of secondary school English teaching program according to the remarks of teachers with context, input, process and product (CIPP) model. *İnönü University Journal of the Faculty of Education, 18*(2), 33-44.

Arı, A. (2014). Teacher opinions about evaluation of 6th grade English lesson curriculum in primary schools. *Journal of Theoretical Educational Science, 7*(2), 172-194.

Aykanat Erdem, A., Balcı, T., & Duran Özdil, K. (2019). *Ortaokul ve imam hatip ortaokulu İngilizce 7 ders kitabı*. Ankara: Milli Eğitim Bakanlığı Yayınları.

Cartens, D. (2016). The Anthropocene crisis and higher education: A fundamental shift. *South African Journal of Higher Education, 30*(3), 255-273.

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). Thousand Oaks: Sage Publications Inc.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative Inquiry & Research Design: Choosing among Five Approaches* (4th ed.). Thousand Oaks: Sage Publications Inc.

Crutzen, P. J. (2006a). The "Anthropocene". In E. Ehlers, & T. Krafft (Eds.), *Earth System Science in the Anthropocene* (pp. 13-18). Springer.

Crutzen, P. J. (2006b). *The Anthropocene: The Current Human-Dominated Geological Era*. Retrieved from http://www.pas.va/content/dam/accademia/pdf/acta18/acta18-crutzen.pdf

Demircan, F., Akıskalı, G., Berket, A., & Günay, F. (2019). *Ortaokul ve imam hatip ortaokulu İngilizce 6 ders kitabı*. Ankara: Milli Eğitim Bakanlığı Yayınları.

Demirtaş, Z., & Erdem, S. (2015). 5. sınıf İngilizce dersi öğretim programı: Güncellenen programın bir önceki programla karşılaştırılması ve programa ilişkin öğretmen görüşleri. *Sakarya University Journal of Education, 5*(2), 55-80.

Dinçer, A., & Koç, H. K. (2020). The implementation of an intensive English language program in the fifth grade in Turkey: A qualitative evaluation. *Journal of Theoretical Educational Research, 13*(1), 25-43.

Dinçer, B., & Saracaloğlu, A. S. (2017). 7. sınıf İngilizce öğretim programının Stufflebeam'in bağlam-girdi-süreç-ürün (Cipp) modeline göre değerlendirilmesi. *Qualitative Studies (NWSAQS), 12*(2), 1-24.

Gilbert, J. (2016). Transforming science education for the Anthropocene – is it possible? *Research in Science Education, 46*, 187-201.

Goulah, J. (2018). Religion, "the religious," and language education into the Anthropocene: A response to Huamei Han's "Studying religion and language teaching and learning: Building a subfield." *The Modern Language Journal, 102,* 451-455.

Gray, D., & Colucci-Gray, L. (2014). Globalisation and the Anthropocene: The reconfiguration of science education for a sustainable future. *Sisyphus Journal of Education, 2*(3), 14-31.

İlter, B., İzgi, İ., Çavuşer Özdemir, E., Türkeri Yeter, A., & Çavuşer Yünlü, Z. T. (2019). *Mastermind ortaokul ve imam hatip ortaokulu İngilizce 8 ders kitabı*. Ankara: Milli Eğitim Bakanlığı Yayınları.

Kozikoğlu, İ. (2014). Ortaokul 7. sınıf İngilizce öğretim programının değerlendirilmesi. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi, 14*(1), 361-375.

Leinfelder, R. (2013). Anthropocene: Envisioning the future age of humans. *RCC Perspectives, 3*, 9-28.

Lewis, S. L., & Maslin, M. A. (2015). Defining the Anthropocene. *Nature, 519*, 171-180.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage Publications.

Mahaffy, P. G. (2014). Telling time: Chemistry education in the Anthropocene epoch. *Journal of Chemical Education, 91*, 463-465.

Milli Eğitim Bakanlığı. (2018). *İngilizce dersi öğretim programı (ilkokul ve ortaokul 1, 2, 3, 4, 5, 6, 7 ve 8. sınıflar)*. Retrieved from http://mufredat. meb.gov.tr/Dosyalar/201812411191321-%C4%B0NG%C4%B0L%C4%B0ZCE %20%C3%96%C4%9ERET%C4%B0M%20PROGRAMI%20Klas%C3%B6r%C3 %BC.pdf

Ordem, E., & Ulum, Ö. G. (2020). Gender issues in English language teaching: Views from Turkey. *Acta Educationis Generalis, 10*(1), 25-39. https://doi.org/10.2478/atd-2020-0002

Pawson, E. (2015). What sort of geographical education for the Anthropocene? *Geographical Research, 53*(3), 306-312.

Prádanos, L. I. (2015). La enseñanza del español en la era del antropoceno: Hacia la integración de la sostenibilidad en las clases de español como lengua extranjera. *Hispania, 98*(2), 333-345.

Somerville, M. (2017). The Anthropocene's call to educational research. In K. Malone, S. Truong, & T. Gray (Eds.), *Reimagining sustainability in precarious times* (pp. 17-28). Springer.

Steffen, W., Grinevald, J., Crutzen, P., & McNeill, J. (2011). The Anthropocene: Conceptual and historical perspectives. *Philosophical Transactions of the Royal Society A, 369*, 842-867.

Sterling, S. (2017). Assuming the future: Repurposing education in a volatile age. In B. Jickling, & S. Sterling (Eds.), *Post-sustainability and environmental education* (pp. 31-45). Palgrave.

Taylor, A. (2017). Beyond stewardship: Common world pedagogies for the Anthropocene. *Environmental Eduction Research, 23*(10), 1448-1461.

Wagler, R. (2011). The Anthropocene mass extinction: An emerging curriculum theme for science educators. *The American Biology Teacher, 73*(2), 78-83.

Yalçın, M., Genç, G., Orhon, N. Ö., & Şahin, H. (2019). *Ortaokul ve imam hatip ortaokulu İngilizce 5 ders kitabı*. Ankara: Milli Eğitim Bakanlığı Yayınları.

Yıldırım, A., & Şimşek, H. (2013). *Sosyal bilimlerde nitel araştırma yöntemleri* (9th ed.). Ankara: Seçkin Yayıncılık.

Yücel, E., Dimici, K., Yıldız, B., & Bümen, N. T. (2017). Son 15 yılda yayımlanan ilk ve ortaöğretim İngilizce dersi öğretim programları üzerine bir analiz. *Ege Eğitim Dergisi, 18*(2), 702-737.

Zalasiewicz, J., Williams, M., Haywood, A., & Ellis, M. (2011). The Anthropocene: A new epoch of geological time? *Philosophical Transactions of the Royal Society A, 369*, 835-841.

Zalasiewicz, J., Williams, M., Steffen, W., & Crutzen, P. (2011). The new world of the Anthropocene. *Environmental Science & Technology, 44*, 2228-2231.

Fairness in Resource Distribution: Relationship between Children's Moral Reasoning and Logical Reasoning

Derya Can - Veli Can[*]

Abstract:
Introduction: The aim of this study is to examine children's moral reasoning and logical reasoning processes and the relationship between these two mechanisms. In the present study the focus is on the relationship between the factors such as fair sharing, equality, merit, ownership, opportunity in the resource allocation and logical reasoning among the children aged 5-7.
Methods: In this study, which aims to examine how the logical thinking skills differ according to the children's moral reasoning process, a survey design approach was used. Participants were 92 children aged 5 (female N=13, male N=14) and aged 6 (female N=17, male N=18), aged 7 (female N=17, male N=13). The data collected from the moral and logical reasoning tasks were analyzed in two steps. At the first step the answers of the participants were scored. At the second step their justifications were categorized. To test out hypotheses we used two general linear models to examine the age effects of Age (5-7 years) and Reasoning (equality, ownership, merit, opportunity) on children's evaluations of the vignette characters' actions. Age-related changes in children's evaluation and their logical reasoning skills related to initial distribution and transfer status were analyzed by the variance analysis.
Results: Based on the findings of the study it can be stated that the children in the age group of 6-7 evaluated negatively the reward distribution based on the outcomes due to their concerns about the inequality in the opportunities and the violation of the principle of equality. The findings of the study indicate that there is no significant difference in children's logical thinking skills depending on their age. As a result of the study, it is found that although there is no direct relationship between the moral and logical reasoning processes of children, the children who can reject the AC type inference predominantly emphasize the principle of equality. Although there is no significant relationship between moral reasoning and logical reasoning processes, it can be said

---

[*] Derya Can, Mehmet Akif Ersoy University, Faculty of Education, Burdur, Turkey; deryacakmak@mehmetakif.edu.tr
Veli Can, Burdur Anatolia İmam Hatip High School, Burdur, Turkey; okyanuscan15@gmail.com

that children with higher levels of logical reasoning much more frequently emphasize the principle of equality in moral reasoning process.

Discussion: Research indicates that children aged around 5 consider the reward distribution based on the outcomes fair. Older children, on the other hand, evaluate the inequalities in resource distribution as unfair. These findings support the results of the study suggesting that older children consider inequal source distribution both at the first case and at the transfer cases unfair. The children's approval or disapproval of the transfer varies based on their reasoning processes. They support transfer if they emphasize the principle of equality, but they do not support it if their focus is on the principle of ownership. Older children are found to have a commitment to the principle of equality, and the difference between the 5-year age group and the 6-7-year age group is remarkable in this regard. Similar findings are reported in the previous studies, and it is generally stated that younger children are more selfish and that the tendency to distribute resources equally becomes dominant due to the increase in the age of children. Although there is no significant relationship between moral reasoning and logical reasoning processes, it can be said that children with higher levels of logical reasoning emphasize the principle of equality in moral reasoning process much more frequently.

Conclusion: Cognitivists argue that cognition and particularly reasoning have significant roles in making moral decisions. It suggests that children whose logical thinking skills are higher than others understand the necessity of equality to ensure fairness. The basic information on logic should be taught and introduced to the children from an early age. In addition, children should be ensured to use these methods through connections with both daily life and other courses at schools. It is thought that having basic logic knowledge by children will affect positively their cognitive, affective and social development. In order to examine this effect, a logic program including simple logic rules and basic inference types should be developed and the effects of such programs on the cognitive, affective and social development of children should be examined.

Key words: logical reasoning, deductive reasoning, making inferences, moral reasoning, resource allocation, fairness, equality, kindergarten, primary school.

Introduction

Piaget (1932) demonstrated that with the development of the cognitive process that reflects abstract thinking, logical thinking has improved and that provides a basis for supporting moral development. Piaget argues that as a child moves away from egocentrism, moral development begins to take place, and the child's cognitive capacity enables him to distinguish between his ego and the social environment. From the ages 6-7 the child's collaboration with his peers makes

him aware of mutual respect by moving away from egocentric thoughts (Duska & Whelan, 1977; Porubčanová & Pasternáková, 2018). Piaget (1932) argues that children should structure their social and moral intelligence by interacting with their peers. Kohlberg (1976) stated that advanced moral reasoning depends on the logical reasoning ability. Researchers working in the field of cognitive development point out that cognition and especially reasoning play a key role in making moral decisions (Garrigan, Adlam, & Longdon, 2018; Kohlberg, 1976; Piaget, 1932).

In reasoning studies, individuals are given some premises and results and are asked to evaluate the validity of the results. Research indicates that the vast majority of individuals prefer credible results over valid results (Newstead, Pollard, Evans, & Allen, 1992). If a consequent is believable, people tend to accept the result without analyzing the validity of it; but if the consequent is unbelievable they try to find counter examples (Johnson-Laird, 2012) or they analyse the logical structure of the result to find an evidence to reject it (Evans, 2007). Similarly, if intuitive response about moral judgements is not satisfying or analogous to unbelievable and creates negative emotions, individuals tend to think about the situation at hand (Haidt, 2007). However, if the intuitive response is analogous to believable, individuals generally tend to accept it or to expand their justifications over their preference (Haidt, 2001). Therefore, the interaction between beliefs and logic is very important to understand the moral decision making process (Bialek & Terbeck, 2016).

1 Theoretical background

1.1 Fair resource distribution

One of the significant contexts for the concept of fairness is resource allocation (Fehr, Bernhard, & Rockenbach, 2008). Children spend most of their kindergarten and elementary school time by interacting and sometimes discussing issues such as toy sharing and resource allocation. Therefore, resource allocation is very important to understand children's moral development and reasoning processes (Piaget, 1932; Smetana, Jambon, & Ball, 2014). Children understand the importance of equal distribution from early childhood. Over time, they begin to consider the merits or ownerships when determining the fairness in resource allocation (Baumard, Mascaro, & Chevallier, 2012; Blake & McAuliffe, 2011; Fehr et. al., 2008; Li, Spitzer, & Olson, 2014). At around age 2 children employ the ownership rights and defend their belongings (for instance, they say "it is mine.") (Hay & Ross, 1992; Ross, 2012). However, although they are aware of their ownership rights, they are not aware of others' rights (Rossano, Rakoczy, &Tomasello, 2011). From age 3 they begin to be aware of others' rights, and for instance, they may want to stop a puppet trying to steal someone else's stuff (Rossano, Rakoczy, & Tomasello, 2011). Children at around 3-4 age take the side of the object owner when ownership discussions

occur. For example, when a girl who wants to prepare a card for her mother uses a boy's pen, the boy asked the girl to leave the pen. During the period between the ages 3 and 7 when the children are asked how such discussions are settled, majority of them defended the boy who was the owner of the pen (Kim & Kalish, 2009). Children aged 4 think that their belongings can be used by others, but they cannot use the belongings of others without permission (Neary & Friedman, 2014). At around ages 5-6 children distribute some objects such as candies or stickers based on the attempts or the outcomes of others (Noh, D'Esterre, & Killen, 2019; Schmidt, Svetlova, Johe, & Tomasello, 2016; Smith & Warneken, 2016). At around ages 5-7 children do not find it appropriate for others to receive rewards based on the outcomes they produce in unequal conditions and therefore, they advocate equality (Elenbaas, 2019). Research indicates that as children age increases, they tend to correct inequalities which they observe in unfair practices (Fehr, Bernhard, & Rockenbach, 2008; Kogut, 2012). The period of the early years of formal education is very significant for children to develop reasoning about merit, equity, equality and ownership (Conry-Murray, 2015; Noh et al., 2019; Rizzo & Killen, 2016). In this period, children can think about ownership in sharing activities in their daily life (i.e. Nancekivell & Fridman, 2017), and they may distribute their toys or stickers which are considered to be the rewards based on the merits (i.e. Schmidt et al., 2016). In addition, they may recognize the inequal practices in fair and unfair situations (i.e. Rizzo, Elenbaas, & Vanderbilt, 2020). Therefore, it is important to examine how children between the ages of 5 and 7 are able to carry out moral reasoning and what they give priority to concepts such as equality, merit, and ownership.

1.2 Logical reasoning

Piaget argued that deductive reasoning is one of higher cognitive skills which begins to develop during the adult years. However, research findings do not completely support this hypothesis of Piaget. Because there are findings suggesting that high school students cannot manage to make reasoning using the standard logical rules (i.e. Evans, 1982). On the other hand, some findings indicate that primary and secondary school students are able to use conditional reasoning (Kodroff & Roberge, 1975; Moshman, 2004).

Conditional reasoning is one of the most frequently analysed components of deductive reasoning. It has the form of "if P then Q". The second antecedent supports or rejects either the antecedent-P or the consequent-Q. It produces four inference types. One of them is called "Modus ponens" (MP) and has the form of "If P then Q. P is true." and gives the result of "Q is true." The second type is called "Modus tollens" (MT) and has the form of "If P then Q. Q is false." and gives the result of "P is false." The third type is "Affirmation of consequent" (AC). It has the form of "If P then Q. Q is true." which produces illogically valid result of "P is true." The last type of inference is called "Denial of the

antecedent" (DA) and has the form of "If P then Q. P is false." which gives an invalid result of "Q is false."

There is limited number of studies on conditional reasoning skills of young children (Chantel & Markovits, 2017). Some findings suggest that these children are able to do the MP inferences or those inferences which require the form of "All P are Q. R is P. Therefore R is Q." (Dias & Harris, 1988). However, young children experience some difficulties when they try to make MP inferences with premises that they cannot believe in reality (Dias & Harris, 1988). It is also reported that young children tend to accept invalid results in the AC type inferences (O'Brien & Overton, 1982). However, findings also indicate that young children reject the AC inferences if these inferences are given in appropriate contexts (Markovits, 2000; Markovits & Thompson, 2008). On the other hand, logical thinking is thought to be an algorithmic and rules-based procedure (Braine & O'Brien, 1991). This shows that young children who know some basic rules can also make deductive inferences. In addition, it seems that the ability of children to think of alternative situations not included in the premises and to produce them in the process of reasoning plays an important role in rejecting the AC type inferences (Chantel & Markovits, 2017).

1.3 Significance of the study

Research suggests that factors such as working memory, abstract thinking, reasoning and attention skills play an important role in moral reasoning development (Steinbeis, 2018; Sebastian-Enesco & Warneken, 2015). However, the number of studies about such topics is limited (Garrigan, Adlam, & Longdon, 2018). In the present study the focus is on the relationship between the factors such as fair sharing, equality, merit, ownership, opportunity, outcome in the resource allocation and logical reasoning among the children aged 5-7. The social domain theory assumes that fairness is an essential moral element which is taken into consideration by adults and children and that children's understanding of fairness occurs in early childhood (Turiel, 2002). Recent studies suggest that various cognitive processes, including reasoning and justifications are significant components of the moral development (Nucci & Turiel, 2009; Wainryb, Brehl, Matwin, Sokol, & Hammond, 2005). In this context, it is thought that analyzing children's logical and moral reasoning processes and their relationship with each other will contribute to literature.

1.4 Aim of the study

The aim of this study is to examine children's moral reasoning and logical reasoning processes and the relationship between these two mechanisms. In the logical thinking process, based on the premises given, the skills of making correct inferences were examined and the reasons on which they based their inferences were determined. In the moral reasoning process, it is aimed to examine children's judgments and justifications in the distribution of existing

resources by making use of the tasks that include equality and inequality regarding resource distribution.

Research begins with the assumption that children's logical reasoning skills will improve depending on the increase in age and that these children will emphasize the principle of equality in resource allocation more. In other words, as the age of the children increases, it is thought that their logical thinking skill and their commitment to the principle of equality will increase. In this context, the following hypotheses are developed regarding the moral and logical reasoning process:

Hypothesis 1: Children who reason based on the merit evaluate the first distribution more positively than children who emphasize opportunity or inequality.

Hypothesis 2: Children who emphasize the merit or ownership categories in their moral reasoning evaluate the transfer of resources more negatively than children who emphasize the opportunity or equality.

Hypothesis 3: Children who accept the MP inference refer to more of the main premise, while children who reject the AC inference refer to more of the alternative premise.

Hypothesis 4: Based on the increase in children's ages, logical thinking skills develop, and children with higher logical thinking skills put more emphasis on equality in the moral reasoning process.

Hypothesis 5: Children with higher logical thinking skills evaluate the distribution of rewards and transfer from one recipient to another more negatively in order to eliminate reward distribution based on the outcomes and the inequality of opportunity.

2 Methods

In this study, which aims to examine how the logical thinking skills differ according to the moral reasoning, a survey design approach was used. In studies using such survey design approach, the opinions of the participants are identified, described and the current situation is tried to be revealed (Fraenkel, Wallen, & Hyun, 2012).

2.1 Participants

Participants were 92 children aged 5 (female N=13, male N=14) and aged 6 (female N=17, male N=18), aged 7 (female N=17, male N=13). They were approximately evenly divided in terms of age and gender. Therefore, the participants were from 5-7 year-old children (N=92; MAge = 6,8, SD=9 months) enrolled in pre-kindergarten, kindergarten, or first grade at two public elementary schools in a small scale city in the south of Turkey.

2.2 Procedure

Parental consents and children's verbal consents were obtained for all participants. The children were individually interviewed by first author in a quiet room at their schools in the spring semester of 2018-2019 school year.

2.3 Measures

Moral reasoning task

In order to analyze the moral reasoning skills of the participants a vignette was employed which is contained in the study by Elenbaas (2019). It covers the events in a park during the Art Day. Following the vignette the children are asked to express their views about how the resource distribution should be done taking into account the factors such as the outcomes, attempts, opportunities and inequalities in opportunities. Main characters in the vignette are those children who are primary school students having unisex names. Sample of the vignette are given as follows:

During the art day children are given a candy for every picture that they color. They are given many papers to paint. However, they should have brought their crayons from homes. It takes a whole crayon just to color one page. There are two children who brought crayons from home. Look! It is A's crayon. A has one 1 crayon. Look! These are B's crayons. B has five crayons. Both children painted the papers. As mentioned "a crayon can paint only one paper." Then, A could paint one paper and B could paint five papers. The child at the park who is responsible for giving candies to the children (character C) sees that A brought one crayon and painted one paper, and B brought five crayons and pained five papers. C takes six candies to give the characters A and B. He gives one candy to A and give five candies to B.

The participants were asked to evaluate the potential of having rewards (candies) taking into consideration their outcomes (painted papers) and their opportunities (the crayons the children have). This vignette was developed (Elenbaas, 2019) in order to understand that the participants are aware of the inequal opportunities in the situation occurred as a result of the fact that A brought one crayon and B brought five crayons. In addition, the character C distributed the rewards based on the outcomes of the character A and character B.

Evaluation: first distribution

The participants were asked to evaluate the act of the character C and to give an answer using one of the smiley/frowny face likert type scale (face 1=not okay, face 2=undecided, face 3=okay). Then, the justification for their answer was asked and children's answers were recorded.

The study goes on as follows:

The children put the candies in their bags. Another child comes to the park (the fourth character-D). The character D saw that the character A brought one crayon and painted one paper and took one candy and that the character B

brought five crayons and painted five papers and took five candies. The character D takes two candies from the B's bags and put them into A's bag.

Evaluation: transfer

Transfer is defined as the situation of taking a few candies from those who have more candies and giving them to the others. The children are asked whether or not the behaviour of the character D is appropriate. They are asked to indicate their response using both smiley/frowny face likert type scale (face 1= not okay, 2=undecided and 3=okay) and verbal expressions. Then, they are asked to justify their responses, and these justification statements are recorded.

Logical reasoning task

The logical reasoning skills of the participants were analyzed through five problem statements which included the MP and AC type inferences. These problem statements were developed based on the studies carried out with samples of younger children (Chantel & Markovits, 2017; Markovits, 2000; Markovits, Venet, Janveau-Brennan, Malfait, Pion, & Vadeboncoeur, 1996). The children are asked to evaluate the AC and MP inferences and to justify their responses. The problem statements were reviewed by a field expert and were used in a pilot study. In each problem set the participants were asked to evaluate first the AC type inference and then the MP inference. In addition, the participants were asked to justify their answers to these problem statements. Sample of the problem statements are given as follows:

1. All dogs have legs.
    a. (AC) A friend of mine has an animal with legs. Is it certain that it is a dog? Why?
    b. (MP) A friend of mine saw a dog. Is it certain that this dog has legs? Why?
2. All cars have wheels.
    a. (AC) A friend of mine saw a vehicle with wheels. Is it certain that this vehicle is a car? Why?
    b. (MP) A friend of mine saw a car. Is it certain that that car has wheels? Why?
3. All flies can fly.
    a. (AC) A friend of mine saw an insect which can fly. Is it certain that this insect is a fly? Why?
    b. (MP) Another friend of mine saw a fly. Is it certain that this fly can fly? Why?
4. All boots are worn on the feet.
    a. (AC) A friend of mine saw a thing that is worn on the foot. Is it certain that this thing is a boot?
    b. (MP) Another friend of mine saw a boot. Is it certain that this boot is worn on the foot?

5. All trucks have wheels.
   a. (AC) A friend of mine saw a vehicle with wheels. Is it certain that this vehicle is a truck? Why?
   b. (MP) Another friend of mine saw a car. Is it certain that this truck has wheels? Why?

2.4 Data analysis

The data collected from the moral and logical reasoning tasks were analyzed in two steps. At the first step the answers of the participants were scored. At the second step their justifications were categorized. To test out hypotheses we used two general linear models to examine the age effects of Age (5-7 years) and Reasoning (equality, ownership, merit, opportunity) on children's evaluations of the vignette characters' actions (initial distribution and transfer, both from 1= "not okay" to 3="okay"). Comparisons of model fit were made using the maximum likelihood estimation; restricted maximum likelihood estimation was used to interpret parameter estimates. The chi-square analysis was conducted to examine the relationship between inference and justification types. Age-related changes in children's assessment and their logical thinking skills related to initial distribution and transfer status were analyzed by the variance analysis.

Moral reasoning task

Moral reasoning task was evaluated based on the acts of both the character C and the character D. If the participants found their acts proper they were given 1. If they considered these acts as improper, then they were given 0. In addition, the participants were asked to express their views about both characters using one of three faces. In addition, the participants were asked to justify their answers to these problem statements.

Coding the justifications for the moral reasoning

The coding of the participants' justifications for the moral reasoning was carried out based on the studies (Elenbaas, 2019) which is given in Table 1. The answers which provided no justification are categorized as "other." If the children have expressed opinions that are suitable for more than one category, the coding was done based on their dominant reasoning category. Coding was carried out by two raters and the inter coder coefficient is found to be Cohen's κ= .89.

Table 1

Codes about the moral reasoning process

Category	Description	Examples
Equality	Equalization of resources and avoiding inequality.	"Now both are the same." "One of them has one candy and the

		other has five candies. It is not fair."
Ownership	Emphasis on ownership and ownership rights.	"These candies belong to B. We cannot take them from his bags."
		"These candies belong to him."
Merit	Emphasis on the concept of right as a requirement of output and effort.	"He painted more paper, so he deserves more candies."
		"A painted only one paper, so why cannot B take more candies."
		"It is well done. Because A did not have more crayons."
Opportunity	Emphasis on the opportunities that characters have in the context of the story.	"A could not paint five papers. Because he did not have five crayons. Why does not A take five candies!"

Logical reasoning task

In problems related to the logical thinking one point is given if children give logically correct answers to both types of inference. If they respond incorrectly to either or both of the inference types, they were given zero. It is expected from children to reject the result of the AC type inferences in each set of problems and to accept the result of the MP type inference. In this case, the logical thinking score of the children may change between the scores of 0-5.

How the children participated in the study justified their results about the inferences and their acceptance and rejection were examined. In the studies the following four categories are employed in this regard: a) References to the first premise (for instance, when an antecedent like "All dogs have four legs." is given children provides such explanations as "Dogs have legs." or "Because it is a dog."), b) References to a specific or an alternative premise (for instance, "Because cats also have legs." or "all other animals have legs.") c) anecdotes (for instance, "Because I have a dog.") d) I do not know.

These four categories developed in the study by Chantel and Markovits (2017) were used in the study. However, in the study the participants were found to make references to the first antecedent, but told irrelevant statements. For instance, in the problem set which included an antecedent premise such as "All boots are worn on the feet." one of the participants provided the following irrelevant justification: "Because the boot is worn while fishing." Therefore, those answers which make a reference to the main antecedent premise, but contain an irrelevant justification are grouped in a different category.

3   Results

Moral reasoning - initial distribution

Table 2 indicates the views of the participants about the appropriateness of the behaviours of the character C and their justifications for the answers. As can be seen in Table 2, 75% of the participants did not consider as proper the distribution of the rewards (candies) based on the outcomes (the number of

papers painted) without having equal opportunity (crayons) (n=69). Their justifications are mainly based on the assumption that equality is not provided in such a case (83%). 15% of the students reported that such a reward distribution is proper (n=23). 78% of them justified their answer using the concept of deserving this right. More specifically, they argued that B deserves more candies due to the fact that he painted more papers. This finding supports the hypothesis of the study that children who take into the merit in their evaluation will evaluate the first distribution more positively than children who take into consideration the opportunity or inequality, LR χ^2 (3, N=98) = 74.222, p<.001. Those children who attach importance to the merit (M=2.89, SE=0.32) are found to have much more positive views about the first distribution in contrast to the children who consider the equality (M=1.35, SE=0.61) or the opportunity (M=1, SE=0) much more significant in their evaluation process, F (3. 91)=32.430, p<.001.

Table 2

Views of the participants about the behaviours of the character C

	Equality		Merit		Opportunity		Others	
	n	%	n	%	n	%	n	%
Not okay	57	82.6	0	0	2	2.9	10	14.5
Okay	0	0	18	78.3	0	0	5	21.7

Moral reasoning - transfer
Table 3 indicates the views of the participants about the appropriateness of the behaviours of the character D and their justifications for the answers. It is found that 58% of the participants regarded the act of the character D as proper. In other words, they considered the behaviour of the character D who took some candies of the character B and gave them to the character A who was in an inequal situation, as proper. Because the character A had less crayons. However, majority of these children (70%) thought that these candies belong to the character B based on the concept of "ownership" and therefore, the character D cannot take the candies. On the other hand, 17% of these students emphasized the concept of merit. In other words, they argued that the character B deserves all these candies due to the fact that he painted more papers, and therefore, for them the act of the character D is not proper. However, 42% of the students (n=39) regarded the act of the character D as proper. Our hypothesis in this regard is that children who emphasize merit or ownership categories will evaluate the transfer of resources more negatively than children who emphasize the opportunity or equality. Therefore, this hypothesis is supported by the findings. In other words, the model suggesting that children will have positive views about the fact that the first distribution should be modified in order to eliminate the inequality of opportunity is found to be meaningful, LR $\chi2$ (3, N=98)=88.008, p < .001. The justifications that children expressed in the process

of reasoning differ significantly based on their reactions concerning the transfer, F (3, 91)=33.175, p<.001. Children who reasoned based on the concept of ownership (M=1.35, SE=0.88) evaluated this resource transfer more negatively than children who reasoned focusing on the concept of equality (M=2.72 SE=0.599) and the concept of merit (M=2.11, SE=0.782), all p<.01. The evaluations of children who reasoned focusing on the concepts of equality, merit and opportunity did not differ significantly from each other, p>.05.

Table 3

Views of the participants about the behaviours of the character D

	Equality		Merit		Opportunity		Others	
	n	%	n	%	n	%	n	%
Not okay	1	1.9	37	69.8	9	17	6	11.3
Okay	39	100	0	0	0	0	0	0

Logical reasoning

Logical reasoning items contain both the MP type and the AC type inferences. If the participants answered correctly in both types they were given 1. If their answers were incorrect, they were given 0. Therefore, their scores might have ranged between 0 and 5. It is found that there are only five students who accepted the result of the MP type inference, rejected the AC type inference (5%). The mean score for the MP type inferences (M=4.8, SD=0.63) is found to be higher than that of the AC type inferences (M=0.90, SD=1.49). In short, they tend to accept both MP and AC types inferences.

It is also found that 54% of the participants' justifications make references to the first or main premises whereas 16% of them make references to the alternative (specific or general) premises (Table 4). The rate of the participants who used anecdotes to justify their answers is found to be 0.32%. The rate of the participants who did not provide any justification, but said "I do not know." is found to be 11.19%. The rate of the participants who referring to an anectodal stories about the main premises, but did not provide a proper justification is found to be 14.56%. The answers of 4% of the students cannot be categorized. In addition to these last two categories there are some students who said "I do not know." instead of giving justification. In short, nearly 30% of the participants did not provide any justification for their answers. It is further found that 62% of the justifications for the MP type inferences and 46% of the justifications for the AC type inferences make references to the main premises. The rate of the references to the alternative premises in the AC type inferences is 30% while it is nearly 8% in the MP type inferences. The participants' justifications for the AC and MP type inferences differ in terms of the first and second categories.

As stated above the relationship between the inference types and justification types is examined through the chi-square analysis. Their justifications were

analysed based on three categories. Of them the first two categories include the references to the main premise and the references to the alternative premises, respectively. The third category includes the total of the other four categories. The results of the analysis indicate that there is a significant correlation between the participants' rejection of the AC type inferences and their justifications, χ^2 (2, N=460)=44.565 p<.001. However, such a significant correlation is not found between their acceptance of the MP type inferences and their justifications, χ^2 (2, N=460)=15.471 p>.05. It is also found that the participants mostly produce the justifications for the MP type inferences making references for the first premises rather than for the AC type inferences. In regard to the AC type inferences their justifications are mostly based on the alternative premises. This result supports one of our hypothesis (H3).

Table 4

Justifications of the participants

Inference types	Categories for justifications*										
	1		2		3		4		5		6
	n	%	n	%	n	%	n	%	n	%	n	%
AC inferences	210	45.6	110	29.91	0	0	52	11.30	70	15.21	18	3.91
MP inferences	287	62.39	35	7.60	3	0.65	51	11.08	64	13.91	20	4.34
Total	497	54	145	15.7	3	0.32	103	11.19	134	14.56	38	4.13

* Justifications indicating the categories are given with their numbers as follows: 1. Those which make references to the main premise. 2. Those which make references to the alternative premises (specific or general). 3. Those in which anecdotes are employed. 4. Those who said "I do not know." 5. Those which make references to the main premise, but do not provide any justification. 6. Those justifications which cannot be categorized.

Table 5 presents the percentage and frequency of the justifications of the participants concerning the AC type inferences. When the AC type inference is rejected (correct answer), 9.6% of the participants' justifications are the references to the main premises whereas 74.6% of them to the alternative premises. When the AC type inference is accepted (incorrect answer), 7.95% of the participants produced the justifications which make reference to the alternative premises. Among those students whose answer was incorrect the rate of the participants whose justifications make a reference to the main premise is 22.28%. Nearly the same rate of the students produced the justifications which contain references to the first premises, but these justifications were just anecdotes (22.01%). In other words, there is a parallelism between the rejection of the AC type inferences (respond correctly) and the justifications which made references to the alternative premises. This is an indication that those children with advanced logical reasoning can think of other alternatives instead of only thinking about the given situation.

Table 5

Justifications of the participants for the acceptance or rejection of the AC type inferences

Item number	Correct (1)/ Incorrect(0)	Categories for justifications*											Total
		1		2		3		4		5		6		
		n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*
1	0	38	53.5	8	11.3	0	0	16	22.5	7	9.9	2	2.8	71
	1	1	4.8	12	57.1	0	0	6	28.6	1	4.8	1	4.8	21
2	0	52	69.3	2	2.7	0	0	7	9.3	11	14.7	3	4	75
	1	5	29.4	11	64.7	0	0	1	5.9	0	0	0	0	17
3	0	48	64	12	16	0	0	5	6.7	7	9.3	3	4	75
	1	1	5.9	14	82.4	0	0	2	11.8	0	0	0	0	17
4	0	26	34.7	16	21.3	0	0	7	9.3	20	26.7	6	8	75
	1	0	0	16	94	0	0	0	0	0	0	1	5.9	17
5	0	38	46.9	10	12.3	0	0	8	9.9	23	28.4	2	2.5	81
	1	1	9.1	9	81.8	0	0	0	0	1	9.1	0	0	11

* Justifications indicating the categories are given with their numbers as follows:
1. Those which make references to the main premise. 2. Those which make references to the alternative premises (specific or general). 3. Those in which anecdotes are employed. 4. Those who said "I do not know." 5. Those that are related to the main premise, but do not provide any justification. 6. Those justifications which cannot be categorized.

Logical reasoning, moral reasoning, age
The participants were expected to advocate the principle of equality due to the increase in their ages. It was also thought that depending increase in their age they did not find the distribution of rewards appropriate and to approve the transfer from one recipient to another to eliminate the inequal opportunity. It was examined whether there is a meaningful difference in the situation of finding the first distribution appropriate for the participants based on their age. The analysis results show that children aged 5 considered the distribution of the rewards based on the outcomes much more positively in contrast to those children aged 6 and aged 7, F (2, 91)=3.425, p<.05. It is also found that the acceptance of the children aged 6 or 7 in regard to the reward distribution based on the outcomes is less common in contrast to the children aged 5. The children's approval of the transfer does not significantly differ depending on age, F (2, 91)=1.469, p>.05. However, the approval of the transfer by the children aged 6 and aged 7 (for those aged 6; M=2.23, SD=0.843; for those aged 7; M=2.10, SD=0.885) is more common than that of the children aged 5 (M=1,85, SD=0,864). It suggests that older children emphasize the concept of equality much more frequently. Depending on the increase in children's ages, their logical thinking skills, that is, their tendency to accept the MP type inference and to reject the AC inference,

are expected to improve. However, no significant correlation is found between children's logical thinking skills and their age, F (2, 91)=1.040, p>.05.

This study was initiated with the assumption that children with higher-level logical thinking skills will have a higher rate of the approval of the equality principle than the other children. Therefore, the children are expected not to approve the reward distribution based on the outcomes, but to approve the transfer to eliminate the inequality in opportunities. In order to identify the children with high logical thinking skills, their tendency to produce alternative premises was examined using five problem statements which contain the AC type inferences. Because the majority of the participants accepted the MP type inferences and produced correct answers 88%. However, the number of the participants who rejected the AC type inferences is very low. The children should produce the justifications based on the alternative premises in order to reject the AC type inferences. Therefore, those children who could produce three or more justifications based on the alternative premises for the AC type inferences were identified. Higher potential of the participants who produced the justifications based on the alternative premises does not significantly support the hypothesis that they would negatively evaluate the reward distribution based on the outcomes (LR χ2 (2, N=98)=2.286, p>.05) and that they would consider the source transfer positively to eliminate the inequality in opportunities, LR χ2 (2, N=98)=2.285, p>.05). There are thirteen children who produced the justifications depending on the alternative premises for the AC type inferences. However, ten of them did not approve the reward distribution based on the outcomes and they further argued that it violated the principle of equality. According to our hypothesis, those children who can produce the justifications using the alternative premises are expected to emphasize the concept of equality. Given that 76% of the children who rejected the AC type hypotheses and employed the alternative premises supported the principle of equality, the related hypothesis is supported, not significantly.

4   Discussion

Based on the findings of the study it can be stated that those children aged 5 much more supported the reward distribution based on the outcomes in contrast to those in the age group of 6-7. The children in the age group of 6-7 negatively evaluated the reward distribution based on the outcomes due to their concerns about the inequality in the opportunities and the violation of the principle of equality. Research also indicates that children aged around 5 consider the reward distribution based on the outcomes fair (Schmidt et al., 2016). Older children, on the other hand, evaluate the inequalities in resource distribution as unfair (Elenbaas & Killen, 2017; Rizzo, Elenbaas, Vanderbilt, 2020). These findings support the results of the study suggesting that older children consider inequal source distribution both at the first case and at the transfer cases unfair. The children's approval or disapproval of the transfer varies based on their reasoning

processes. They support transfer if they emphasize the principle of equality, but they do not support it if their focus is on the principle of ownership. Elenbaas (2019) also reported similar findings and stated that those children whose justifications are based on either ownership or merit consider transfer more negative than those whose justifications are based on the principle of equality (Elenbaas, 2019).

Conditional (if-then) reasoning is one of the significant components of higher-level thinking processes. In the study the performance of the participants was analysed in relation to the MP and AC inference types. Although the children participated in the study tended to accept the MP type inferences and to provide correct answers, the number of children who rejected the AC type inferences and provided correct answers is found to be very low. In the study by Chantel and Markovits (2017) the rate of the students who correctly answered the MP and AC type of inferences is found to be 27% among the children aged between 41-64 months. In the current study it is found that the rate of responding correctly to both inference types is 5% among the children aged between 50-87 months. Therefore, although older children are included in the sample of the current study, their logical reasoning scores are found to be very low. Although a large number of the participants accepted the MP type inferences and responded correctly, there are very few students who rejected the AC type inferences. As a result the total scores of the children in regard to the logical thinking questions are found to be quite low. Markovits (2000) reported that the rate of rejecting the AC type inferences is much more infrequent among the first grade primary school students in contrast to the second grade primary students. It is also found that it is less common among the second grade primary students in contrast to the fifth grade primary school students. These findings suggest that younger children incorrectly accept the AC inference type (Chantel & Markovits, 2017; Markovits, 2000; O'Brien & Overton, 1982) which support the current findings.

The main purpose of this research is to examine the relationship between children's moral and logical reasoning processes. The study started with the assumption that older children will have higher logical thinking skills and that these children will adhere to the principle of equality. However, the findings of the study indicate that there is no significant difference in children's logical thinking skills depending on their age. On the other hand, older children are found to have a commitment to the principle of equality, and the difference between the 5-year age group and the 6-7-year age group is remarkable in this regard. Similar findings are reported in the previous studies, and it is generally stated that younger children are more selfish and that the tendency to distribute resources equally becomes dominant due to the increase in the age of children (Blake & McAuliffe, 2011; Fehr, Bernhard, & Rockenbach, 2008; Sheskin, Bloom, & Wynn, 2014). Although there is no significant relationship between moral reasoning and logical reasoning processes, it can be said that children with

higher levels of logical reasoning emphasize the principle of equality in moral reasoning process much more frequently. Cognitivists argue that cognition and particularly reasoning have significant roles in making moral decisions. Piaget (1932) stated that logical reasoning develops closely related to the cognitive processes such as abstract reasoning and such a process provides a basis for moral development. Piaget (1932) argued that moral development in children occurs when they move away from egocentrism approach and reach the necessary cognitive capacity to understand the difference between the social environment and their ego. Kohlberg, on the other hand, stated that there is a parallelism between one's moral and logical stages, and stated that higher level of moral reasoning depends on higher level of logical reasoning (Kohlberg, 1984). Gibbs (2013) emphasized the effect of working memory on the development of moral reasoning and mentioned the need for attentional abilities in order to see maturation in moral reasoning process. Attentional abilities require considering the multiple dimensions of a situation and moving away from the egocentric tendency (Gibbs, 2014). In addition to emphasizing the effects of many social and affective factors in moral development, a group of researchers emphasized the importance of cognitive features such as working memory, attention, abstract reasoning and logical reasoning (Gibbs, 2014; Hoffman, 2000; Piaget, 1932). As a result of the study, it is found that although there is no direct relationship between the moral and logical reasoning processes of children, the children who can reject the AC type inference predominantly emphasize the principle of equality. It is necessary for children to be able to produce the alternative premises to reject AC inference. For instance, when the children are given a premise like "All dogs have legs." and a question like "I have an animal with legs. Is it certain that it is a dog?" children may give the answer of "it is not certain." if they can think about the other animals with legs. Although there were very few children who could do this, nearly 75% of them emphasized the principle of equality during the moral reasoning process. It suggests that children whose logical thinking skills are higher than others understand the necessity of equality to ensure fairness.

Conclusions

The basic information on logic should be taught and the principles of reasoning should be introduced to the children from an early age. In addition, children should be ensured to use these methods through connections with both daily life and other courses at schools. It is thought that having basic logic knowledge by children will positively affect their cognitive, affective and social development. In order to examine this effect, a logic program including simple logic rules and basic inference types should be developed and the effects of such programs on the cognitive, affective and social development of children should be examined.

References

Baumard, N., Mascaro, O., & Chevallier, C. (2012). Preschoolers are able to take merit into account when distributing goods. *Developmental Psychology, 48*, 492-498. http://doi.org/10.1037/a0026598

Białek, M., Handley, S. J., & Terbeck, S. (2016). *Moral Versus Mathematical Reflection Effects on Moral Judgments.* Kozminski University Working Paper.

Blake, P. R., & McAuliffe, K. (2011). "I had so much it didn't seem fair": Eight-year-olds reject two forms of inequity. *Cognition, 120*(2), 215-224. http://doi.org/10.1016/j.cognition.2011.04.006

Braine, M. D. S., & O'Brien, D. P. (1991). A theory of if: A lexical entry, reasoning program, and pragmatic principles. *Psychological Review, 98*(2), 182-203. http://doi.org/10.1037/0033295X.98.2.182

Chantel, P. L., & Markovits, H. (2017). The capacity to generate alternative ideas is more important than inhibition for logical reasoning in preschool-age children. *Memory & Cognition, 45,* 208-220.

Conry-Murray, C. (2015). Boys get the math games and girls get the reading games: Children's reasoning about distributive justice and gender. *Merrill-Palmer Quarterly*, *61*, 319-344. https://doi.org/10.13110/merrpalmquar1982.61.3.0319

Dias, M. G., & Harris, P. L. (1988). The effect of make-believe play on deductive reasoning. *British Journal of Developmental Psychology, 6*, 207-221.

Duska, R., & Whelan, M. (1977). Moral Development: A Guide to Piaget and Kohlberg. Dublin: Gill and Macmillan.

Elenbaas, L. (2019). Young children's reasoning about equality and ownership in resource conflicts. *Cognitive Development, 52*, 1-8.

Elenbaas, L., & Killen, M. (2017). Children's perceptions of social resource inequality. *Journal of Applied Developmental Psychology, 48,* 49-58. http://dx.doi.org/10.1016/j.appdev.2016.11.006

Evans, C. S. (1982). Moral stage development and knowledge of Kohlberg's theory. *Journal of Experimental Education, 51*, 14-17.

Evans, J. S. B. (2007). On the resolution of conflict in dual process theories of reasoning. *Think Reason, 13,* 321-339.

Fehr, E., Bernhard, H., & Rockenbach, B. (2008). Egalitarianism in young children. *Nature, 454*, 1079-1083.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to Design and Evaluate Research in Education.* (8th ed). New York: McGraw-Hill.

Garrigan, B., Adlam, A. L. R., & Langdon, P. E. (2018). Moral decision-making and moral development: Toward an integrative framework. *Developmental Review, 49,* 80-100. https://doi.org/10.1016/j.dr.2018.06.001

Gibbs, J. C. (2014). *Moral Development and Reality: Beyond the Theories of Kohlberg, Hoffman, and Haidt* (3rd ed.). Oxford University Press.

Johnson-Laird, P. N. (2012) *Inference with mental models.* In K. Holyoak, & R. Morisson (Eds.), *The Oxford Handbook of Thinking and Reasoning* (pp. 134-145)*.* London: Oxford University Press.

Haidt, J. (2001). The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychological Review, 108*, 814.

Haidt, J. (2007). The new synthesis in moral psychology. *Science, 316*, 998-1002.

Hoffman, M. (2000). *Empathy and Moral Development. Implications for Justice and Caring.* Cambridge, UK: Cambridge University Press. https://doi.org/10.1017/CBO9780511805851.003

Li, V., Spitzer, B., & Olson, K. R. (2014). Preschoolers reduce inequality while favoring individuals with more. *Child Development, 85*(3), 1123-1133. http://doi.org/10.1111/cdev.12198

Kim, S., & Kalish, C. W. (2009). Children's ascriptions of property rights with changes of ownership. *Cognitive Development*, *24*(3), 322-336.

Kodroff, J. K., & Roberge, J. J. (1975). Developmental analysis of the conditional reasoning abilities of primary-grade children. *Developmental Psychology, 11*, 21-28.

Kogut, T. (2012). Knowing what I should, doing what I want: From selfishness to inequity aversion in young children's sharing behavior. *Journal of Economic Psychology, 33*, 226-236.

Kohlberg, L. (1976). Moral stages and moralization: The cognitive-developmental approach. In T. Lic- kona (Ed.), *Moral Development and Behavior: Theory, Research, and Social Issues.* New York: Holt, Rinehart & Winston.

Markovits, H. (2000). A mental model analysis of young children's conditional reasoning with meaningful premises. *Thinking & Reasoning, 6*(4), 335-347.

Markovits, H., & Thompson, V. (2008). Different developmental patterns of simple deductive and probabilistic inferential reasoning. *Memory & Cognition, 36*(6), 1066-1078. https://doi.org/10.3758/MC.36.6.1066

Markovits, H., Venet, M., Janveau-Brennan, G., Malfait, N., Pion, N., & Vadeboncoeur, I. (1996). Reasoning in young children: Fantasy and information retrieval. *Child Development, 67*(6), 2857-2872. https://doi.org/10.1111/j.1467-8624.1996.tb01892.x

Moshman, D. (2004). False moral identity: Self-serving denial in the maintenance of moral selfconceptions. In D. Lapsley, & D. Narvaez (Eds.), *Morality, Self, and Identity* (pp. 83-109). Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Nancekivell, S. E., & Friedman, O. (2016). "Because it's hers": When preschoolers ue ownership in their explanations. *Cognitive Science, 41*, 827-843.

Neary, K. R., & Friedman, O. (2014). Young children give priority to ownership when judging who should use an object. *Child Development, 85*, 326-337. https://doi.org/10.1111/cdev.12120.

Newstead, S. E., Pollard, P., Evans, J. S. B., & Allen, J. L. (1992). The source of belief bias effects in syllogistic reasoning. *Cognition, 45*, 257-284.

Noh, J., D'Esterre, A., & Killen, M. (2019). Effort or outcome? Children's meritorious decisions. *Journal of Experimental Child Psychology, 178*, 1-14. https://doi.org/10.1016/j.jecp.2018.09.005

Nucci, L., & Turiel, E (2009) Capturing the complexity of moral development and education. *Mind, Brain, and Education*, *3*(3), 151-159.

O'Brien, D. P., & Overton, W. F. (1982). Conditional reasoning and the competence-performance issue: A developmental analysis of a training task. *Journal of Experimental Child Psychology, 34*(2), 274-290. https://doi.org/10.1016/0022-0965(82)90046-7

Piaget, J. (1932). *The moral judgment of the child*. London: Routledge Kegan Paul.

Porubčanová, D., & Pasternáková, L (2018). Influence of socially disadvantaged environment on aggressiveness of pupils at primary schools. *Acta Educationis Generalis, 8*(1), 104-115. https://doi.org/10.2478/atd-2018-0007

Rizzo, M. T., Elenbaas, L., Cooley, S., & Killen, M. (2016). Children's recognition of fairness and others' welfare in a resource allocation task: Age related changes. *Developmental Psychology. 8,* 1307-1317. https://doi.org/10.1037/dev0000134

Rizzo, M. T., Elenbaas, L., & Vanderbilt, K. E. (2020). Do children distinguish between resource inequalities with individual versus structural origins? *Child Development, 91*(2), 439-455.

Rizzo, M. T., & Killen, M. (2016). Children's understanding of equity in the context of inequality. *British Journal of Developmental Psychology, 34,* 569-581. http://dx.doi.org/10.1111/bjdp.12150

Rossano, F., Rakoczy, H., & Tomasello, M. (2011). Young children's understanding of violations of property rights. *Cognition, 121*, 219-227. https://doi.org/10.1016/j.cognition.2011.06.007.

Schmidt, M. F. H, Svetlova, M., Johe, J., & Tomasello, M. (2016). Children's developing understanding of legitimate reasons for allocating resources unequally. *Cognitive Development, 37*, 42-52. https://doi.org/10.1016/j.cogdev.2015.11.001.

Sebastián-Enesco, C., & Warneken, F. (2015). The shadow of the future: 5-year-olds, but not 3-year-olds, adjust their sharing in anticipation of reciprocation. *Journal of Experimental Child Psychology*, *129*, 40-54.

Sheskin, M., Bloom, P., & Wynn, K. (2014). Anti-equality: Social comparison in young children. *Cognition, 130*(2), 152-156.

Smetana, J. G., Jambon, M., & Ball, C. (2014) The social domain approach to children's moral and social judgments. In M. Killen, & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 23-45). New York: Psychology Press.

Smith, C. E., & Warneken, F. (2016). Children's reasoning about distributive and retributive justice across development. *Development Psychology, 52*(4), 613-628.

Steinbeis, N. (2018). Taxing behavioral control diminishes sharing and costly punishment in childhood. *Developmental Science*, *21*(1), e12492.

Turiel, E. (2002). *The Culture of Morality: Social Development, Context, and Conflict*. Cambridge: Cambridge University Press.

Wainryb, C., Brehl, B. A., Matwin, S., Sokol, B. W., & Hammond, S. (2005). Being hurt and hurting others: Children's narrative accounts and moral judgments of their own interpersonal conflict. *Monographs of Society for Research in Child Development, 70*(3), i-122.

Differences and Similarities between Coaching, Instructional and Educational Leadership Styles

Agnė Daučianskaitė - Vilma Žydžiūnaitė[*]

Abstract:
Introduction: Leadership is part of the educational process, nevertheless, it has not been fully surveyed. Successful teaching and good results usually depend on an educator, as well as on the way s/he organizes the educational process. There are a lot of various educators who organize the educational process in a different way. As a result of that, three prevailing leadership styles appear - coaching, instructional and educational. In the scientific literature, it is possible to find a huge amount of information about these three styles, however, little research has been carried on the comparison of differences and similarities between them. Therefore, the purpose of this research is to derive and compare parameters (criteria) in leadership, distinguishing and summarizing their differences and similarities in tables.
Purpose: The purpose of the paper is to compare the particular leadership styles according to formulated original parameters (criteria).
Methods: In the paper, the method of a comparative literature review is applied.
Conclusion: Comparing leadership styles, coaching leadership is focused on helping the learner and the improvement of the educational process; instructional leadership aims for effective and academic teaching when the educator is the leader; while educational leadership is focused on distributing education when the teacher, student and school environment are involved in the educational process.

Key words: coaching leadership, educational leadership, differences, similarities, instructional leadership.

---

[*] Agnė Daučianskaitė, Vytautas Magnus University, Academy of Education, Educational Research Institute, Kaunas, Lithuania; daucianskaite.agne@gmail.com
Vilma Žydžiūnaitė, Vytautas Magnus University, Academy of Education, Educational Research Institute, Kaunas, Lithuania; vilma.zydziunaite@vdu.lt

Introduction

Leadership is important in education, not only influencing the learner's results and the relationship between educator and learner, but also seeking to maintain a good learning atmosphere, develop personality in a broad sense, develop teamwork perspectives, improve the educational process, and strengthen the school leader's and teacher's education. According to Harris (2005), teacher leadership is important for school performance and change, as well as student achievement. Nowadays a plethora of educators use a variety of leadership strategies, but all this is like a hidden form. First, there are educators who help learners to achieve learning results and tend to provide the educational process in a facilitated form. Second, there are teachers who strive to reach learning achievements through rigorous training and respect only their own opinion. Third, there are educators who place more emphasis on both – their own and the student's opinion, allowing them to choose and understand which opinion is more important. As a result, such leadership styles as coaching, instructional and educational emerge. It is coaching leadership that is characterized by help for the learner, learner's confidence in the educator, and a warm relationship with the educator in the learning process, which influence further career success (Berg & Karlsen, 2007; Robertson, 2008). Instructive leadership is characterized by the educator's leadership in the educational process, effective teaching and the pursuit of higher results. It also seeks a relationship that is established not only with the learner but also with the learner's environment (Goldring et al., 2009; Leithwood et al., 2010; Hallinger, 2011). Educational leadership is characterized by cooperation in the educational process, that is, when the educator and the learner pursue common educational goals and outcomes (Mulford & Silins, 2003; Murphy et al., 2007).

There is much research done internationally on coaching, instructional and educational leadership styles, which is why it is not a new phenomenon (Hajisoteriou, 2012; Hallinger, Piyaman et al., 2017).

Meanwhile, research on leadership, school leadership, its concept and types has been conducted in Lithuania by Talalienė and Šečkuvienė (2015), but their comparison is based on descriptive analysis. Nevertheless, separate research, both in Lithuania and internationally, on the differences and similarities between coaching, instructional and educational leadership styles is still lacking. In scientific research there is much general information, repetitive, but this is not structured according to parameters (criteria), which would reflect education and learning. The purpose of this research is to compare the particular leadership styles according to formulated original parameters (criteria). This scientific article is based on a comparative literature review.

1   Methodology

The sources of scientific literature were selected according to these significant concepts: leadership, leadership styles, leadership style, coaching leadership, educational leadership, instructional leadership, types of leadership styles, differences and similarities between coaching, instructional and educational leadership, the styles of coaching, instructional and educational leadership. Performing the research of scientific literature, 45 scientific sources were analyzed: out of these, 1 national and 44 international scientific literature sources were investigated.

To perform the research on the differences and similarities of coaching, instructional and educational leadership styles, the method of comparative theoretical analysis was chosen. According to Miethe and Drass (1999) comparative analysis is used in macro social research. Meanwhile, other scientists name this analysis macroscopic comparative analysis (Leech & Onwuegbuzie, 2008). Qualitative comparative analysis involves a systematic analysis of similarities and differences of particular concepts within the research problem (Miethe & Drass, 1999). The purpose of presented matrixes are to reveal comparisons based on criteria (Chen, 2016). Therefore, in this study, the parameters (criteria) of each leadership style were singled out, according to which the essential features of each style were described. In the table, the data were systematized until the information was repeated. Then comparative groups, in this case parameters (criteria), searching for commonalities, allowed to simplify, identify and remove unnecessary variables from the table (Miethe & Drass, 1999). Performing a theoretical comparative analysis, the following criteria were identified for differences in such leaderships styles as: goal, implementation of the educational process/teaching methodologies, leader's activity, educator's activity, learner's results, learning environment, relationships in leaderships, teamwork, educator's professional development and personal features, advantages and disadvantages. Identification of such similarities of leadership criteria as factors that determine success in the educational process, learning environment, learning process outcomes, feedback, and similar benefits of leadership then followed.

2   Results

2.1 Differences between coaching, instructional and educational leadership styles

Literature review of differences between coaching, instructional and educational leadership styles revealed that each of these styles has such parameters (criteria) as: goal, implementation of educational process/teaching methodologies, leader's activity, educator's activity, student's activity, student's results, learning environment, relationship in leadership, teamwork,

educator's professional development and personal features, advantages and disadvantages.

Table 1

Differences between coaching, instructional and educational leadership styles

Criterion	Coaching leadership/Authors	Instructional leadership/Authors	Educational leadership/Authors
Goal	- Help the educator to improve and achieve goals (Berg & Karlseno, 2007).	- Encourage the learner to understand and recognize effective learning, and the educator should be able to improve students' learning having a conversation (Hallinger, 2011).	- Create the conditions for distribution leadership in education (Male & Palaiologou, 2015).
Implementation of educational process	- Providing new tasks and maximizing them (Robertson, 2008). - Right time planning of the educational process (Bean et al., 2010). - Effective training (Eriksen et al., 2020).	- Emphasis on curriculum and teaching (Smith & Andrews, 1989). - Effective modeling of training (Southworth, 2009).	- Continuous accumulation of knowledge (Murphy et al., 2007). - Systematization of learning experiences (Hart, 1999).
Manager's activity	- Manage activities, human resources, behavior of relationship and systematize everything (Turnern, 2010). - Strengthen work, develop internal trust and communication (Pousa & Mathieu, 2015).	- Create training goals and programs, control training (Hallinger, 2011). - Observe and instruct teachers (Southworth, 2002).	-

Educator's activity	- Constant consistency and repetition of tasks (Milner & McCarthy 2020). - Focus on teaching goals that influence students' success (Crocker & Knight, 2005).	- Understanding of learning needs (Helen & Printy, 2003). - Leading of the educational process (Smith & Andrews, 1989). - Monitoring and improving students' progress (Southworth, 2009).	- Collaboration with parents and organizations (Hajisoteriou, 2012).
Learner's results	- Students' assessment results (Bean et al., 2010).	- Good results (Lee & Smith, 1996).	- Achievement of high results (Cotton, 2003).
Learning environment	-	- Organized, disciplined, safe and supportive educational environment (Goldring et al., 2009).	- Improvisational and supportive (Baporikar, 2018).
Relationship in leadership	- Equivalence, interconnection (Robertson, 2008).	- Relationship with students and the home environment (Smith & Andrews, 1989).	- Collaboration between teachers, students, and leaders (Mulford & Silins, 2003).
Teamwork	- Mutual process, when the leader influences the learner, seeks to advise, develop knowledge and skills (Hallinger, 2007).	- It aims to share a common vision in the educational process by encouraging students (Leithwood & Riehl, 2005).	-

Educator's professional development	- The improvement of professional activity (Haan et al., 2010).	- Professional knowledge and competence (Spillane et al., 2003). - The improvement of continuous knowledge (Hallinger et al., 2017).	- The improvement of knowledge (Hart, 1999).
Advantages	- Guide the student towards career success (Peng et al., 2019).	- Teaching is student-oriented, and professional communities of teachers are also formed (York-Barr & Duke, 2004).	- Opportunities are created to develop the student's artistic identity, while teachers become learners (Baporikar, 2018). - Share of interest (Harris, 2008).
Disadvantages	- Exceeding of the content and pedagogical knowledge (Knight, 2007).	-	- Reduction of knowledge progress (Murphy et al., 1983).

Goal: The aim of coaching leadership, according to Berg and Karlseno (2007) is directed to help. That means to help the learner improve through the use of an active leader's questionnaire. The active questionnaire helps the learner change learning habits in order to achieve very important educational goals. On the contrary to coaching leadership, the instructional leadership aim is directed to effective education. As reported by Southworth (2009) effective teaching aims to improve the teaching and learning of students. Also in this leadership it is sought to engage the learner in a dialogue which helps recognition of the learner's effective learning and outcomes. Effective training in instructional leadership is modelled, monitored, and advised by management. Meanwhile, the goal of educational leadership is to develop a variety of learner abilities, build learning communities, and pursue learning goals by creating the conditions for distributed leadership (Male & Palaiologou, 2015).

Educational process: Coaching leadership development is focused on the context of professional practice. That means when two people have a relationship in the process of education in order to achieve common goals. Such

education is the most effective when the educator uses a variety of actions: provides new tasks (Robertson, 2008), reviews works, discusses, pays attention to results (Bean et al., 2010) and also effectively maximizes tasks. Meanwhile, the process of instructional leadership development is focused on the emphasis on curriculum and teaching. In accordance with Smith & Andrews (1989) the curriculum also includes an organized environment and high academic employment, as well as frequent assessment of student progress. However, the process of developing educational leadership, in contrast to coaching and instructional, is characterized by constant attention and a structured learning experience. In order to accumulate knowledge and facilitate the learning process in education, the educator needs to pay attention and systematize the learning experience (Hallinger, 2011; Murphy et al., 2007). Also, in all leadership processes, effective learner training prevails in the educational process (Eriksen et al., 2020).

Manager activity: The leader in coaching leadership requires a systematic nature of ruling activity that is results oriented, with compatibility of human resources. According to Pousa & Mathieu (2015), dedication to work, building inner confidence, strengthening work, and instruction is very important. At the same time, the activities of the instructional leadership manager are characterized by curriculum management (coordinating the curriculum, monitoring student progress) and promoting a positive environment (protecting teaching time, promoting professional development, encouraging teachers, and promoting learning).

Educator activity: In coaching leadership, the educator's activities are focused on providing constant and consistent tasks to the students and giving attention to achieving the student's goals. Applying tasks and giving attention contribute to the learner's success (Crocker & Knight, 2005). But unlike coaching leadership, the instructional leadership educator's activity, according to Helen and Printy (2003), is aimed at understanding learning needs, coaching, creating a social and interactive environment, selecting learning knowledge and tasks, and applying methods that promote student motivation. Meanwhile, the activities of the educational leadership educator are focused on such activities as community mobilization, and cooperation with parents (Hajisoteriou, 2012). Also, the activities of this leadership educator are characterized by the ability to lead others, the desire to learn new things constantly and adapt to change.

Learner results: All leadership focuses on student outcomes, but all of them differ. In coaching leadership, the educator focuses on the results of the assessment (Bean et al., 2010). Meanwhile, in instructional leadership, according to Lee and Smith (1996) most attention is paid to good results for which the school community is responsible. Furthermore, educational leadership seeks high results. Cotton (2003) says, in order to achieve high results, parents and other members of community are involved.

Learning environment: Goldring et al. (2009), notice that in instructional leadership the learning environment is academic and accurate. Arrangement, discipline and security prevail: in contrast to instructional leadership in educational leadership, the learning environment is free. As Cotton (2003) admits, such an environment creates a supportive and improvisational culture of communication.

Relationship in leadership: In coaching leadership education takes place through partnership. Robertson (2008) explains that this means that both the educator and the teacher engage in the relationship as equals. And this requires daily experience to put the effectiveness of a warm relationship in practice. However, in instructional leadership, in contrast to coaching, relationships are maintained and developed not only with the learner but also with his/her home environment. (Smith & Andrews, 1989). Meanwhile, in educational leadership, as Mulford and Silins (2003) say, relationships prevail between teachers, students, and school leaders. Such relationships are based on a common feature that includes an atmosphere of trust and cooperation, a shared and controlled mission, and continuous professional development.

Teamwork: Mutual work is important in coaching leadership – both for the educator and the student. Hallinger (2007) claims that leadership must be understood as a process of mutual influence, not as a one-way process in which leaders influence others. In the meantime, in instructional leadership, according to Leithwood and Riehl (2005), teamwork aims to encourage students to pursue a shared vision of goals.

Learner professional development: In coaching leadership, it is important for the educator's professional development to change his/her behavior, but not his/her personal qualities. In this way professional activity and efficiency in organization are improved (Haan et al., 2010). Also, it is essential to improve skills and inner competencies. Meanwhile, both instructional and educational leaderships are characterized by professional development, where the professional knowledge, skills and competences of educators are enhanced (Hart, 1999).

Advantages: In coaching leadership, according to Peng et al. (2019), the student's career predominates. This happens because in this leadership, much attention is paid to the learner providing him/her any help in different situations. Meanwhile, the advantage of instructional leadership is that education is focused on a student's training and the formation of a professional community (York-Barr & Duke, 2004). However, unlike coaching and instructional leadership, educational leadership has the following benefits: the pursuit of common educational goals and the development of students' artistic identity. The concept of shared leadership prevails in such leadership (Harris, 2008).

Disadvantages: In coaching leadership, it is observed that applying such a leadership style in education, content and pedagogical boundaries are transcended (programs and attitudes) (Knight, 2007). On the other hand, in

educational leadership, as Murphy et al. (1983) claim that the lack of methodological tools does not lead to the acquisition of essential knowledge of progress.

2.2 Similarities between coaching, instructional, and educational leadership styles

Scientific analysis of the similarities between coaching, instructional, and educational leadership styles has revealed that each of these styles has criteria such as: factors that determine success in the learning process, learning environment, learning outcomes, feedback, and similar leadership benefits.

Table 2

Similarities between coaching, instructional, and educational leadership styles

Criterion	Coaching leadership/Authors	Instructional leadership/Authors	Educational leadership/Authors
Factors determining success in the educational process	- Growth and change (Clutterbuck & Megginson, 2005).	- Cooperation, professional development and promotion of learning (Urick, 2016).	- Clear and effective communication and relationship building skills, effective design of educational process and promotion of new perspectives (McLeod, 2007).
Learning environment	- Positive (Clutterbuck & Megginson, 2005).	- Supportive (Urick & Bowers, 2014).	- Trust and respect (McLeod, 2007).
Learning process outcomes	- Effective results (Cox, Bachkirova, & Cutterbuck, 2014).	- Fast outcomes (Shaked, 2019). - Good learning results (Spillane et al., 2003).	
Feedback	- Feedback and praise (Berg & Karlseno, 2007); - Repetition of feedback at a later time (Harrison, 2007).	- Opportunities of feedback (Blase & Blase, 1999).	- Providing feedback (McLeod, 2007).

Factors determining educational success: Similar factors prevail in all leadership styles, which determine the success of education, that is: improvement of education, assistance in the educational process, ability to motivate and promote understanding, career growth and change (McLeod, 2007; Urich, 2016).

Learning environment: The same learning environment predominates in coaching, instructional and educational leadership. According to Clutterbuck and Megginson (2005) these environments are characterized by trust, positivity, support and growth in an educational atmosphere. The authors claim that in such an environment, the learner feels good and thus achieves high learning outcomes.

Learning results: Coaching and instructional leadership have high results in the educational process. A strong school community is responsible for these results of leadership (Lee & Smith, 1996; Spillane et al., 2003). Shaked (2019) says that using coaching and instructional leadership it is possible to improve and achieve the same learning outcomes much faster.

Feedback: In the educational process, using coaching, instructional and educational leadership, feedback to the learner dominates. According to Berg and Karlsen (2007) through feedback, the student is given praise, remarks and improvements in education. As Harrison and Knight (2007) declare, in applying the types of leadership the student is observed in a certain activity and this results in providing comments about what is being done well and what needs to be improved.

Conclusion

Every type of leadership is specific and has its own particular features, distinguishing the differences and similarities that prevail in them. Coaching leadership is characterized by the help given by the educator to the learner, and understanding and warm relationships between them in the educational process, which determine further career success. Instructive leadership is based on the development of interrelations not only with the learner, but also with the learner's environment, the educator's guidance in the educational process, effective teaching and the pursuit of high results. Finally, educational leadership is distinguished by common work, the pursuit of common goals between the educator and the student, and the process of sharing education. Meanwhile, according to the similarity parameters (criteria), the analyzed leadership styles are characterized by good communication skills, development, motivation, positive learning environment, the pursuit of high results, and the provision of feedback. These similarities come out in the factors of educational process which determine success, learning environment, feedback, learning results and benefits.

References

Baporikar, N. (2018). Educational leadership for quality teacher education in the digital era. In *Handbook of Research on Educational Planning and Policy Analysis* (pp. 241-255). Port Harcourt: Pearl Publishers.

Blase, J., & Blase, J. (1999). Principals' instructional leadership and teacher development: Teachers' perspectives. *Educational Administration Quarterly*, *35*(3), 349-378. https://doi.org/10.1177/0013161X99353003

Bean, R. M., Draper, J. A., Hall, V., Vandermolen, J., & Zigmond, N. (2010). Coaches and coaching in reading first schools: a reality check. *The Elementary School Journal*, *111*(1), 87-114. Retrieved from https://www.jstor.org/stable/10.1086/653471

Berg, M. E., & Karlsen, J. T. (2007). Mental models in project management coaching. *Engineering Management Journal*, *19*(3), 31-41. https://doi.org/10.1080/10429247.2007.11431736

Bachkirova, T., Cox, E., & Cutterbuck, D. (2014). Introduction. In E. Cox, T. Bachkirova, & D. Cutterbuck (Eds.), *The Complete Handbook of Coaching* (pp. 1-18). London: Sage Publications.

Chen, T. T. (2016). An inclusion comparison approach for multiple criteria decision analysis based on interval-valued intuitionistic fuzzy sets. *Technological and Economic Development of Economy, 22*(3), 357-392. https://doi.org/10.3846/20294913.2014.989930

Clutterbuck, D., & Megginson, D. (2005). *Making Coaching Work, Creating a Coaching Culture.* London: Charted Institute of Personnel and Development.

Crocker, J., & Knight, K. M. (2005). Contingencies of self-worth. *Current Directions in Psychological Science*, *14*(4), 200-203. https://doi.org/10.1111/j.0963-7214.2005.00364.x

Cotton, K. (2003). *Principals and Student Achievement: What Research Says*. Alexandria, VA: Association for Supervision and Curriculum Development.

Eriksen, M., Collins, S., Finocchio, B., & Oakley, J. (2020). Developing students' coaching ability through peer coaching. *Journal of Management Education, 44*(1), 9-38. https://doi.org/10.1177/1052562919858645

Goldring, E., Porter, A., Murphy, J., Elliott, S. N., & Cravens, X. (2009). Assessing learning-centered leadership: connections to research, professional standards, and current practices. *Leadership and Policy in Schools*, *8*(1), 1-36. https://doi.org/10.1080/15700760802014951

Harris, A. (2005). Leading from the chalk-face: an overview of school leadership. *Leadership*, *1*(1), 73-87. https://doi.org/10.1177/1742715005049352

Hallinger, P. (2007). *Research on the practice of instructional and transformational leadership: Retrospect and prospect.* Paper presented at the ACER Research Conference, Australia. Retrieved from

https://research.acer.edu.au/cgi/viewcontent.cgi?article=1004&context=research_conference_2007

Haan, D. E., Bertie, C., Day, A., & Sills, C. (2010). Clients' critical moments of coaching: Toward a "client model" of executive coaching. *Journal of Academy of Management Learning & Education*, *9*(4), 607-621. https://doi.org/https://doi.org/10.5465/amle.9.4.zqr607

Helen, M. M., & Printy, S. M. (2003). Principal leadership and school performance: An integration of transformational and instructional leadership. *Educational Administration Quarterly, 39*(3), 370-397. https://doi.org/10.1177%2F0013161X03253412

Hallinger, P. (2011). Leadership for learning: lessons from 40 years of empirical research. *Journal of Educational Administration*, *49*(2), 125-142. https://doi.org/10.1108/09578231111116699

Hallinger, P., Liu, S., & Piyaman, P. (2017). Does principal leadership make a difference in teacher professional learning? A comparative study China and Thailand. *Compare: A Journal of Comparative and International Education*, *49*(3), 341-357. https://doi.org/10.1080/03057925.2017.1407237

Harris, A. (2008). Distributed leadership according to the evidence. *Journal of Educational Administration*, *46*(2), 172-188. https://doi.org/10.1108/09578230810863253

Hart, A. W. (1999). Educational leadership: a field of inquiry and practice. *Educational Management & Administration*, *27*(3), 323-334. https://doi.org/10.1177/0263211X990273008

York-Barr, J., & Duke, K. (2004). What do we know about teacher leadership? Findings from two decades of scholarship. *Review of Educational Research*, *74*(3), 255-316. https://doi.org/10.3102/00346543074003255

Knight, J. (2007). *Instructional Coaching: A Partnership Approach to Improving Instruction.* Thousand Oaks, CA: Corwin.

Leech, N. L., & Onwuegbuzie, A. J. (2008). Qualitative data analysis: A compendium of techniques and a framework for selection for school psychology research and beyond. *School Psychology Quarterly, 23*(4), 587-604. http://dx.doi.org/10.1037/1045-3830.23.4.587

Leithwood, K., & Riehl, C. (2005). What do we already know about educational leadership? In W. A. Firestone & C. Riehl (Eds.), *A New Agenda for Research in Educational Leadership* (pp. 12-27). New York, NY: Teachers College Press.

Louis, K. S., Leithwood, K., Wahlstrom, K., & Anderson, S. (2010). *Investigating the links to improved student learning: Final report of research findings.* St. Paul, MN: Center of Applied Research and Educational Improvement.

Lee, V. E., & Smith, J. B. (1996). Collective responsibility for learning and its effects on gains in achievement for early secondary school students.

American Journal of Education, *104*(2), 103-147. https://doi.org/ 10.1086/444122

Male, T., & Palaiologou, I. (2015). Pedagogical leadership in the 21st century: Evidence from the field. E*ducational Management, Administration & Leadership*, *43*(2), 214-231. https://doi.org/10.1177/1741143213494889

Marks, H. M., & Printy, S. M. (2003). Principal leadership and school performance: An integration of transformational and instructional leadership. *Educational Administration Quarterly*, *39*(3), 370-397. https://doi.org/10.1177/0013161X03253412

Miethe, T. D., & Drass, K. A. (1999). Exploring the social context of instrumental and expressive homicides: An application of qualitative comparative analysis. *Journal of Quantitative Criminology*, *15*(1), 1-21. http://dx.doi.org/10.1023/A:1007550704282

Milner, J., Trenton Milner, T., & McCarthy, G. (2020). A coaching culture definition: An industry-based perspective from managers as coaches. *The Journal of Applied Behavioral Science*, *56*(2), 237-254. https://doi.org/ 10.1177/0021886320905126

McLeod, A. (2007). *Self-Coaching Leadership: Simple Steps from Manager to Leader*. Chichester: John Wiley & Sons.

Mulford, B., & Silins, H. (2003). Leadership for organisational learning and improved student outcomes - What do we know? *Cambridge Journal of Education, 33*(2), 175-195. https://doi.org/10.1080/03057640302041

Murphy, J., Hallinger, P., & Mitman, A. (1983). Problems with research on educational leadership: Issues to be addressed. *Educational Evaluation and Policy Analysis,* *5*(3), 297-305. https://doi.org/10.3102/ 01623737005003297

Murphy, J., Vriesenga, M., & Storey, V. (2007). Educational administration quarterly 1979-2003: An analysis of types of work, methods of investigation, and influences. *Educational Administration Quarterly*, *43*(5), 612-628. https://doi.org/10.1177/0013161X07307796

Pousa, C., & Mathieu, A. (2015). Is managerial coaching a source of competitive advantage? Promoting employee self-regulation through coaching. *Coaching*: *An International Journal of Theory, Research and Practice, 8*(1), 20-35. https://doi.org/10.1080/17521882.2015.1009134

Peng, Z., Gao, B., & Zhao, H. (2019). Coaching leadership and subordinates' career success: The mediating role of leader–member exchange. *Social Behavior and Personality: An international journal*, *47*(11), e8406. https://doi.org/10.2224/sbp.8406

Robertson, J. (2008). *Coaching Educational Leadership. Building Leadership Capacity Through Partnership.* Los Angeles: Sage.

Southworth, G. (2002). Instructional leadership in schools: Reflections and empirical evidence. *School Leadership & Management*, *22*(1), 73-91. https://doi.org/10.1080/13632430220143042

Smith, W., & Andrews, R. (1989). *Instructional Leadership: How Principals Make a Difference*. Alexandria, VA: Association for Supervision and Curriculum Development.

Southworth, G. (2009). Learning-centered leadership. In B. Davies (Ed.), *The Essentials of School Leadership* (pp. 91-111). London: SAGE.

Spillane, J. P., Diamond, J. B., & Jita, L. (2003). Leading instruction: The distribution of leadership for instruction. *Journal of Curriculum Studies*, *35*(5), 533-543. https://doi.org/10.1080/0022027021000041972

Shaked, H. (2019). *Social Justice Leadership, Instructional Leadership, and The Goals of Schooling*. Netivot, Israel: Hemdat Hadarom College of Education. Retrieved from https://haimshaked.com/wp-content/uploads/2019/08/pdf-1.pdf

Talalienė, Ž., & Šečkuvienė, H. (2015). Muzikos mokytojo lyderystės gebėjimų raiška. *Pedagogika*, *119*(3), 134-146.

Turner, P. S. (2010). *Aligning Organisational Coaching with Leadership Behaviour* (Doctoral thesis). Birmingham City University. Retrieved from http://www.open-access.bcu.ac.uk/4908/1/2010_Turner_533142.pdf

Urick, A. (2016). Examining US principal perception of multiple leadership styles used to practice shared instructional leadership. *Journal of Educational Administration*, *54*(2), 152-172. https://doi.org/10.1108/JEA-07-2014-0088

Urick, A., & Bowers, A. J. (2014). What are the different types of principals across the United States? A latent class analysis of principal perception of leadership. *Educational Administration Quarterly, 50*(1), 96-134. https://doi.org/10.1177/0013161X13489019

Identification of Key Management Graduate Profile in the Context of Industry 4.0

Gabriela Rozvadský Gugová - Silvia Barnová*

Abstract:

Introduction: From the aspect of the success of an organization and its competitiveness in the market, human capital has a crucial role to play. Therefore, universities should offer their students study programs corresponding with the needs of the labour market and to adjust their graduate profiles to the current requirements.

Purpose: The authors of the paper present a project carried out by DTI University in Dubnica nad Váhom, Slovakia. The aim of the project is to design a functioning model which could help update the management graduate profile in the context of Industry 4.0. The focus is on the theoretical background of the project and the research tools applied especially at its first stage.

Methods: At the first stage of the project, a research on the key factors will be carried out. At the second stage, based on the obtained results, key aspects of the management graduate profile will be formulated and subsequently, a model having the potential to synchronize expectations, opportunities and finances will be designed and verified.

Conclusion: Based on the results, changes in the management study programme with the ambition to be implemented in the marketing strategies of both private and public universities will be suggested.

Key words: Industry 4.0, graduate profile, management, competencies, motivation, creativity, behavioural economics, study programmes.

Introduction

Universities should offer their students study programs corresponding with the needs of the labour market and to adjust their graduate profiles to the current requirements (Bilčík, 2016). One of the primary goals of Europe 2030 Agenda is to reform selected aspects of university education. Human capital is a key strategic tool especially in the case of business entities. It is expected that the

---

* Gabriela Rozvadský Gugová, DTI University, Department of School Pedagogy and Psychology, Dubnica nad Váhom, Slovakia; gugova@dti.sk
  Silvia Barnová, DTI University, Department of School Pedagogy and Psychology, Dubnica nad Váhom, Slovakia; barnova@dti.sk

increasing robotization of production processes will lead to changes in the qualification requirements placed on personnel in organizations. At DTI University, Dubnica nad Váhom, Slovakia, a research on the identification of the key factors is going to be carried out, including a comparison of selected behavioural economics models. Based on the gathered data, our intention is to design a functional model, the application of which will help update the management graduate profile in the context of Industry 4.0.

1   Goals of the project

The main goal of the project is to identify and update the key management graduate profile in the context of Industry 4.0. In the first year of its realization, knowledge in the field of the requirements of the market will be updated and the obtained data will be compared with models of behavioural economics. Based on the gathered data, the investigators will design a functional model, the application of which will help to update the key management graduate profile in the context of Industry 4.0.

Partial goals of the project are as follows:

a) to collect data using:
  - a questionnaire focused on robotization in production,
  - tests on students' motivational tendencies - Schmalt's Multi-Motive Grid, performance prediction using GMA - Evaluation of Managerial Prerequisites, Personality Factors Inventory, NEO-Five-Factor Inventory - NEO-FFI (Ruisel & Halama, 2007), Coping Inventory based on Krohne's coping modes (Psychodiagnostika, a.s., 2020) – will be administered and evaluated using STATISTICA and Weka softwares;

b) to work out interpretational schemes and statistically verify the hypothesis about the impact of mutual relationships between the observed phenomena; to compare the market's expectations with data gathered from students, with selected models of behavioural economics and cognitive psychology. At this stage, the project teams' work will be focused on the following phenomena: decision making under uncertainty; the prospect theory; sources of intuitive judgement and choice; the role of emotions; and affective heuristics. The research is inspired by Kahnemans' and Thaler's theories. According to Kahneman (2011), our brain has two separate operating systems: the automatic System I (expert, heuristic, intuitive thinking, perception, memory) and the intentional System II (rules of rationality, statistical thinking, deviation from rationality, system errors in the mechanism of cognition, overestimation and underestimation). Also Thaler's (2017) model of unpredictable behaviour is interesting in the discussed context. It is based on the following premises:
  1. Emotionality has a significant impact on rationality.
  2. Human behaviour is strongly influenced by societal preferences.

3. A lack of self-control (self-regulation) leads to the inability to synchronize short-term and long-term goals.

c) to identify and specify the key aspects of the management student profile in the context of Industry 4.0;

d) to design and experimentally verify a model which will have the potential to synchronize expectations, opportunities and finances;

e) to work out and publish the suggested strategies for the development and the direction of the realization of education, as well as the designed study plans, the characteristics of profile subjects, etc.

2   Description of the project

When creating the project, the project team used the current knowledge from the fields of cognitive and social psychology. We were inspired by the requirements of the Europe 2030 Agenda focusing on reforming selected aspects of university education and preparation for the labour market. The aim of the project is derived from the needs of Industry 4.0. Not only technological solutions, but also the process of digitalization brings new aspects to leadership. The need for new skills in managing people and the continual necessity to update the technical skills of personnel in the production process and in engineering professions represent new challenges for managers in organizations which are the pioneers in introducing Industry 4.0. Creativity, team work and the personnel's emotional intelligence are more and more emphasized.

3   Theoretical background

The project is based on the work of the authors of behavioural economics Kahneman (2011), Thaler (2017, 1985, 1980), and Sternberg (2002). We were inspired by Kahneman (2011) and his theory of two systems. The second source of inspiration was the author's (Kahneman, 2011, 2012) updated theory of heuristics in processing and problem solving through the model of the "experiencing self" and "remembering self." Kahneman, Taversky and Simon (1979, 1982, 1983), already in the last century, worked on theories of processing information and models of precise intuition and decision making under uncertainty. Simon (1992, 2020) as the founder of the decision-making theory, considered decision making an important part of management, he saw situations in the context of hints and saw intuition as recognition of something. In several publications, he claims that objective, rational decision-making is impossible as it places exaggerated requirements on the decision maker's cognitive abilities. Decision making is determined by the subject's prerequisites for it - ability, knowledge, personal aspirations, interests, momentary state of mind, mood, and objective conditions of material and immaterial character (Simon, 1992). In agreement with him, Kahneman (2011) brings the concept of two systems enriched by the emotional dimension in models of "experiencing self" and

"remembering self" - being a valuable resource on which the presented research is based. The presence of emotionality, the impact of anxiety and taking action in intuitive decision making under uncertainty was discussed in the early studies by Kunreuther (Kunreuther, Pauly et al., 2013), but also in the studies by other authors, such as Slovic, Fischhoff, and Lichtenstein (1982), in which the participants indicated the possible causes of death, illnesses, lightning, etc. It was Slovic who created the concept of affective heuristics, where, in the process of judgment and decision making, individuals consult their own emotions: Do I like it? Do I hate it? How strong are my feelings towards it? According to several authors (Kahneman, 2012; Slovic, 2016; Damasio, 1994, 1996), affective heuristics is an example of substitution where the answer to a simple question (How do I feel about it?) serves as an alternative answer to a more complicated question (What do I think about it?). Damasio found out that individuals who do not show their emotions prior to making a decision, have a decreased ability to make good decisions. An inability to be healthily worried belongs to the known destructive distortions in decision making. Damasio (1996) noticed that in currently generally accepted studies, emotional appraisal of results, physical condition and approaching or avoiding tendencies related to them play an important role in decision making. These ideas are reflected in Kahneman's (2011) model of experiencing and remembering self. Similarly, Thaler (2017) believes in the impact of emotionality and claims that the economic theory in practice assumes that problems with self-regulation do not exist. The key feature of Smith's (1981) understanding of emotions is that they are myopic, i.e. short-sighted. "The pleasure, which we should enjoy in ten years from now, if compared to that which we can enjoy today, is not interesting to us." Thaler (2017) comments on the current theories of economists as ignoring the impact of emotionality. According to him, the problems are caused by the model applied by economists. In contrast to the rational world of economists, people often act unpredictably, which leads to situations when economic models bring a number of misconceptions. His thesis is: conditioned optimization + equilibrium = economics (Thaler, 2017). "The cost of a missed opportunity", represents what you give up if you perform a certain activity. Realizing that the cost of a missed opportunity equals to paying the expenses from own resources causes problems to economists as well. To let an opportunity go is not as painful as to withdraw money from your wallet to pay for something. In comparison with paying real money, the cost of a missed opportunity is vague and uncertain. Thaler (2017) describes the "acquisitive effect" as a phenomenon, in which paying extra costs means expenditure covered from own resources, while not getting a discount is only the cost of a missed opportunity. The same phenomenon is described by Kahneman and Tversky as "the phenomenon of framing." (Thaler, 2017) Above, there are only several examples of the ideas of Nobel Prize winners for economics, so, we included emotionality among the important factors from the aspect of the identification of the key profile of management graduates.

4   Research tools

When working with the model of System I and System II (Kahneman, 2012), it is necessary to identify the sources of intuitive judgement, abilities and the applied types of heuristics for the selected samples of individuals. The key factors are: motivation, abilities, selected personality traits and emotionality, resp. affective heuristics. In the process of optimizing the human motivational potential, it is a necessity to study their motives, incentives playing an important role in potential situations. It is important in the field of work, especially in selecting people for particular job positions or finding appropriate jobs for particular persons. Such an opportunity is offered by Schmalt's, Sokolowski's, and Langens's "Multi-Motive Grid" (adapted by Koubek) (Psychodiagnostika, a.s., 2020). In both fields, the efficiency of the selected methods was proved. It proved to be similarly efficient in its clinical application, e.g. by analysing therapeutic motivation or the field of patients' anxiety. The scale satisfies all psychometric criteria, i.e. construction, validity and reliability.

An individual's abilities can be researched on by means of GMA - Evaluation of Managerial Prerequisites, which enables investigation into the structure of abilities closely related to successful work at high job positions in the field of industry, business and services. It contains three types of tests: numeric, verbal, and abstract. Each of them has two forms - "A" and "B." The verbal test is a means for diagnosing verbal comprehension skills and critical thinking, which are important at managerial job positions. It can well differentiate persons who are able to connect their abilities with practical judgement. The numeric test serves for finding out about the level of numeric judgement (it is not an arithmetic test) and provides data on the level of orientation in such numeric skills, which are becoming more and more required from a modern manager. The abstract test focuses on the abilities, which are - in psychological literature - called fluid intelligence, divergent thinking, inductive insight, and flexibility. It accentuates the level of cognition based on understanding the essence of the solution. The results are graphically displayed in tables of all measured values and the table of reactions on individual tasks including data on correct or wrong solutions, or whether a task has or has not been solved at all.

The potentials for affective heuristics, the presence and degree of emotional instability, are investigated into by NEO-FFI (NEO Five Factor Inventory by Costa and McCrae) adapted by Ruisel and Halama (2007). The questionnaire can be used for diagnosing the basic personality factors in adolescents aged 15 years and older and adults. It can be applied in counselling, clinical psychology, diagnostics in the personal sphere, as well as personality research. The inventory satisfies all psychometric criteria: construction, validity, and reliability.

Another option is Krohne' and Egloff's ABI Coping Inventory adapted by Vander. The Inventory is based on Krohne's (1989, 1993) model of coping and diagnoses individual differences in coping with anxiety, resp. stress in two major dimensions: vigilance and cognitive avoidance. It consists of two subtests: E -

captures coping with anxiety by individuals in situations, which are important for self-evaluation (e.g. exams, interviews, public speeches, sports matches, etc.); and P - measures coping with anxiety in physically risky situations (e.g. visits to a doctor or a dentist, before a surgery, etc.). Each subtest creates scales for measuring vigilance and cognitive avoidance. Alongside with that, the overall test - T - can be applied. The aim is to identify individuals, which have not developed appropriate strategies for coping with adversity, as well as leading these individuals towards a process of change. This inventory can be applied in the process of placing new employees. It satisfies all psychometric criteria, i.e. construction, validity and reliability.

5 System I and System II in the context of the new management graduate profile

For the purposes of the identification of key management graduate profile in the context of Industry 4.0 we used Kahneman's (2012) dual system.

Characteristics of System I (Kahneman, 2011):
- a fast system;
- generates impressions, feeling, inclinations, which can change to opinions, attitudes and intentions after being approved by System II;
- automatic, fast, and effortless functioning without intentional control;
- can be programmed by System II in order to attract attention when a model or a formula is detected;
- with sufficient training, it is capable of qualified reactions and generates qualified intuition;
- creates a coherent model of activated thoughts in the associative memory;
- phenomena of priming take place instead of a conscious approach (cognitive process, in which a stimulus from the past influences the future);
- creates a link between the feeling of cognitive simplicity and the illusion of truth with pleasant feelings alongside with decreased vigilance;
- distinguishes between surprising and normal;
- derives and invents causes and intentions;
- forgets about ambiguity and suppresses doubts;
- prone to trust and confirmation;
- overestimates emotional consistency (attachment);
- focuses on existing evidence and ignores missing evidence;
- generates a limited set of basic evaluation;
- represents sets according to norms and prototypes, it does not integrate;
- it compares intensity on various scales (size according to volume);
- carries out more calculations than necessary (mental shotgun);
- sometimes substitutes a complex question by a simpler one (heuristics);
- more sensitive to changes than to the status quo (prospect theory);

- overestimates low probabilities;
- shows a decreasing sensitivity to quantity (psychophysics);
- stronger reactions to losses than gains (aversion to losses);
- organizes decision making problems into frames in order to isolate them (framing);
- impressions of causality, tends to believe, the origins of religion embedded into the structures of System I (Bloom, 2020).

Characteristics of System II (Kahneman, 2011):
- a slow system;
- unwilling to invest more effort than required;
- in charge of doubting and not believing;
- conscious operations, intentional functioning requiring effort;
- engaged, analytical mode;
- estimates and calculates rates;
- makes decisions, manages System I;
- intentionally implements heuristics as strategic processes;
- approves of refuses heuristic responses;
- the slow System II often opts for the path of least resistance;
- capable of systematic and more caring approach to information;
- sorts and controls pieces of information;
- questions and tests hypotheses;
- unlike System I, it is capable of statistical reasoning;
- casual interpretation and acceptance;
- cognitive strain has a mobilizing effect on it;
- performs acts of self-control when it is necessary to overcome the need for intuition and the stimuli from System I;
- when the organism is overloaded, it is able to protect the most important activity and pay all the attention to it;
- makes mental effort at various pace: slow, running, sprinting...

Kahneman's (2012) dual system (System I and System II) served us as a source of inspiration for creating the below working characteristics:

Table 1

Working charakteristics

Undesired characteristics:	*Desirable characteristics:*
- high optimism + endurance	- optimism
- cognitive distortions – System I "What you see is all there is." (Kahneman, 2011)	- correction of cognitive distortions, Klein's concept of Premortem Analysis (Klein, 2008)

-	reluctance to change	-	seeking challenges
-	melancholic state of mind (a higher degree of uncertainty in decision making)	-	sanguine state of mind (entrepreneurs)
-	phlegmatic state of mind (a lack of energy in decision making)	-	choleric state of mind (corporate managers)
-	illusion of control	-	risk taking
-	the hypothesis of arrogance	-	talents for something
-	illusion of planning	-	belief in good judgement
-	ignoring competition	-	ability to control
-	ignoring the role of good luck	-	admitting the importance of timing the moment and the role of good luck
-	effect of superiority	-	willingness to undergo questioning, insisting on statistical reasoning
-	exclusive application of System I	-	application of the slow System II
-	excessive self-confidence	-	high self-confidence compared to the norm
-	inability to work with own mental contents	-	control over own mental contents
-	negative experiences	-	experiencing success, abilities leading to success
-	traumatic experiencing	-	experiencing security
-	over-engagement	-	dual attention here and now vs. there and then
-	inability to retreat	-	good observer

6   Research experiment

The newly designed theoretical model of education will be applied at DTI University for three semesters in the second year of the bachelor's programme (winter and summer semesters) and in the winter semester of the third year of the programme both in the control group and in the experimental group. Prior to the realization of the experiment, both groups will complete entrance tests focused on the observed indicators. Concurrently, students' performance will be observed in the process of solving tasks throughout all three semesters together with their grades from the courses they will take. The basic principle is that the same teachers must work with both groups. In the control and experimental groups of students, such variables as critical thinking, level of numerical judgement, divergent thinking, inductive insight and flexibility, heuristics, intuitive thinking, heuristics of processing and solving problems through the experiencing self and remembering self (Kahneman, 2011) will be observed. The experimental verification will be carried restricted in time. As for the

outputs, motivation and performance in decision making under uncertainty will be the observed variables.

7 Benefits of the project

We see the benefits of the project in designing a new model applicable in preparing management students for the needs of Industry 4.0 in the fields of a managers' personality, i.e. managerial prerequisites, and in motivating management students. The model of key management graduate profile will be based on Kahneman's model of two systems and the model of experiencing and remembering self. As for the current curriculum, it will be analysed and the differences between the offered courses in management study programmes and selected theories of behavioural economics will be identified. Also a complex material, which can be used as a basic source of information for universities in recruiting students in accordance with Europe 2030 Agenda will be prepared.

Conclusion

The issues of Industry 4.0 in the context of management have not been systematically dealt with; there is a lack of publications on the key changes in profiling management as well as pre-gradual management study programmes with regards to the requirements of Industry 4.0. We believe that the model suggested by us will represent a contribution to the field of management and will not only bring the knowledge of the profile but it, based on the gathered data and in accordance with behavioural economics, has the ambition to suggest changes in management and in lifelong learning programmes and, in such a way, fill in a blank space in university pedagogy.

References

Bilčík, A. (2016). Východiská vplývajúce na dosahovanú kvalitu vzdelávania. In *Schola nova, quo vadis? Sborník recenzovaných příspěvků mezinárodní vědecké konference* (pp. 29-32). Praha: Extrasystem.

Bloom, P. (n.d). Is God an Accident? *The Atlantic.* Retrieved from https://www.theatlantic.com/magazine/archive/2005/12/is-god-an-accident/ 304425/

Damasio, A. (1994). *Descartes Error: Emotion, Reason, and the Human Brain.* New York: Putnam.

Damasio, A. (1996). The Somatic Marker Hypothesis and the Possible Functions ofthe Prefrontal Cortex. *Philosophical Transactions: Biological Siences, 351,* 1413-1420. Retrieved from https://sk.wikipedia.org/wiki/Herbert_ Simon

Kahneman, D. (2011). *Thinking, Fast and Slow.* Farrar, Straus and Giroux.

Kahneman, D. (2012). *Myšlení rychlé a pomalé.* Brno: Jan Melvil Publising.

Klein, G. (2008). Performing a Project Premortem. *Engineering Management Review, IEEE, 36.*, 103-104. https://doi.org/10.1109/EMR.2008.4534313.

Kunreuther, H. C., Pauly, M. V. et al. (2013). *Insurance and Behavioral Economics: Improving Decisions in the Most Misunderstood Industry.* Cambridge: Cambridge University Press.

Psychodiagnostika, a.s. Retrieved from http://www.psychodiagnostika-as.sk/Katalog_popis.asp?kod=591&ZozArg=1&Kateg=2

Ruisel, I., & Halama, P. (2007). *NEO päťfaktorový osobnostný inventár (podľa NEO Five Factor Inventory P. T. Costu a R. R. McCraeho).* Praha: Testcentrum-Hogrefe.

Simon, H. A. (1992). What is an explanation of behavior? *Psychological Sience 3*, 150-161.

Slovic P. B., Fischhoff, B., & Lichtenstein, S. (1982). The perception of risk. In P. Slovic, *Response Mode, Framing, and Information-Processing Effects in Risk Assessment. New Directions for Methodology of Social and Behavioral Sience: Question Framing and Response Consistency* (pp. 21-36). San Francisco: Jossey-Bass.

Slovic, P. (2016). *The Perception of Risk.* London. https://doi.org/10.4324/9781315661773

Smith, A. (1981). *Teória mravných citov.* Praha: Liberální institut.

Sternberg, R. (2002). *Kognitívní psychologie.* Praha: Portál.

Thaler, R. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior and Organization, 1*, 39-60.

Thaler, R. (2017). *Neočekávané chování. Příběh behaviorální ekonomie.* Praha: Argo/Dokořán.

Thaler, R. H. (1985). Using mental accounting in a theory of consumer behavior. *Marketing Science, 4*, 199-214.

Thaler, R. H. (2017). *Neočekávané chování. Příběh behaviorální ekonomie.* Praha: Argo.

Structured, Analytical and Critical Thinking in the Educational Process of Future Teachers

Pavel Beňo - Patrik Havan - Sandra Šprinková[∗]

Abstract:

Introduction: In this article, we want to point out what kind of pedagogical and didactic change is being recorded in Slovakia's education system and we will point out where it could go and develop to achieve positive results. This article is one of the upcoming outputs in the form of paper and study on the provision of structured, analytical and critical thinking (SAC). In the article, it is shown how the situation has changed and how we perceive the attitude of students during the educational process. Next, it is described current problems and inadequacies in the educational process and define how to use a change of thinking to increase motivation and improve access to knowledge.

Purpose: In general, there is a consensus that it is important for teachers to be able to guide their students to problem-solving skills (Aktaş & Ünlü, 2013). It is pointed out that, with the right educational tools, such skills can be stimulated, developed and improved (Jordaan & Jordaan, 2005). This article is designed for all levels of education, but we are mostly concerned with educating future educators.

Methods: In this paper, there are described methods that can help to improve the quality of thinking of students and thus increase the level of thinking of the whole society. This article take inspiration from important historical personalities as well as relevant current personalities in their professions. Critical, analytical and creative thinking, also based on logical and structured thinking, is our main method of our educational process.

Conclusion: In conclusion, it is pointed out the need to develop SAC as a whole. It is important for the general publica to have better skills in SAC, for example, from the point of view of cognitive mistakes in experts, in the field of political literacy, recognition of misinformation and a better general awareness of rational thinking. As can be seen, SAC is not only about education, but it also closely affects society as a whole. It can thus

---

[∗] Pavel Beňo, Trnava University in Trnava, Trnava, Slovakia; pavel.beno@truni.sk;
  Patrik Havan, Trnava University in Trnava, Faculty of Philosophy, Trnava, Slovakia; patrik.havan@tvu.sk
  Sandra Šprinková, Trnava University in Trnava, Faculty of Education, Trnava, Slovakia; sandra.sprinkova@tvu.sk

influence the operation of the company, prevent the development of the first-class solutions offered and raise the whole company to a higher level.

Key words: structural, analytic and critical thinking, education, pedagogy.

Introduction

It is perceived that once, when a person encountered an engineer or a generally university-educated person, he was more likely to find a suitable topic with him. Most people with university education had an overview of what was happening in society and were able to evaluate it constructively. Today, however, it is perceived the situation differently. There is an incredible number of university-educated people, but from our personal experience, often (honouring exceptions), it is difficult to find common language, discussion, argument and solutions. Why is this so? This article tries to find the answer, where is considered the way that teaching thinking can be beneficial for the general perception of young people as well as to increase their interest in public affairs.

As participants in the educational process often find that students are described as uneducated, slack and especially irrational even in the circles of educators. It can be perceived that students often lack the motivation to learn. The society can ask whether educators should provide motivation for education alone, or it is a more complex problem reflecting their previous life experience with education. Also, our knowledge come from personal experience that students spent days and nights in labs and study rooms but nowadays these premises are empty. Where did the enthusiasm for education and achievement disappear? Perhaps the society have stopped teaching children and young people in a way that make them to think. Current generations discover information on the Internet and do not even think about whether the information is relevant or not (Šnídl, 2017). Even a lay society perceives the consequences of a wealth of information that overwhelms people and specifically the young. One of the consequences of the previous mentioned matter may also be a decrease in logical thinking. Logical thinking in this context can be defined as developed thinking such as analytical, structured and critical thinking (SAC). That is why it is important that the central issue of teaching future teachers is to support the development of thinking. Improvement of thinking could be caused also by using a multimedia educational materials and technologies (Hrmo, Miština, & Krištofiaková, 2016). Nowadays, we unfortunately see that the PASCAL programming language is still being taught in schools, which is mistakenly described as the bearer of the idea of teaching students to think in a structured way. This could be done if we disregard more factors. Since there is no research in this area yet, we infer at least from our experience and student feedback. Firstly, students consider PASCAL to be unnecessary and do not intend to pursue it because they do not see its applicability in their further practice. Secondly, they do not intend to learn

a programming language just to learn algorithmization, and thirdly, most strikingly, students are trying to pursue such a subject rather than focus on it. This causes them to twist two semesters somehow, and thus the whole development of thinking is equipped. According to us, it would be appropriate to find ways to change this situation. It is not only two semesters at university, but the whole society need a change. Indeed, such future educators who only completed this whole learning how to teach process will teach the new generation. Let's ask a question. How will they educate students? (Ballová Mikušová, 2019).

1 Purpose

In general, it is important that teachers have problem-solving skills and that they also lead their students to such skills (Aktaş & Ünlü, 2013). Jordaan and Jordaan (2005) argue that, with the right educational tools, such skills can be stimulated, developed and improved. It can be seen that the development of such skills is a challenge for the whole society, but especially for experts in relevant fields to find such educational tools and for them to be further applied in education.

It is necessary to lead students; to follow and consciously guide their thinking (we use the same procedures for example in teaching wushu, a Chinese martial art - author's comment). As students become aware of the ways they used to think, they become more autonomous in their own learning process. Zero Project at Harvard University (Ritchhart & Perkins, 2020) suggests that when students learn practices to develop thinking, it deepens. Ritchhart and Perkins (2020) utilize thought processes that are routinely reused (Kahneman, 2011; Tay, Ryan, & Ryan, 2016), a little like the Confucian Teaching Method (Tan, 2017).

We consider to be important to capture the development of thinking already in secondary and elementary schools and also to create the foundations of thinking in pre-elementary preparation of children in order to establish the habit of thinking more analytically and making decisions.

2 Methods

The aforementioned methods aimed at a group of students can also be important for the emergence of creative thinking. Creative thinking is a cognitive process; respectively, the creation of ideas that are often not as new as people might think, but most of all it is about realizing new connections between existing concepts. In this way, we or our students do not have to come up with a ground-breaking invention, but we can, on an elementary level, follow daily tasks and think about how to do them better. The authors encourage the creation of processes that allow and reward spontaneity and improvisation, thus promoting systemic change in thinking and, therefore, more effective student access to the learning process. We also consider it necessary to create a common vision for students, thus keeping the teaching process in a systematic and chosen structure

and avoiding the chaos that could occur immediately, if we do not do the needed arrangements. We also encourage the implementation of team tasks in the educational process. Let's give teamwork tasks, even though we do not want to get rid of things like learning with PASCAL. Let's change the tasks so that students are made to work together so that all the work on the project is not left to just one team.

Analytical thinking is one form of logical thinking and reasoning. It begins to manifest already in childhood and therefore it is well developed from an early age. However, analytical thinking is not only about mathematics, as is the frequent connotation of the term in the general population but is a process where one thing follows the other. As the name says, analytical thinking involves analysis. The analysis is an analysis of the whole problem, an examination of the individual aspects, and a selection of important information so that the smaller parts are eventually combined into larger ones and then to the resulting solution. It is therefore important to require analytical thinking from students to be able to quickly process a lot of changing information.

Critical thinking is an interdisciplinary issue. It is an area of scientific interest for a number of disciplines, for example in psychology, economics and also pedagogy (Frederick, 2005; Kahneman, 2011; Fahim & Eslamdoost, 2014; Toplak, West, & Stanovich, 2014; Čavojová, 2016; Tay, Ryan, & Ryan, 2016; Čavojová & Jurkovič, 2017). Fahim and Eslamdoost (2014) define critical thinking as a justification; a scientific and analytical method of problem solving, gaining evidence, arguments and knowledge. Today, rapid reactions and responses are often required, but often lead to erroneous decisions. The second way of thinking and making decisions - critical thinking - is slower but can lead to better results. In this way, the academic community in research often nowadays operates in thought - to think fast and slow (critical), or to system 1 and system 2 (Frederick, 2005; Kahneman, 2011; Čavojová, 2016). In research, the Frederick (2005) method is usually used to measure the level of critical thinking, which includes items that are automatically attacked by an inaccurate, intuitive answer (system 1/thinking fast), but when the student knows the correct answer, he perceives it as easy and logical. The basis is that the respondent must not be influenced by system 1, must not automatically respond, but instead use critical thinking (system 2/slow thinking). As an example, the question is: "If 5 machines take 5 minutes to produce 5 devices, how long will 100 machines take 100 devices?" The answer that, according to theory, system 1 is 100 minutes, system 2, or critical thinking this catcher will reveal. The correct answer is of course 5 minutes (Frederick, 2005).

In this case, system 1 plays the role of cognitive impulsivity and laziness which is the result of automatic thinking. System 1 is reflective, experiential, intuitive and automatic and accompanied by the absence of a sense of deliberate control. It is usually active when problems and tasks are routine and not surprising. As an example, Frederick (2005) used to recognize the face of a well-known person

who entered the room when we expect it. System 2 plays the role of critical thinking - judgment and cognitive processing capabilities and is more complex and rational. However, System 2 is slower and requires more cognitive effort, but in more complex situations it is likely to lead to better decisions (Frederick, 2005; Kahneman, 2011; Toplak, West, & Stanovich, 2014; Čavojová, 2016; Stoker, Hay, & Barr, 2016; Tay, Ryan, & Ryan, 2016; Ballová Mikušová, 2019). As an example of a situation where system 2 is involved, Frederick (2005) used a more complicated mathematical example (e.g. 53). To distinguish how system 1 and system 2 work, we can give another example. For example, if a politician today talks about complex, economic solutions that the voter simply cannot understand, instead of asking basic, relevant questions such as: "Is he telling the truth? "; "Does he provide solutions or just scream buzz words?", which System 2 would ask, System 1 employs a simpler approach: "Do I find the politician sympathetic?"; "Do his words fit with my beliefs?" (Kahneman, 2011). However, although System 1 may sound negative and harmful from these sources, this is not entirely true. Both systems have their place in human life, depending on situations and circumstances (Kahneman, 2011; Tay, Ryan, & Ryan, 2016).

Although critical thinking is often discussed today, it is not new. After all, Socrates introduced the so-called Socratic interview (Krošlák, 2012) where he examined assumptions and sought evidence, analysed the statements and uncovered contradictions. It is not surprising that critical thinking, although they did not call their studies so directly, was also employed by such personalities as Darwin (Darwin, 1887), Machiavelli (Harrison, 2009), Leonardo da Vinci (Armentano & Kun, 2019), and Thomas Aquinas (Dancák, 2016). In general, critical thinking can be defined as the ability to create one's own opinion based on the experience and knowledge gained. We will discuss this further in upcoming study and explain why not to deal with only one categorized way of thinking. Both methods of thinking begin with raising questions about the problem.

Conclusion

Critical thinking is particularly important in making good decisions in more challenging situations, including experts in their field (Frederick, 2005; Kahneman, 2011; Tay, Ryan & Ryan, 2016). They can automate the operations over time, making their work more efficient over time, but this can also result in various cognitive and inferior errors. Kahneman (2011) cites as a real example judges who decided on punishments differently based on whether they were hungry (it was the time just before lunch) or not. Critical thinking also has an impact on the perception of social and political issues (Stoker, Hay & Barr, 2016). Critical thinking, along with analytical thinking, can also serve as a defence against the unsubstantiated beliefs, myths and fake news to which we are now frequently exposed (Šnídl, 2017; Ballová Mikušová, 2019; Jurkovič,

2019; Šrol, 2019) and to which we are likely to be ever more frequently exposed in the future. Critical and creative thinking are also important abilities for finding place in labour market (Bajtoš, Lajčin, & Gabrhelová, 2020).

The main difference between critical and uncritical thinking is that uncritical, non-analytical and unstructured thought is not evaluated, estimated and carefully assumed, but is purely irrational and accompanied by a passive assumption (Kahneman, 2011). Building better thinking is a long-term process and leads to sufficient reflection and self-reflection (Bašnáková, 2019). With a greater degree of such thinking, one can better form one's own opinion, understand historical contexts, evaluate art and literature, link economic and political contexts, and, most importantly, work in a team and be flexible in times of rapid change.

Firstly, we wanted to point out in this article the need for a change in the teaching process. There is a specification that it should be mainly universities where future educators are educated, but such a specification would be short-sighted. The truth is that thought must be given a lot of attention, not only in education, whether high, secondary or elementary, but it must be dealt with in a flatrate way so that the nation is not subjected to the misinformation and illusions presented to them.

Of course, we do not consider this paper to be the result of our efforts. We will also try to create a study in which we will show how the education process really is within the Slovak education system. We will continue to point out the need for developing education, not the flatten ability of higher education degrees, the need to teach people to think critically and not to be false. Although the scientific community is largely engaged in critical thinking (Frederick, 2005; Aktaş & Ünlü, 2013; Fahim & Eslamdoost, 2014; Toplak, West, & Stanovich, 2014; Čavojová, 2016; Stoker, Hay, & Barr, 2016; Tay, Ryan & Ryan, 2016; Čavojová & Jurkovič, 2017), we would also recommend future researchers to focus on this factor in the context of education which we have tried to explore a little in this article.

References

Aktaş, G. S., & Ünlü, M. (2013). Critical thinking skills of teacher candidates of elementary Mathematics. *Social and Behavioral Sciences, 93*, 831-835. https://doi.org/10.1016/j.sbspro.2013.09.288

Armentano, R. L., & Kun, L. (2019). Leonardo da Vinci - The first bioengineer: Educational innovation to meet his desire for knowledge and promote his concept of interdisciplinarity. *Creative Education, 10*(6), 1180-1191. https://doi.org/10.4236/ce.2019.106089

Bajtoš, J., Lajčin, D., & Gabrhelová, G. (2020). Teaching professional technical subjects accepting current trends in field didactics. *Acta Educationis Generalis, 10*(1), 81-97. https://doi.org/10.2478/atd-2020-0006

Ballová Mikušová, E. (2019). Redukovanie nepodložených presvedčení pomocou kritického myslenia. In M. Jurkovič, V. Čavojová, & I. Brezina (Eds.), *Prečo ľudia veria nezmyslom* (pp. 165-182). Bratislava: Premedia.

Bašnáková, J. (2019). Múdre deti: ako sa vyvíjajú kritické myslenie a vedecké myslenie. In M. Jurkovič, V. Čavojová, & I. Brezina (Eds.), *Prečo ľudia veria nezmyslom* (pp. 217-245). Bratislava: Premedia.

Čavojová V., & Jurkovič M. (2017). Racionálni učitelia a intuitívni manažéri: Interakcia veku a kognitívnej reflexive pri rozhodovaní. In *Kognícia a umelý život* (pp. 30-37). Bratislava: Univerzita Komenského v Bratislave.

Čavojová, V. (2016). Good things do not happen to me.. but neither do the bad things: Comparative optimism and pessimism in a slovak sample. *Studia Psychologica, 58*(4), 286-306. https://doi.org/10.21909/sp.2016.04.724

Dancák, P. (2016). Disputationes quodlibetales. In *Ľudské konanie vo filozofickej reflexii Tomáša Akvinského* (pp. 6-18). Prešov: Prešovská Univerzita v Prešove.

Darwin, C. (1887). *The autobiography of Charles Darwin.* Collins.

Fahim M., & Eslamdoost S. (2014). Critical thinking: Frameworks and models for teaching. *English Language Teaching, 7*(7), 141-151. https://doi.org/10.5539/elt.v7n7p141

Frederick, S. (2005). Cognitive reflection and decision making. *Journal of Economic Perspectives, 19*(4), 25-42. https://doi.org/10.1257/08953300 5775196732

Harrison, R. P. (2009). What can you learn from Machiavelli? Retrieved from https://insights.som.yale.edu/insights/what-can-you-learn-machiavelli

Hrmo, R., Miština, J., & Krištofiaková, L. (2016). Improving the quality of technical and vocational education in Slovakia for European labour market needs. *International Journal of Engineering Pedagogy, 6*(2), 14-22. https://doi.org/10.3991/ijep.v6i2.5369

Jordaan, A., & Jordaan, D. (2005). A logical and structural thinking development tool (LST) to enhance fundmental problem-solving skills of learners of information technology. *The Journal of Trandisciplinary Research in Southern Africa, 1*(1), 59-76. https://doi.org/10.4102/td. v1i1.303

Jurkovič, M. (2019). Predslov. In M. Jurkovič, V. Čavojová, & I. Brezina (Eds.), *Prečo ľudia veria nezmyslom* (s. 7-11). Bratislava: Premedia.

Kahneman, D. (2011). *Myšlení rychlé a pomalé* (Vol. 1). Brno: Jan Melvil Publishing.

Krošlák, D. (2012). Sokratovská metóda ako pedagogická forma v procese vzdelávania právnikov. *Exemplo ducti*, 184-195. Retrieved from https://www.academia.edu/9899337/Sokratovsk%C3%A1_met%C3%B3da _ako_pedagogick%C3%A1_forma_v_procese_vzdel%C3%A1vania_pr%C 3%A1vnikov

Ritchhart, R., & Perkins, D. (8. 3 2020). *Harvard: Project Zero*. Retrieved from http://www.pz.harvard.edu/

Stoker, G., Hay, C., & Barr, M. (2016). Fast thinking: Implications for democratic politics. *European Journal of Political Research, 55*(1), 1-19. https://doi.org/10.1111/1475-6765.12113

Šnídl, V. (2017). *Pravda a lož na Facebooku* (Vol. 1). Bratislava: N Press.

Šrol, J. (2019). Čo sú to nepodložené presvedčenia a prečo im ľudia veria? In M. Jurkovič, V. Čavojová, & I. Brezina (Eds.), *Prečo ľudia veria nezmyslom* (s. 12-49). Bratislava: Premedia.

Tan, C. (2017). *Confucianism and Education*. https://doi.org/10.1093/acrefore/9780190264093.013.226

Tay, S. W., Ryan, P., & Ryan, C. A. (2016). Systems 1 and 2 thinking processes and cognitive reflection testing in medical students. *Canadian Medical Education Journal, 7*(2), 97-103.

Toplak, M. E., West, R. F., & Stanovich, K. E. (2014). Assesing miserly information processing : An expansion of the Cognitive Reflecton Test. *Thinking & Reasoning, 20*(2), 147-168. https://doi.org/10.1080/13546783.2013.844729

Pre-Service Elementary Teachers' Knowledge of Students: The Case of Subtraction

Sumeyra Dogan Coskun*

Abstract:

Introduction: Although there is ambiguity about the elements of teacher knowledge, all researchers accept that being able to anticipate what errors can be made, the reasons for and the strategies to overcome these errors, in short, the knowledge of students is important for student achievement. In this study, knowledge of students refers to being aware of students' possible errors and underlying reasons for these errors and knowing how to overcome these errors. Based on this consideration, the purpose of this study is to investigate pre-service elementary teachers' knowledge of students on the subtraction topic.

Methods: Considering the purpose, the data were collected from 118 pre-service elementary teachers who were enrolled in a four-year Elementary Teacher Education program via a task-based questionnaire related to the topic of subtraction and semi-structured interviews following the questionnaire. The task-based questionnaire included three completed incorrect subtraction tasks and was prepared considering the related literature and the elementary school mathematics curriculum of Turkey. Each task in the questionnaire contained a different type of error. The pre-service elementary teachers' answers to the task-based questionnaire were categorized as correct, partially correct, wrong, or no answer by means of categorical analysis. The pre-service elementary teachers who gave correct and partially correct answers to the tasks were asked to participate in the second part of the study to learn their possible strategies to overcome the errors made in the tasks.

Results: As a result of the quantitative and qualitative analysis of the pre-service elementary teachers' responses, it was found that their knowledge of students for subtraction is limited. Specifically, although the pre-service elementary teachers were partially able to identify the errors in the first and second task, they were not able to identify the error in the third task. Furthermore, they were better able to determine a more commonly occurring subtraction error compared to the uncommon ones. The pre-service elementary teachers could not identify the underlying reasons that led the students to the errors. They could not explain what conceptual

---

* Sumeyra Dogan Coskun, Eskisehir Osmangazi University, Department of Elementary and Early Childhood Education, Eskisehir, Turkey; s-dogan@ogu.edu.tr

knowledge related to the topic of subtraction the student lacked that resulted in the errors. As the pre-service teachers did not attain these reasons, they were not able to provide strategies to overcome these errors different than restating the rules or procedures to overcome students' errors.

Discussion: Only being able to identify the errors is not enough to make the instruction effective. Teachers also need to know and provide a rationale for why the errors happen and how to overcome them (Even & Tirosh, 1995). Contrary to this statement, the pre-service elementary teachers in this study could not attempt to understand the students' thinking or could not explain the reasons behind students' errors with the notion of subtraction. Son (2013) emphasizes that pre-service teachers tend to explain the reasons for students' errors as procedural. Similar to this emphasis, the pre-service teachers identified the errors as resulting from not applying procedures carefully or not enough knowing algorithms to find correct solutions. However, without addressing the reasons or focusing on procedures does not promote students' understanding of the related topic (An, Kulm, & Wu, 2004). The pre-service teachers' difficulties in identifying the possible conceptual reasons may result from deficits in knowledge of students (Fennema & Franke, 1992; Ball et al., 2008).

Limitations: The findings were limited with the responses of the pre-service elementary teachers participating in this study. Moreover, the pre-service elementary teachers' knowledge of students was investigated within the scope of subtraction.

Conclusions: Although the pre-service elementary teachers could identify students' errors on subtraction, they had difficulty in identifying the reasons and suggesting strategies to overcome the errors. Therefore, it can be concluded that the pre-service teachers' knowledge of students for the topic of subtraction is limited. An implication of this is that teacher educators need to include error-analysis tasks to help pre-service teachers be aware of the importance of their knowledge of students.

Key words: error, knowledge of students, pre-service elementary teachers, subtraction.

Introduction

To emphasize the importance of operations with numbers, the National Research Council [NRC] (2001) states "number is a rich, many-sided domain whose simplest forms are comprehended by very young children and whose far reaches are still being explored by mathematicians. Proficiency with numbers and numerical operations is an important foundation for further education in mathematics and in fields that use mathematics." The National Council of Teachers of Mathematics [NCTM] (2000) also accepts attaining numerical fluency in numerical operations as one of the essential components of

elementary mathematics education. In the same way, NRC (2001) lists procedural fluency among strands of mathematical proficiency. What is meant here by procedural fluency is not just performing or emphasizing necessary arithmetic computations. Instead, it refers to computing these calculations with a conceptual understanding (Cobb, 1991). That is, learning to perform algorithms with meaning refers to procedural fluency. It is a fact that teachers' knowledge impacts their teaching practices, hence students' procedural fluency. In this context, this study aims to investigate pre-service elementary teachers' knowledge of students on the subtraction topic.

1 Teacher knowledge

Since teacher knowledge is accepted as one of the characteristics of an effective teacher and an effective teacher may have the greatest influence on students' success in mathematics, there have been a number of studies related to it (Fennema & Franke, 1992). That is, to improve mathematics instruction, and hence to improve students' learning, a better understanding of teacher knowledge and its development is important (Ball, Thames, & Phelps, 2008). However, there are many different ideas as to what knowledge and skills constitute teacher knowledge. Shulman (1986) mentions that teachers need to have three categories of knowledge which are content knowledge, pedagogical content knowledge, and curricular knowledge. The first one, content knowledge, is defined as "the amount and organization of knowledge per se in the mind of the teacher." (Shulman, 1986, p. 9) Although content knowledge is important as it includes basic facts of a subject, how these facts are related to each other, and how they are verified, it is not enough to teach the subject. At this point, pedagogical content knowledge which is directly related to a teacher's ability to represent content in a way that students can easily understand the content is required. Specifically, Shulman (1986) defines pedagogical content knowledge as "the ways of representing and formulating the subject that makes it comprehensible to others." The last one, curricular knowledge refers to how the content plays out throughout the curriculum.

1.1 Mathematical knowledge for teaching

Since Shulman's framework was not specific for one subject, several studies have used his model and proposed their own models (Ball et al., 2008; Fennema & Franke, 1992; Grossman, 1990). One of these researchers, Ball and her colleagues (2008) identified the essential elements of knowledge to teach mathematics and designed a new model for mathematics teaching by extending Shulman's framework. They used a new term, Mathematical Knowledge for Teaching (MKT), which was defined as "the mathematical knowledge needed to carry out the work of teaching mathematics." (Ball et al., 2008, p. 395) As can be easily seen in Figure 1, subject matter knowledge and pedagogical content knowledge are two main domains of the MKT model.
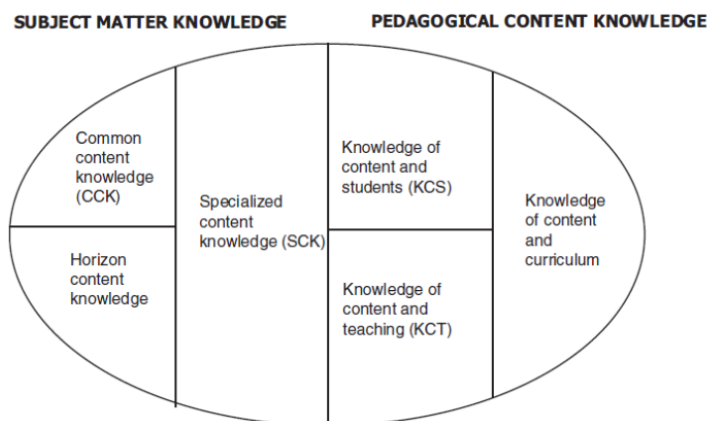
Figure 1. Model of mathematical knowledge for teaching (Ball et al., 2008, p. 403).

According to their model, subject matter knowledge includes common content knowledge, specialized content knowledge, and horizon content knowledge. The first sub-domain of the subject matter knowledge, common content knowledge, is the knowledge of any well-educated person which is not unique to teaching. On the other hand, specialized content knowledge is defined as "mathematical knowledge and skill uniquely needed by teachers in the conduct of their work." (Ball et al., 2008, p. 400) In other words, teachers with specialized content knowledge know how to clearly present ideas, effectively respond to their students' questions, and know which examples help students understand the content. Lastly, a teacher with horizon content knowledge links the content not only with the previous years but also with the following years.

Similar to the first domain of MKT, the second domain, pedagogical content knowledge is subdivided into three sub-domains: knowledge of content and teaching, knowledge of content and curriculum, and knowledge of content and students. Knowledge of content and teaching is "knowledge that combines knowledge about mathematics and knowledge about teaching." (Ball, et al., 2008, p. 401) This sub-dimension is related to the selection of tasks and order in which tasks are presented throughout instruction. Furthermore, teachers with this knowledge know both the advantages and disadvantages of models or representations used to solve tasks. The second sub-domain, knowledge of content and curriculum, is the knowledge of how teachers relate mathematics with mathematics curriculum. The last sub-domain, knowledge of content and students includes both knowledge of specific content and knowledge of students' thinking and learning process. That is, teachers with this knowledge are aware of students' understanding, conceptions, and errors for specific content (Ball, et al., 2008).

1.2 Rationale and purpose of the study

When the above-mentioned and the other models for teacher knowledge are examined in detail, despite the slight differences among them, it can be easily seen that most of them emphasize the knowledge of students and their learning (Ball et al., 2008; Grossman, 1990, Shulman, 1986). One of those aspects that affect students' learning is their errors. One of the topics in which students make errors is subtraction. Students commit errors in subtraction as they cannot apply the borrow operation (Imbo & LeFevre, 2010). Since they have difficulties in borrowing, they prefer to subtract the smaller number from the bigger one regardless of their places (NRC, 2002; Riccomini, 2005). The borrowing error is especially observed when one of the digits of the subtrahend is zero (Ashlock, 2002). Specifically, since students think that they cannot subtract a number from zero, they just write zero as a result. Contrary to students' errors and difficulties in subtraction, the topic of subtraction is one of the fundamental concepts of mathematics and the significance of the topic can be clearly seen throughout the elementary mathematics curriculum (Ministry of National Education, 2018; NCTM, 2000). Therefore, if teachers do not know how to teach subtraction both procedurally and conceptually to overcome students' errors and misconceptions, then students may fail to reach a higher level of mathematics.

In order to be able to help students gain a conceptual understanding of subtraction, teachers need to have knowledge of content and students. Contrarily, most of the pre-service elementary teachers think that if they teach mathematics directly by providing rules and algorithms, students would reapply them and be successful in mathematics. Hence, they just focus on their students' numerical answers by exploring whether they are right or wrong. However, NCTM (2000) emphasizes that teachers need to use their students' answers as an opportunity to enhance students' learning rather than to provide a superficial right or wrong reply. Therefore, teachers need to provide opportunities for their students to explain their answers and thoughts, and ask questions related to their answers (Lukášová & Pavelková, 2017; Trávníčková, 2018). Otherwise, they may not be able to identify the points that need to be re-addressed or make invalid conclusions regarding their students' understanding. Contrary to this emphasis, they do not question or look for underlying reasons for their students' wrong answers and do not know how to overcome these errors (Crespo, 2000; Tirosh, 2000). Furthermore, some of them even tend to hide their students' errors (Son & Sinclair, 2010). Then, the first natural question that comes to mind will be how teaching can be effective without overcoming students' errors. In fact, teachers may use these errors as an instructional source to help students learn the subtraction conceptually by asking students to explain the errors that they made (Curry, 2004; Große & Renkl, 2007). To state differently, allowing students to explain why their answers are not right, or how they can correct their errors may help them reflect on what they did and why they did and then foster a deeper understanding of the subtraction. Throughout these processes, teachers

may try to interpret by identifying the specific features of their students' errors and plan how to deal with them (Larrain & Kaiser, 2019). However, to be able to succeed in the above-mentioned processes, the first step is teachers' examination of students' answers (Ashlock, 2002).

As mentioned before, although there is ambiguity about the elements of teacher knowledge, all researchers accept that being able to anticipate what errors can be made, the reasons for and the strategies to overcome these errors, in short, the knowledge of students is important for student achievement (Brodie, 2014; Ma, 1999; Peng & Luo, 2009). In this study, knowledge of students refers to being aware of students' possible errors and underlying reasons for these errors and knowing how to overcome these errors. Based on this consideration, this study aims to examine whether or not pre-service elementary teachers identify and overcome students' errors related to the subtraction. Apart from forcing the participants of this study to think deeply about students' errors not only related to subtraction, but they would also think about other mathematics topics as well.

2   Methodology

2.1   Research design

Qualitative studies try to understand "the meaning people have constructed: that is, how they make sense of the world and the experiences they have in the world." (Merriam, 1998, p. 6) A case study, one of the types of qualitative studies, is preferred when the researchers try to get a detailed understanding of the related issue (Creswell, 2007). To gain a deeper understanding of the pre-service elementary teachers' knowledge of students' errors on the topic of subtraction, a case study design was used. In this study, while senior pre-service elementary teachers are the case, knowledge of students' errors is the unit of analysis of the study.

2.2   Participants

The data of this study were collected from pre-service elementary who were enrolled in a four-year Elementary Teacher Education program at a university in Turkey. The pre-service elementary teachers took two content courses focusing on basic facts of mathematics and two teaching courses focusing on instructional methods and strategies for teaching these facts. Since the qualitative case studies do not aim to generalize findings, instead, try to get a deeper understanding of the case, purposive sampling, one of the non-probabilistic sampling methods, was used to select the participants of this study. To see whether or not pre-service elementary teachers have enough knowledge to overcome their students' errors related to the subtraction following their graduation, the senior pre-service elementary teachers who had already taken both content and teaching courses were asked to volunteer to participate in this study. There were 118 pre-service

elementary teachers who accepted to be a volunteer in this study during the fall semester of the 2018-2019 academic year.

2.3 Data collection

To get detailed information related to pre-service elementary teachers' knowledge of students' errors on the subtraction, the data were collected via a task-based questionnaire related to the topic of subtraction and semi-structured interviews following the questionnaire. The task-based questionnaire including three completed incorrect subtraction tasks was prepared by the author of this study considering the related literature and the elementary school mathematics curriculum of Turkey. Incorrect tasks in the worksheet were representative of errors made by elementary school students for the topic of subtraction. To determine the content validity of the questionnaire, the prepared tasks were controlled by a mathematics educator and an elementary school teacher.

Since this study tries to investigate pre-service elementary teachers' knowledge of students' errors, pre-service teachers were asked to explain students' solutions and errors on each task in detail. Furthermore, each task contained a different type of error. For example, there were two types of errors in the first task. The first one was a very common type of error, was called "smaller from larger error (SFLE)." (Ashlock, 2002) If a student subtracted a smaller digit from a bigger digit in the same column regardless of which is on top, then it was called SFLE (e.g. 52-37=25, with the SFL error 7-2=5). The second error in this task was related to borrowing a ten, which was called "forgetting to decrease the value (FDV)." That is, if a student could not subtract the numbers in the ones place, he had to borrow a ten from tens place. However, the student forgot to decrease value of the digit by one in the tens column (e.g. 52-37=25, with the FDV error 12-7=5 and 5-3=2). There were also two types of errors which were called "borrowing tens error (BTE)" and "arithmetic error (AE)" in the second task. If a student borrowed a ten from tens place and forgot to add this ten to digit in the ones place, then it was called BTE (e.g., 81-52=28, with the BTE 10-2=8). If a student borrowed a ten from tens place, added this ten to digit in the ones place; however, the student made an arithmetic error in the subtraction, then it was called as AE (e.g. 81-52=28, with the AE 11-2=8). The final error in the third task was called "no need to borrow (NNTB)." Although there was no need to borrow a ten from tens place, the student borrowed a ten and added this ten to the digit in the ones place. By the way, he also decreased the value of the digit by one in the tens place of the minuend. Then he subtracted the digit in the ones place of subtrahend from the digit in the ones place of minuend and carried the ten into the tens place of subtrahend (e.g. 95-32=43, with the NNTB 15-2=13 and 85-42=43). The subtraction tasks and errors of the students in each task are given in Table 1.

Table 1

Subtraction tasks in the task-based questionnaire and classification of errors

Subtraction task	Type of error
52 − 37 25	smaller from larger error (SFLE) forgetting to decrease the value (FDV)
7 1 81 − 52 28	borrowing tens error (BTE) arithmetic error (AE)
8 1 95 − 1 32 43	no need to borrow (NNTB)

To understand the pre-service elementary teachers' thoughts and to get a complete picture of their knowledge of students' errors related to the subtraction, semi-structured interviews were also conducted with 25 of the senior pre-service elementary teachers. Most of the interview questions were related to the pre-service elementary teachers' previous answers given to the tasks in the task-based questionnaire. Specifically, if the pre-service elementary teachers were able to correctly identify the errors in the tasks, then they were asked the reasons for these errors and strategies that can be used to overcome these errors.

2.4 Data analysis
The first stage of the data analysis process was examining the pre-service elementary teachers' answers to the task-based questionnaire. Their answers were categorized as correct, partially correct, wrong, or no answer by means of categorical analysis. Specifically, if the pre-service elementary teachers identified the errors and explained them in detail using the correct terminology, their answers were coded as correct. On the other hand, if the pre-service elementary teachers could not use the correct terminology and their answers lacked enough explanation, then their answers were coded as partially correct. When they could not identify the errors correctly, their answers were coded as incorrect and as blank for they could not give an answer.
Then, the pre-service elementary teachers who gave correct and partially correct answers to the tasks were asked to participate in the second part of the study to learn their possible strategies to overcome the errors made in the tasks. The semi-structured interview questions were prepared for each of the pre-service elementary teachers who were the volunteers to conduct interviews. That is, the questions asked throughout the interviews could be different from one another. The pre-service elementary teachers' answers were scored both by the researcher and a graduate student for the reliability of the scores. The researcher and the

graduate student scored randomly selected 50% of pre-service elementary teachers' answers independently and calculated the inter-scorer reliability.

3   Findings

The findings of this study were presented in three sections considering the tasks given in the task-based questionnaire, namely, the identification of the errors for the first task, the identification of the errors for the second task, and the identification of the errors for the third task, respectively.

3.1   The identification of the errors for the first task

From Table 2, the analysis of the pre-service elementary teachers' answers shows that most teachers identified an SFL error as the only error while four of the teachers determined there were both SFL and FDV errors.

Table 2

Frequency (and percentage) of pre-service elementary teachers' answers for the first task

Subtraction task	Correct f	Partially correct f	Wrong f	No answer f
$\begin{array}{r} 52 \\ -\ 37 \\ \hline 25 \end{array}$	4 (3%)	111 (94%)	2 (2%)	1 (1%)

When the pre-service elementary teachers who identified both types of errors made in the first task were interviewed, it was seen that they could not use the correct terminology while explaining these errors. For example, one of these teachers stated that:

The student knows that s/he cannot subtract 7 from 2. So s/he is taking a 10 in the tens place and adds it to 2 in the one's place. Now s/he subtracts 7 from 12 which equals 5. However, s/he forgets that 5 becomes 4. So s/he subtracts 3 from 5 and finds 2 which is wrong.

Although the pre-service elementary teachers listed different reasons for the errors made in the first task without explaining them deeply enough, most of their explanations related to the SFL error. Furthermore, one of the pre-service elementary teachers mentioned that she does not know the exact reason for the SFL error; however, it may result from teachers' explanations. Specifically, she stated that:

Most of the time teachers say that you cannot subtract a big number from a small number. So the student may think that s/he can subtract the small number from the big number irrespective of their place. That is, the student may subtract 2 from 7 and find 5 which is again wrong.

Similarly, another pre-service elementary teacher mentioned that:

Teachers in elementary schools always say that we have to check whether or not the big number is on top. If the number on top is bigger than the bottom, then we can find the difference. Otherwise, we cannot subtract the numbers.

When examining the pre-service elementary teachers' strategies to overcome the errors made in the first task, none of them focused on the students' errors. Instead, they mentioned that their strategy would be to give similar subtraction tasks to the students several times and to expect that the students will subtract correctly. An excerpt from one of the pre-service elementary teachers' interview was given below:

Actually, students know that they cannot subtract bigger numbers from smaller numbers; however, since some of them have a partial understanding of the subtraction, they make similar errors. Thus, I need to make sure to review the subtraction rules and make students practice subtraction problems.

Considering the pre-service elementary teachers' answers for the first task, it can be concluded that their explanations about the reasons for students' errors and possible strategies to handle these errors were not much different from each other. Rather than mentioning possible reasons related to students' thinking as well, nearly all of the pre-service elementary teachers accepted teachers' explanations as a possible reason for students' errors. As evidenced by pre-service elementary teachers' statements, their strategies were not focused on conceptual understanding, rather they were procedure-oriented. Due to the lack of their pedagogical explanations, it can be concluded that their knowledge of students' errors for the first task is somewhat limited.

3.2 The identification of the errors for the second task

Similar to the first task, both error types which were BTE and AE in the second task were determined by only 4 out of 118 pre-service elementary teachers. Furthermore, 20 of these elementary teachers could not find the error.

Table 3

Frequency (and percentage) of pre-service elementary teachers' answers for the second task

Subtraction task	Correct f	Partially correct f	Wrong f	No answer f
$\begin{array}{r} 71 \\ \cancel{8}\cancel{1} \\ -52 \\ \hline 28 \end{array}$	4 (3%)	94 (80%)	14 (12%)	6 (5%)

Even among those 94 pre-service elementary teachers who identified one of these errors, only 10 of them determined the BTE error, showing a lack of

knowledge considering the students' errors related to the subtraction. For the BTE, one pre-service elementary teacher mentioned that:

The student knows that he cannot take 2 from 1. So s/he is taking a 10 in the tens place; however, s/he forgets to add this ten to digit 1 in the ones place. That is, the student subtracts 2 directly from 10 and gets 8.

For the AE, the pre-service elementary teachers think that the student knows to borrow and add this 10 to the digit in the ones place, 1 in this task. According to them, the only error is an arithmetic error which means that the student made this error by a fault. That is, the pre-service elementary teachers did not attribute the error to forgetting to add 10 to the digit in the ones place. Since these teachers think that this fault might rarely occur, they claim that asking students to check if they subtracted correctly would be an effective strategy to overcome this error. When they were asked to mention other strategies to address the error, they could not come up with anything.

Apart from the explanations given above, what was interesting but not necessarily correct was that some of the pre-service elementary teachers provided their explanations for the error made in the second task. Some of their explanations were given below:

The student does not know subtraction. First, s/he multiplies the digits in the ones place which are 1 and 2 and writes the result (2) in the tens place of the result. Then, s/he multiplies with 8 and 1 and writes the result (8) in the ones place of the result.

The student thinks that subtraction is related to a big and a small number. S/he takes the bigger digit of minuend and writes it in the ones place of the result. Then s/he takes the smaller digit of the subtrahend and writes it in the tens place of the result.

The student borrows 9 instead of 10 and adds 9 to 1 in the ones place of the minuend.

The student borrows 10 and adds this 10 to 1 in the ones place of the minuend. Then the student subtracts 2 from 11 and finds 9 as a difference. However, since the student got a 1 at the beginning, s/he has to subtract this 1 again from 9 which is 8.

The student knows that he cannot subtract 2 from 1. Although s/he knows that he has to borrow, s/he does not know where he borrows from. He decreases the value of the digit by one in both ones and tens place of minuend.

By considering the pre-service elementary teachers' answers for the second task, this study might mean that although the pre-service elementary teachers were partially able to identify students' errors, they could not provide explanations on how they would overcome these errors. Instead, some of them mentioned that they would re-teach how the subtraction algorithm works. Showing students the algorithms may bring the correct answers for the subtraction problems; however, it does not mean that they would understand the reasons for their errors. Therefore, it can be stated that the pre-service elementary teachers had limited

knowledge of students' thinking as their explanations regarding the strategies were limited.

3.3 The identification of the error for the third task

When the pre-service elementary teachers' answers for the third task were analyzed, it was seen from Table 4, there were not any correct or partially correct answers. Therefore, it can be said that they had difficulties in determining the student's error in the third task compared to the first and second tasks. In fact, 67% of them made a wrong explanation for the error and 33% of them could not give an explanation for it. The frequency and percentage of their answers were presented in Table 4.

Table 4

Frequency (and percentage) of pre-service elementary teachers' answers for the third task

Subtraction task	Correct *f*	Partially correct *f*	Wrong *f*	No answer *f*
$\begin{array}{r} ^{8}_{9}{}^{1}_{5} \\ -\ _{1}32 \\ \hline 43 \end{array}$	0 (0%)	0 (0%)	79 (67%)	39 (33%)

As none of the pre-service elementary teachers identified the error in the third task, some of the wrong explanations were given below:

The student subtracts 2 from 5 in the correct way. Then s/he thinks that s/he has to borrow a ten and add this 10 somewhere. Since s/he subtracted the digits in the ones place, s/he borrows a 1 and adds it to 3 (the digit in the ones place of subtrahend) which equals to 4. Finally, s/he subtracts 4 from 8 and writes the difference as 43.

Although the student subtracts the digits in the ones place accurately, s/he could not subtract the digits in the tens place. S/he may be a bit careless.

The student thinks that s/he has to borrow a ten from a tens place of minuend for both the digit in the ones place of minuend and the digit in the tens place of the subtrahend.

The student subtracts the digits in the ones column. However, when he looks to the digits in the tens column, he thinks that he has to subtract 9 from 3 and he knows that he cannot subtract. So he takes a ten from 9 and adds this 10 to 3 to make 13. Then he subtracts 9 from 13 and gets 4 for the digit in the tens place of the difference.

The student thinks that he has to borrow a ten from a tens place of minuend for both the digits in the ones place of minuend and subtrahend.

Since the pre-service elementary teachers were not able to identify the error in the third task, none of them were interviewed in the second part of the study to

find out how they can overcome the error in the third task. Therefore, with respect to the third task, the most outstanding finding was the pre-service elementary teachers' weakness in both identifying and overcoming the error.

4 Discussion and implications

This study examined the pre-service elementary teachers' knowledge of students for the topic of subtraction. The findings indicated that although the pre-service elementary teachers were partially able to identify the errors in the first and second task, they were not able to identify the error in the third task. Considering the first and second tasks, they were better able to determine a more commonly occurring subtraction error which was SFL and AE. On the other hand, they had difficulty in determining less common subtraction errors which were FDV and BTE in the first and second tasks, respectively. Therefore, the reason for not being able to identify the error in the third task may result from the type of error as the error in the third task was not a common one. Actually, identifying the most common errors is important as students would possibly make these errors (Resnick, 1982). However, being able to identify the errors is not enough to make the instruction effective. Teachers also need to know and provide a rationale for why errors happen and how to overcome them (Even & Tirosh, 1995). Contrary to this statement, the pre-service elementary teachers in this study could not attempt to understand the students' thinking or could not explain the reasons behind students' errors with the notion of subtraction. Specifically, they could not explain what conceptual knowledge related to the topic of subtraction the student lacked that resulted in those errors. Son (2013) emphasizes that pre-service teachers tend to explain the reasons for students' errors as procedural. Similar to this emphasis, the pre-service teachers identified the errors as resulting from not applying procedures carefully or not enough knowing algorithms to find correct solutions. However, without addressing the reasons or focusing on procedures does not promote students' understanding of the related topic (An, Kulm, & Wu, 2004). The pre-service teachers' difficulties in identifying the possible conceptual reasons may result from deficits in their knowledge of students (Fennema & Franke, 1992; Ball et al., 2008). As the pre-service teachers did not attain these reasons, they were not able to provide strategies to overcome these errors. They just suggested presenting the rules, showing how to carry out the subtraction algorithm again, and providing some other tasks. Teachers who lack instructional strategies' knowledge tend to think that restating the rules and having students practice similar tasks would help them overcome students' errors (Fennema & Franke, 1992; Kinach, 2002). Considering this statement, it can be concluded that the pre-service teachers' knowledge of students for the topic of subtraction is limited.

Conclusions

This study provides practical implications as it shows the important role of teacher educators and teacher education programs. Specifically, Cuban (1993) states that teachers tend to teach in a similar way in which they had been taught. Therefore, to make pre-service elementary teachers familiar with, and help them provide an effective instruction to overcome, mathematics teaching courses in the teacher education programs can be reorganized in a way that they include some information about students' errors. For example, teacher educators can include similar tasks to the ones given in this study and create an environment in which pre-service teachers engage in identifying and providing strategies to deal with errors. Including these tasks would not only allow teachers to learn common student errors, but also allow them to notice the importance of these errors as a source of their students' mathematical thinking. That is, by means of these tasks, pre-service teachers learn how to think about mathematics from a student's perspective in addition to a teacher's perspective. The findings of this study call for future studies examining pre-service elementary teachers' knowledge of students on other topics of mathematics to inform teacher educators.

References

An, S., Kulm, G., & Wu, Z. (2004). The pedagogical content knowledge of middle school, mathematics teachers in China and the US. *Journal of Mathematics Teacher Education*, *7*(2), 145-172.

Ashlock, R. B. (2002). *Error patterns in computation* (8th ed.). New York: Merrill.

Ball, D. L., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education, 59*(5), 389-407.

Brodie, K. (2014). Learning about learner errors in professional learning communities. *Educational Studies in Mathematics*, *85*(2), 221-239.

Cobb, P. (1991). Reconstructing elementary school mathematics. *Focus on Learning Problems in Mathematics, 13*(2), 3-32.

Crespo, S. (2000). Seeing more tan right and wrong answers: Prospective teachers' interpretations of students' mathematical work. *Journal of Mathematics Teacher Education, 3*(2), 155-181.

Creswell, J. W. (2007). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Cuban, L. (1993). *How Teachers Taught: Constancy and Change in American Classrooms 1890-1990* (2nd ed.). New York: Teachers College Press.

Curry, L. A. (2004). The effects of self-explanations of correct and incorrect solutions on algebra problem-solving performance. In K. Forbus, D.

Gentner, & T. Regier (Eds.), *Proceedings of the Annual Meeting of the Cognitive Science Society, 26*(26). Mahwah, NJ: Erlbaum.

Even, R., & Tirosh, D. (1995). Subject-matter knowledge and knowledge about students as sources of teacher presentations of the subject matter. *Educational Studies in Mathematics, 29*(1), 1-20.

Fennema, E., & Franke, M. L. (1992). Teachers' knowledge and its impact. In D. A. Grouws (Ed.), *Handbook of Research on Mathematics Teaching and Learning: A Project of the National Council of Teachers of Mathematics* (pp. 147-164). New York, NY, England: Macmillan Publishing Co, Inc.

Fuson, K. C. (1992). Research on whole number, addition and subtraction. In D. A. Grouws (Ed.), *Handbook of Research on Mathematics Teaching and Learning* (pp. 243-295). New York: Macmillan Library reference Simon & Schuster Macmillan.

Große, C. S., & Renkl, A. (2007). Finding and fixing errors in worked examples: Can this foster learning outcomes? *Learning and Instruction*, *17*(6), 612-634.

Grossman, P. L. (1990). *The Making of a Teacher: Teacher Knowledge and Teacher Education.* New York: Teachers College Press, Columbia University.

Imbo, I., & LeFevre, J. A. (2010). The role of phonological and visual working memory in complex arithmetic for Chinese- and Canadian-educated adults. *Memory & Cognition, 38*(2), 176-185.

Kinach, B. M. (2002). A cognitive strategy for developing pedagogical knowledge in the secondary mathematics methods course: Toward a model of effective practice. *Teaching and Teacher Education, 18*(1)*,* 51-71.

Larrain, M., & Kaiser, G. (2019). Analysis of students' mathematical errors as a means to promote future primary school teachers' diagnostic competence. *Uni-Pluri/Versidad, 19*(2), 17-39.

Lukášová, H., & Pavelková, M. (2017). Pupils' Questions in Dialogic Teaching from the Perspective of Pedagogical Research. *Acta Educationis Generalis*, *7*(3), 76-87. https://doi.org/10.1515/atd-2017-0025

Ma, L. (1999). *Knowing and Teaching Elementary Mathematics: Teachers' Understanding of Fundamental Mathematics in China and the United States*. Mahwah, NJ: Lawrence Erlbaum Associates.

Merriam, S. B. (1998). *Qualitative Research and Case Study Applications in Education*. San Francisco: Jossey-Bass.

Ministry of National Education [MoNE]. (2018). *Mathematics Program for Elementary and Middle School.* Ankara: Devlet Kitapları Müdürlüğü.

National Council of Teachers of Mathematics. (2000). *Principles and Standards for School Mathematics*. Reston, Virginia: National Council of Teachers of Mathematics.

National Research Council. (2001). *Adding It Up: Helping Children Learn Mathematics*. Washington, DC: National Academy Press.

Peng, A., & Luo, Z. (2009). A framework for examining mathematics teacher knowledge as used in error analysis. *For the Learning of Mathematics*, *29*(3), 22-25.

Resnick, L. B. (1982). Syntax and semantics in learning to subtract. In T. P. Carpenter, J. M. Moser, & T. A. Romberg (Eds.), *Addition and Subtraction: A Cognitive Perspective* (pp. 136-155). Hillsdale: Erlbaum.

Riccomini, P. J. (2005). Identification and remediation of systematic error patterns in subtraction. *Learning Disability Quarterly, 28*(3), 233-242.

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4-14.

Son, J. W. (2013). How pre-service teachers interpret and respond to student errors: Ratio and proportion in similar rectangles. *Educational Studies in Mathematics, 84*(1), 49-70.

Son, J. W., & Sinclair, N. (2010). How pre-service teachers interpret and respond to student geometric errors. *School Science and Mathematics*, *110*(1), 31-46.

Tirosh, D. (2000). Enhancing prospective teachers' knowledge of children's conceptions: The case of division of fractions. *Journal for Research in Mathematics Education, 31*(1), 5-25.

Trávníčková, P. (2018). An analysis of teacher's didactical activity in the context of children's preconception usage. *Acta Educationis Generalis*, *8*(2), 40-53. https://doi.org/10.2478/atd-2018-0010

Young, R. M., & O'Shea, T. (1981). Errors in children's subtraction. *Cognitive Science, 5*(2), 153-177.

Perceived Teachers' Justice and
Perceived Teachers' Authority

Radka Čopková*

Abstract:

Introduction: The presented study discusses the issues of teacher's authority, its building and maintaining in the context of teacher's justice. The main question to be answered is how high school students perceive teachers as authorities in relation with their perception of teacher's justice.

Purpose: The aim of the present article is the identification of the relationship between perceived teachers' justice and perceived teachers' authority among Slovak high school students.

Methods: 159 Slovak high school students (120 males and 39 females) have participated in our study. Their average age was 17.2 years. The students have attended 3 kinds of high school - technical (49.7%), services (31.4%), and general (18.9%). Two questionnaires were administrated - Teacher Justice Scale (Dalbert & Maes, 2002) and Measurement for Omnisicient Authority Beliefs (Zhou, 2007). Data were examined by Pearson correlation, t-test and ANOVA.

Results: The results have shown the significant positive relationship between perceived teachers' justice and perceived teachers' authority. No gender differences were identified. There are significant differences in general perceived teacher's authority among secondary school students depending on their specialization - technical, services and grammar.

Discussion: Results of the study support previous findings of Cseri (2013) and Gavora (2007) who point out the importance of teachers' justice in building positive learning environment that support students'motivation to learn.

Limitations: The proportion of male and female participants was not equal. Also the proportion of participants divided by school specialization was not equal.

Conclusion: Accessing students fairly is not an easy task for any teacher, since perception of oneself as righteous may differ greatly from the perception of this apparent righteousness by individual students, who naturally dispose interindividual differences. It is extremely important that teachers pay attention to this fact not only at secondary schools but at all

---

* Radka Čopková, Technical University of Košice, Department of Engineering Education, Košice, Slovakia; radka.copkova@tuke.sk

levels of the educational system, which is one of the basic pillars of public administration.

1 Authority

The term "authority" has its roots in the Latin word "auctor", which is defined as a facilitator, guide, supporter, but also a pattern or example. The Latin word "auctoritas" is derived from this word, which after translation into Slovak can be understood as support, certainty, strength, power, reliability (Kábrt, 2000), influence, credibility or importance of the individual (Beck, 2007). Dunn (2011) has perceived the authority at spiritual level. According to his attitude, authority can be perceived as a bearer's internal strength enabling him to make decisions with the feeling of absolute certainty. The necessity of the study of the concept of authority is emphasized by Kitchen (2014). He claimed the pedagogical, philosophical and also political aspects to be taken into account when defining authority.

According to Kosová (2014), authority can be understood as a social relationship between the holders of respect and regard and those who show respect and regard. The bearer is considered to be an individual with undeniable competences and qualities, as a result of which he is given the ability to be a role model, a leader, a representative of certainty and support. As a result, individuals are influenced by thinking and behavioral authority. Therefore, it is essential that the authority acts responsibly and does not abuse his or her position for manipulation.

Barboráková (2012) lists the following types of authorities:
- *the genuine authority* is permanent and is characterized by respect for decisions and strategies by subordinate individuals;
- *the alleged authority* is typical in groups of distrust; the subordinates are unwilling to cooperate and the bearer of the authority does not have the necessary support;
- *the natural authority* is based on personality traits and professional experience; although it is difficult to build it, its loss can be very rapid;
- *the acquired authority* is closely linked to the natural authority, but in addition to the parameters already mentioned, purposefulness is important;
- *the personal authority* is achieved by the natural influence of the individual resulting from the individual's personal qualities and abilities;
- *the position authority* results from the individual's position in the organization;
- *the functional authority* is typical for an individual depending on performance quality of tasks related to his / her function;

- *the formal authority* is closely related to the individual's position in society and to his / her activities resulting from that position;
- *the informal authority* is mainly linked to the role of person and is based on the human and professional qualifications of the individual; this means that the person does not gain authority solely on the basis of personality traits and preparation for the working process, but primarily through the ability to build relationships with subordinates;
- *the statutory authority* is acquired automatically by the assignment of the function and is directly dependent on the strength and degree of inclusion in the organizational hierarchy;
- *the charismatic authority* is conditioned by the relationship to the people and the personal behavior of the individual, reflecting on the power of the personality;
- *the professional authority* is characterized as an authority acquired through professional knowledge;
- *the moral authority* is based on honest dealing with other people and is closely related to the character and humanity of the individual.

1.1 Teacher's authority

Teacher and students are the main participants in the teaching and learning process. It is the teacher who is responsible for education and formal nurturing. Teacher is a professionally qualified pedagogue who is an integral part of a complex system of interpersonal relationships. The teacher is responsible for the course of the teaching process, from personal preparation through class management to achievement of students. Together with student, teacher is the part of the creation of a class climate. Teacher can influence, plan, organize the lesson, but also solve conflicts among students, while trying to respect students' needs and communicate with them openly and flexibly (Vašašová, 2017).

During the teaching process the teacher can act as an authority only if students accept him or her. The teacher is an important factor in the educational process who can influence the behavior of pupils in the school and outside the school. Similarly, the social climate of the class is positively or negatively influenced by the authority of the teacher (Vašašová, 2017).

As the pioneer of teacher's authority problem is considered to be W. W. Jackson, who had already carried out ethnographic research in 1968 in which he tried to draw attention to the relationship between authority and respect for rules in the school environment. The author stated that management, regularity and rules are very helplful in building teachers' authority in the classroom.

Other authors who agree with his opinion share the above-mentioned factors of authority building with minor variations. Kolár (2009) puts forward the hypothesis that many of the duties and tasks that are associated with students' learning process can only be mastered if student learns to respect order, follow the rules and be responsible for own behavior. Based on this, the author

considers the order, law and duty to be the most important principles of the teacher's authority.

As mentioned before, authority is understood as an individual's unique position acquired on the basis of knowledge, experience and work results. In the case of a teacher, we speak mainly about two types of the authority. Formal authority is acquired by the teacher on the basis of his/her professional status. Informal authority is acquired by the teacher due to his/her abilities, skills and personality (Zimová, 2013). A common feature of both types of authority mentioned above is that the teacher should not enforce authority through power (prohibition, punishment), but should naturally build it through relationships and influence. The teacher, as an authority, should strengthen, build and work on his/her own competences. The aim of the educator should not only be to promote one's own authority, but also to encourage students to build their own authority. Teacher who is able to respect students is perceived as a teacher who is on top of the things. This allows him/her to understand the relationship between student and teacher as complementarities and not as asymmetry between dominance and submissiveness (Zimová, 2013). The teacher, perceived by students as a formal authority, is able to evolve through his/her relationship with the pupils and eventually become perceived as a personal authority. However, this process may take several months (Koníčková, 2017). A teacher who is a natural authority for the students is able to join the class team what makes it easier for students to solve specific situations. The aforementioned natural authority of the teacher also enables the students to develop their abilities and helps to follow the rules that pupils set together with the teacher (Zimová, 2013).

In 2014, a total of 549 pupils from primary and secondary schools attended a study in Czech Republic. The results of the study showed that primary school pupils have more frequent problem with the respect for authority than secondary school students. Students from secondary vocational schools had a problem with respecting the teacher as an authority. Students from grammar schools worked best with teachers. Similar results were obtained from the study conducted in Slovakia (Zemaníčková, 2014).

1.2 Building and maintaining the authority

Every teacher should be aware that if he or she starts teaching in a new class where students do not know him or her, he or she must act primarily as a formal authority. When teachers make it clear that they need to be respected as a formal authority, students will understand that it is necessary in order to acquire knowledge (Koníčková, 2017). However, building a formal authority is not an easy process. The fact is that students accept the teacher's authority easier when teacher assert its with confidence. The teacher should be confident in the first contact with the students and should also guide the learning process in confident way. A teacher who stands straight with his shoulders relaxed, with confidence in his voice, and with eye contact with students, is more confident for them. This

is confirmed by the fact that authority is mainly enforced by the body language (Ušálová, 2011).

A teacher for whom building and maintaining authority is important should follow three guiding principles:

- *proximity* - the student accepts the instruction more easily when the teacher is standing near him or her and speaks calmly rather than when shouting at him or her throughout the classroom;
- *visual contact* - when communicating with a student it is important that the teacher looks into his or her eyes; prolonged eye contact can enhance teacher's influence more significantly; eye contact is also important when students start to disturb; if the teacher stands up from the table and starts to move around the classroom, looking at the distracting students directly in the eyes, he can often calm the situation without a word;
- *style of communication* - in the case of students who refuse to communicate, it is more effective than a scream; if the teacher stands directly in front of the student and asks him, "Why don't you work?", the student starts to cooperate more easily (Koníčková, 2017).

A teacher who has built up a formal authority and who has experience in teaching can also gain personal authority. However, it is not easy to gain the respect of students. The teacher should not forget the following:

- appreciate the student's efforts to learn something new;
- show interest in the student, his or her views, attitudes, feelings;
- not to ridicule the student, to have patience with him or her to show him or her normal respect;
- establish clear rules that students must follow; students must know what follows if they break the rule;
- use procedures to enable students to be involved in the teaching process (Ušálová, 2011).

Pupils are much more responsive to a teacher who calls them by their first name, can say "thank you" and "please", have a professional approach to teaching and smiles sometimes. The process of creating the personal authority of a teacher is a lengthy plot and therefore the teacher should not try to please the students at all costs. The pursuit of exaggerated friendship can lead students to treat teachers as self-imposed and not as an authority (Koníčková, 2017). In addition to the above rules, it is important that every teacher who wants to be an authority for students is aware that in addition to their own duties and respect for student's rights, they also have their rights. In addition to the respect and discipline the students should require, the teacher also has the right to have the students silently and listen to them during the presentation (Ušálová, 2011).

2 Justice

The term "justice" is a frequently used term in many scientific disciplines - law, history, sociology, economics, psychology or pedagogy. The widespread application is due to the fact that the concept of "justice" has very quickly been adopted by the lay public. It is therefore not strange that the term "justice" is currently closely associated with adjectives such as ethical, environmental, political, intergenerational, gender and others.

Justice is defined in two respects by Dworkin (2001). The concept of justice can be seen as an equal distribution of a certain resource, burden or opportunity, but also an individual's right to be treated with the same attention and respect as everyone else. Therefore, equality and parity should be at the heart of justice. According to Rawls (1999), every human being can form, re-evaluate and intelligently promote his own perception of goodness, and he also has a sense of justice. It is the sense of justice that includes the ability to judge actions and circumstances as right or wrong. For this reason, the issue of justice needs to be discussed not only from a political but also a moral perspective, while emphasizing that every concept of justice is dependent on a specific moral or ideological standpoint.

2.1 Teacher's justice

Turek and Albert (2005) characterized the personality traits and educational features of the so-called "good teacher." They agreed that one of the most important teacher's personality traits is justice. Therefore, the teacher should be aware that in addition to the purposeful educational influence, students are also affected by their spontaneous behavior. In order for a teacher to fulfill his or her work goals, it is essential that the teacher gains respect and trust. Only a teacher who is accepted by students can positively influence them. It is fairness, as one of the most important professional teacher's characteristics that enables the teacher to achieve these goals.

On the other hand, injustice is one of the easiest ways how teacher can lose the authority. The issue of teacher's justice is serious and, according to Vališová (2008), some teachers manipulate students through justice. A teacher who puts himself or herself in the position of the "only righteous" one acts as a judge who only knows what is and what is not good. His or her aim is to induce feelings of remorse, failure and disappointment in students if they do not work as requested by the teacher.

The fact is that a good teacher should treat all students equally. Teacher should not favor any group of students and ignore others. Similarly, student assessment is closely linked to teacher's equity, and the teacher should be able to assess students objectively, ideally through multiple forms of assessment. But the teacher should not forget that students perceive justice from several points of view. Therefore, students expect the teacher to be fair not only in assessing their performance, but also in resolving conflicts that arise in the classroom between

students. Students also require that the teacher treats everyone equally and that he or she fairly assigns tasks related to the organizational aspect of the lesson (Čonková, 2015).

Rötling (2004) presents six values describing a fair assessment of pupils according to an individual relationship standard, based on the following principles:

1. freedom and responsibility - a student can only take responsibility for his or her own learning if he or she has got enough freedom and the opportunity to realize it from the teacher;
2. trust in student's growth - the teacher favors a positive assessment of the student and builds it on the positive assumption that the student will achieve better results tomorrow than today;
3. accepting the individuality of each student - based on the assumption that the teacher recognizes student's uniqueness and accepts him or her with both strengths and weaknesses;
4. mistake as a part of teaching - the teacher should understand that mistake is a natural part of learning; he or she should not perceive the studnets' mistake as a deficiency, but the possibility for the student to improve and to adapt the current situation in the spirit of the slogan: "we learn from our own mistakes";
5. cooperation - based on the assumption that the educational process is a social phenomenon; this implies that students should be educated in groups of two, three or four; cooperative learning should be part of the lesson and the way how students learn to cooperate and communicate;
6. learning by activity - the student best acquires knowledge or skill when he or she can learn through own activity and experience; therefore, the teacher should only be helpful in teaching of the student.

2.2 Just teacher as an authority

The relationship of the teacher to the student can be described as an evaluation and emotional attitude which the teacher has taken towards the student and which he or she has acquired based on the assessment of the student's personality. This relationship is based primarily on the teacher's assessment of the student's qualities and expressions at school (during the educational process and during the performance of school responsibilities), but also on the assessment of the student's behavior outside the teaching process. The development and course of the relationship between the teacher and the student influence the behavior and activity of the students, but the activity and behavior of the teacher is influenced to the same extent (Ondriová, 2010). These principles, together with many others, create a student's image of the teacher's personality. Students favor a teacher who is fair, reasonably rigorous, demanding, friendly, cheerful and who uses activating teaching methods (Gavora, 2007).

An area that students perceive very sensitively in relation to teacher justice is examining and evaluation. This part of the teaching process directly affects teachers and students and indirectly parents. For many students and parents, the issue of examinations and assessments is the most discussed topic concerning school attendance. The reason is that it affects the most sensitive personal aspect of a person, which is self-confidence. Students achieving good results are generally more confident about themselves than students whose results are not as expected. Examining and subsequent evaluation give the learner a sense of expectation and uncertainty. Although the feelings of examination and evaluation are different for each student, everyone expects them to be fair. There are some principles that a teacher should follow when assessing students (with regard to the student's status and personal development).

These principles are as follows (Krelová, 2005):

- a fair and objective assessment of the student can only be made on the basis of the complex activities and performances that student demonstrates during the lessons;
- the student as a whole must be assessed fairly and without prejudice; the teacher must not just look at student's bad qualities;
- results and statements related to student's assessment should be true, concise, objective and fair.

Students perceive teacher justice in the context of evaluation of their results. Evaluation of results represents the feedback of interaction and informative value of the level of knowledge, skills and readiness acquired by the student. Just as good results are a good mentor's mirror, each teacher should be aware that if his or her students do not achieve the expected results, it is likely that the fault may be on his or her side. Therefore, the teacher should choose a method of assessment that will motivate students and help them to strengthen their self-esteem. In this process, justice is a particularly powerful tool that students can appreciate. However, the teacher must also apply equity as a tool of equality in assessing students in the teaching process (Ondriová, 2010).

As we have already mentioned, the assessment of students has a significant impact on their current feelings. However, few realize that a fair or unfair assessment of a student is also shaped by his or her personality. One of the aims of the education process is to teach the student to learn independently and to prepare student for lifelong learning. However, this goal can only be achieved if the student develops a positive attitude to learning during school. However, if a teacher is unfair and biased towards a student, either in terms of assessing their learning performance or in terms of assessing their activities, it is very likely that the student will develop a negative attitude towards school and learning. This may be of a long-term nature, as a result of which the student will not want to attend school and will not be interested in further education even in adulthood (Dravecký, 2011).

Teacher's authority towards the student is based on an unequal and asymmetric relationship, no matter how friendly the teacher is. If this were not the case, students would perceive the teacher as equal, but not as an authority. The English philosopher Thomas Hobbes has already said that "Power equal to all others is no power." what means, if the students had the same status as the teacher, the appointed person would have no authority. As an authority, the teacher has the power and its tools: social status, charisma, knowledge, information and other means that he or she can use to directly and indirectly influence students' behavior and actions. In applying these means, the teacher must be aware that attaining his or her goals at all costs is not the right way, and that applying violence at the expense of justice can easily disrupt his authority. The teacher has to realize that part of authoritative education is not only the moment of compulsion but also the moment of conviction. If the moment of conviction is missing, we are talking about the domination of a teacher whose students seem to consider techer authoritative, but not just (Buraj, 2015).

In order for a teacher to be able to teach a student, the student must trust him or her as an authority. It means that the student must take the view that the teacher is really trying to provide him or her with new and valuable knowledge during the lesson. The student also needs to feel that the teacher cares about him or her and, above all, he or she has to believe and accept that the teacher's decisions are fair, or at least guided by the pursuit of fair evaluation (Hadušovská, 2000).

As mentioned above, the teacher does not gain authority permanently. Students react very sensitively to his or her behavior, assessment, attitude, mood. John Hattie, working at the University of Melbourne, has collected more than 65,000 research reports addressing the impact of various factors and interventions on student learning. His results showed that the size of the class, uniforms, and separation of students by ability had a negligible impact on the learning outcomes. He revealed that students' achievements and work are influenced to a maximum extent by factors whose set we can call the teaching expertise. This means that a righteous teacher who is an authority for the students, accepting their needs and uniqueness, can teach students the skills corresponding to one and a half years of teaching by an "ordinary" teacher during the school year (Brezovská, 2017).

As already mentioned, authority provides the teacher with the power that he or she legitimately derives from his or her status. However, the teacher must be able to work with his or her power. Otherwise, two situations may arise (Čonková, 2012):
- the teacher starts abusing power and creates a class climate that is characterized by fear;
- the teacher will not exercise his or her power consistently and will not be respected by students.

This implies that the teacher must be fair not only in assessing students but also in conflict resolution when building and maintaining authority. A teacher who is

an authority should build and maintain his or her status without fear on the basis of fair adherence to agreed rules (Letancová, 2002).

Krelová (2005) dealt with the issue of testing and evaluation in her teacher-centered research. The research, which was attended by 30 secondary vocational school teachers, showed that teachers prefer written examination to oral examination. Most teachers consider orientation testing to be the most appropriate form of examinations which, in contrast to ongoing or thematic examination, forces students to prepare for lessons systematically and regularly. Almost 3/4 of the teachers agreed that the teacher should not have a student "boxed" thus not create a certain student's ideal. Most teachers also expressed the opinion that the most optimal form of students' assessment is grading by verbal assessment. Research has shown that objective testing is only possible in an environment conducive to effective evaluation. Teachers should be familiar with the methods and forms of examination and assessment in addition to the methods of examining and evaluating the students. This will allow students to perceive the examination and evaluation of their knowledge objectively and fairly. Since the teacher acts as an authority and the students accept him or her as an authority, this does not mean that they also perceive him as a righteous authority.

Čonková (2012), in order to clarify the pedagogical causes of students' fear, conducted a survey that showed that more than 1400 students who attended the study were afraid of a teacher who judges them unfairly. The partial results of the research showed that it is moodiness, haughtiness and injustice that students consider as the main reasons for the source of fear.

In further research 100 secondary school students have participated. Research has shown that 75% of students think that a good teacher should be fair in the first place. Almost 1/3 of students regard their teacher as precise because he or she is fair and equally 1/3 of research students said that teachers who evaluate their learning outcomes are fair in most cases (Bělohoubková, 2011).

Cseriová's (2013) research also produced interesting results. 100 pupils from five elementary schools and grammar schools from Brno and seven elementary schools from small villages participated in the research. Research has shown that the vast majority of pupils think that the ideal teacher should above all be able to teach and be fair. 96 pupils out of 100 agreed on this.

3 Methods

3.1 Objectives
The aim of the presented research was to verify the relationship between the perceived justice of the teacher and the perceived authority of the teacher in the general and specific context from the perspective of vocational and grammar school students.

3.2 Sample

159 students from Slovak secondary schools of triple character - secondary vocational schools with a technical focus and with a focus on services and grammar schools participated in the research. The sample consisted of 120 men (75.5%) and 39 women (24.5%). The respondents were aged 15-19 with an average age of 17.2 years. 79 students (49.7%) attended secondary vocational school with technical focus, 50 students vocational school with focus on services (31.4%) and 30 students (18.9%) grammar schools. Convenience and purposive sampling method has been used.

3.3 Measures

Research data were obtained using the following methods:
- demographic issues - age, gender, type of school, year.
- Teacher Justice Scale (Dalbert & Maes, 2002) - 10 - item scale aimed to determine the level of perceived justice of teachers (e.g. "In general, teachers treat me fairly."). The task of the respondents was to express the level of their agreement or disagreement on a 6-point Likert scale (1 = strongly disagree; 6 = strongly agree). Since 7 items are reverse coded, they must be reversed before calculating the score.
- Measurement for Omnisicient Authority Beliefs (Zhou, 2007) - 15 questionnaire, in which the task of respondents to express the level of their agreement or disagreement with statements concerning the perception of the authority of teachers at the particular school (items 1-8, e.g. "At the school I attend most of the time listening to teachers.") and statements concerning the general perception of authorities in the school environment (items 9-15, e.g. "I rely on the expertise of teachers rather than my own judgment.") on the submitted 6-point Likert scale (1=strongly disagree; 6=strongly agree). Since 3 items are reverse coded, they need to be reversed before calculating the score.

A set of questionnaires was distributed to the respondents in the form of pencil-paper in the period from December 2018 to March 2019.

4 Results

The primary aim of the research was to verify the existence and determine the nature of the relationship between the perceived justice of the teacher and the perceived authority of the teacher. The results in the table (Table 1) indicate the existence of a positive and significant relationship between perceived justice and perceived authority of the teacher. The same result was also seen when we looked at the perceived authority of the teacher by students from a general point of view (to what extent students generally perceive teachers as authorities) while also focusing on the perceived authority of teachers at the particular school. Thus, the results have shown that the more are the teachers perceived as being fair, the more likely they are perceived as an authority.

Table 1

Pearson correlation

	M	SD	TJS	MOAB	MOAB-G	MOAB-I
TJS	42.95	7.63	1			
MOAB	65.72	9.31	0.281^{**}	1		
MOAB-G	30.72	9.31	0.183^{*}	0.823^{**}	1	
MOAB-I	34.97	5.42	0.273^{**}	0.770^{**}	0.282^{**}	1

**correlation significant at the level p<0,01; * correlation significant at the level p<0,05; M=mean; SD=standard deviation; TJS=Teacher Justice Scale; MOAB= Measurement for Omnisicient Authority Beliefs; MOAB-G=Measurement for Omnisicient Authority Beliefs - general; MOAB-I=Measurement for Omnisicient Authority Beliefs – individual

The analysis also included testing of gender differences in all examined variables (Table 2). Although the difference in means, at least at perceived teacher justice, suggests that female students perceive teachers more as fair, the results of an analysis of gender differences suggest that there are no significant differences in perceived justice and perceived authority of the teacher between males and females.

Table 2

T-tests - gender differences

		N	M	SD	t	p
TJS	male	120	42.49	7.34	-1.330	0.185
	female	39	44.36	8.42		
VAU	male	120	65.71	9.73	-0.017	0.986
	female	39	65.74	8.03		
VAUFV	male	120	30.84	6.39	0.333	0.740
	female	39	30.46	5.52		
VAUFK	male	120	34.87	5.52	-0.407	0.685
	female	39	35.28	5.17		

N=number of participants; M=mean; SD=standard deviation; * p<0,05; TJS=Teacher Justice Scale; MOAB= Measurement for Omnisicient Authority Beliefs; MOAB-G= Measurement for Omnisicient Authority Beliefs - general; MOAB-I= Measurement for Omnisicient Authority Beliefs - individual

Since respondents attended secondary schools with three different focuses - technical, services and grammar - we have also tested the data from this perspective. The aim was to test the potential differences in perceived justice and perceived authority of teachers in relation to the type of school respondents attend. The results of the analysis of variance (Table 3) indicate the existence of

differences between the three groups of respondents only in the case of generally perceived authority of teachers.

Table 3

ANOVA - differences according to school focus

		<u>N</u>	<u>M</u>	<u>SD</u>	<u>F</u>	<u>p</u>
	T	79	42.86	0.79		
TJS	S	50	43.58	1.34	0.344	0.709
	G	30	42.10	10.7		
	T	79	65.94	1.08		
VAU	S	50	63.62	1.04	2.904	0.058
	G	30	68.76	2.03		
	T	79	31.15	0.68		
VAUFV	S	50	27.86	0.68	12.834	$\leq 0.001^*$
	G	30	34.62	1.19		
	T	79	34.78	0.53		
VAUFK	S	50	35.76	0.79	0.917	0.402
	G	30	34.14	1.26		

T=technical; S=services; G=general; N=number of participants; M=mean; SD=standard deviation; * p<0,05; TJS=Teacher Justice Scale; MOAB= Measurement for Omnisicient Authority Beliefs; MOAB-G= Measurement for Omnisicient Authority Beliefs - general; MOAB-I= Measurement for Omnisicient Authority Beliefs - individual

In order to obtain more detailed results, the data were subsequently examined by Bonferroni post hoc testing, which proved the existence of statistically significant differences in the generally perceived authority of teachers between students with technical and service focus (p=0.006); between technical and grammar school students (p=0.022) and finally between grammar school and service school students (≤0.001). Looking at the means in this variable, it is clear that in general, teachers are the least perceived as authority by students from secondary vocational schools with a focus on services, followed by secondary vocational schools with technical specialization and teachers as authorities perceive the most students from grammar schools.

5   Discussion and conclusion

The main aim of the paper was to identify the nature of the relationship between the perceived justice of the teacher and the perceived authority of the teacher on a sample of Slovak vocational secondary school students with a triple focus - technical, services and grammar. In formulating this goal, we started from several home researches conducted so far, which pointed out the difference in respecting of teachers' authority among secondary vocational school and grammar school students, whereas in the Czech Republic and Slovakia this was

not a problem for grammar school students (Zemaníčková, 2014), what the results of our study support.

The results of our research indicate that the relationship between perceived justice and perceived authority of the teacher is significant, which corresponds to the results of Bělohoubková (2011), who states that almost 1/3 of the students questioned consider their teacher precisely because he or she is fair. Up to 96% of students think that an ideal teacher should above all be able to teach and explain the curriculum and be fair (Cseriová, 2013). Students also consider as a favourite teacher the one who is just, reasonably strict and demanding, friendly, cheerful and who uses activating teaching methods (Gavora, 2007). The teacher perceived by students in this way then has an enormous advantage on his or her side, as the above mentioned facts support students' motivation to learn, which is essential for the smooth running of the teaching process. The real experience of teachers suggests that the lack of motivation in the academic environment is becoming a serious problem (Rovenská, 2017).

It follows from the above that building the authority of the teacher is primarily in his or her hands. One, but of course not the only condition that supports authority building is a fair approach to which students, as it turns out, are particularly sensitive. Accessing students fairly is not an easy task for any teacher, since perception of oneself as righteous may differ greatly from the perception of this apparent righteousness by individual students, who naturally dispose interindividual differences. It should not be forgotten that the perception of the teacher as just and fair supports the building of natural authority in particular. However, the fact that a teacher acts as an authority and that students accept it as an authority does not mean that they also perceive him as a just authority (Krelová, 2005). It is therefore extremely important for teachers to pay attention to these facts not only at secondary schools but at all levels of the educational system, which is one of the basic pillars of public administration. One of the ways how to help teachers in mentioned issues is to provide them with social-psychological training as a part of lifelong learning (Geršicová & Barnová, 2018).

References

Barboráková, V. (2012). *Tvorba autority učiteľa na 1. stupni základnej školy.* České Budejovice: Jihočeská univerzita.

Beck, G. (2007). *Zakázaná rétorika: 30 manipulativních techník.* Praha: Grada.

Bělohoubková, A. (2011). *Sociálny a charakterový profil učiteľa stredných odborných škôl.* Bratislava: Slovenská technická univerzita.

Brezovská, L. (2017). *Musí sa človek ako dobrý učiteľ narodiť?* Bratislava: eduworld.sk. Retrieved from https://eduworld.sk/cd/michal-ondrus/4995/slovenske-skolyzacali-vyuzivat-elektronicku-evidenciu-dochadzky

Buraj, I. (2010). Moc v štruktúre mocenských vzťahov. *Filozofia, 65*(5), 417-427.

Cseriová, K. (2013). *Komparácia pohľadov na problematiku ideálneho učiteľa podľa žiakov základných škôl a ich rodičov*. Brno: Masarykova univerzita.

Čonková, A. (2015). Osobnosť učiteľa a jeho výchovné pôsobenie ako zdroj strachu žiakov v škole. *Paidagogos*, *1*, 17-29.

Dalbert, C., & Maes, J. (2002). Belief in a just world as personal resource in school. In M. Ross, D. T. Miller (Eds.), *The Justice Motive in Everyday Life* (pp. 365-381). New York: Cambridge University Press.

Dravecký, J. (2011). *Hodnotenie a klasifikácia žiakov*. Levoča: Virtuálny kabinet. Retrieved from http://www.jan.dravecky.org/data/hodnotenie_klasifikacia_ziakov.pdf

Dunn, P. (2011). *Chaos magie*. Praha: Grada.

Dworkin M. R. (2001). *Keď sa právo berie vážne*. Bratislava: Kaligram.

Gavora, P. (2007). *Teacher and Pupils in Communication*. Bratislava: Comenius University in Bratislava.

Geršicová, Z., & Barnová, S. (2018). Personal and social training as a part of class teachers' lifelong learning. *Acta Educationis Generalis, 8*(2), 24-39. https://doi.org/10.2478/atd-2018-0009

Hadušovská, S. (2000). Theory of justice in the context of current discussion. *Individual and Society, 3*(2), 7-15.

Kábrt, J. (2000). *Latinsko-český slovník*. Praha: Leda.

Kitchen, H. W. (2014). *Authority and the Teacher*. London: Bloomsbury Publishing.

Koníčková, J. (2017). *Chcete si vybudovať v triede autoritu? Pomôcť vám môžu tieto tipy*. Bratislava: eduworld.sk. Retrieved from https://eduworld.sk/cd/jaroslava-konickova/4656/autorita-ucitela-ako-ju-ziskat

Kosová, B. (2014). *Autorita a moc vo výchove*. Banská Bystrica: Univerzita Mateja Bela.

Krelová, K. (2005). *Pohľad učiteľov na skúšanie a hodnotenie žiakov*. Bratislava: Slovenská technická univerzita. Retrieved from https://www.mtf.stuba.sk/buxus/docs/internetovy_casopis/2005/3/krelova.pdf

Letancová, E. (2002). *Psychológia v manažmente*. Bratislava: Centrum ďalšieho vzdelávania Univerzity Komenského v Bratislave.

Ondriová, D. (2010). *Interakcia učiteľa a študenta ako jedno z kritérií efektívnej realizácie didaktického procesu*. Prešov: Prešovská univerzita. Retrieved from https://www.pulib.sk/web/kniznica/elpub/dokument/dupkalova1/subor/ondriova.pdf

Rawls, J. (1999). *A Theory of Justice Revised Edition*. Massachusetts: Havard University Press Cambridge.

Rötling, G. (2004). *Pedagogické riadenie školy*: Banská Bystrica: Metodicko-pedagogické centrum.

Rovenská, D. (2017). Vybrané aspekty rozvoja motivácie u študentov. *Verejná správa a spoločnosť, 18*(1), 95-104.

Turek, I., & Albert, S. (2005). *Kvalita školy*. Bratislava: Slovenská technická univerzita.

Ušálová, T. (2011). *Sociálne vzťahy a problémy na školách: praktická príručka pri riešení náročných pedagogických situácií na 2. stupni ZŠ a SŠ.* Bratislava: Raabe.

Vališová, A. (2008). *Jak získat, udržet a neztrácet autoritu*. Praha: Grada.

Vašašová, Z. (2017). Autorita učiteľa ako faktor vzťahu medzi učiteľom a žiakom. *Školský psychológ/ Školní psycholog, 18*(1), 55-60.

Večeřa, M. et al. (2011). *Teória práva*. Bratislava: Eurokodex.

Zemančíková, V. (2014). Problémové správanie žiakov a úloha sociálneho pedagóga v reflexii učiteľa. *Sociálni pedagogika, 2*(1), 22-36.

Zimová, Z., (2013). *Vzťah učiteľa a žiaka v školskom prostredí.* Bratislava: Výskumný ústav detskej psychológie a patopsychológie. Retrieved from https://www.komposyt.sk/pre-odbornikov/ziak-so-svvp/preview-file/ucitel-a-ziak-vnutro-4-944.pdf

Zhou, F. (2007). *Perceived Teacher-Directedness, Omniscient Authority, and Communication Behaviors in Second Language Cooperative Learning* (dissertation thesis). Florida: Florida State University.

Conceptions of Class Teachers on Democracy and Diversity

*Lütfi Üredi**

Abstract:
Introduction: Globalization provided people in once isolated lands with an array of democracy types and international principles. The boosting traditional, conventional, societal, ethnical, and cultural differences in countries all over the world are pushing educational authorities to reexamine their contemporary habits, customs, principles, and practices of citizenship. Examining the assumptions and methods of cultural democracy in education settings is the foundation of critical pedagogy. Thus, a critical multicultural pedagogy is formed on critical views on democracy and diversity by illuminating the transformative nature of citizenship. Accordingly, this study inquires the conceptual grounds of class teachers in a phenomenological tradition in that it investigates the conceptions of these teachers on the concept of diversity and democracy. The data of the study were gathered through a questionnaire, besides semi-structured interview questions designed by the researcher. Based on a mix method research design, this study makes use of both qualitative and quantitative techniques to collect the required data. 160 class teachers officially working in diverse regions in Turkey voluntarily participated in the study (N=150 for the questionnaire and N=10 for the interview). Related implications to raise the awareness of class teachers on diversity and democracy were presented at the end of the study.
Methods: This study searched for the conceptual underpinnings of the class teachers in the phenomenological tradition (Marton, 1981). Just like other methods to utilize philosophical phenomenology to the social sciences (Entwistle, 1997), the interpretative process of phenomenographic research is quite similar to that of grounded theory which refers to a set of systematic inductive methods to practice qualitative research (Richardson, 1999). Based on a mix method research design, this study makes use of both qualitative and quantitative techniques to collect data.
Results: The findings demonstrate that class teachers are open to new perspectives, diverse religions and different genders. Thus, it can be said that a critical perspective was adopted by class teachers. Further, class teachers should be included into curriculum and syllabus design which are solely carried out by policy makers. Otherwise, critical skills of class

---
* Lütfi Üredi, Mersin University, Mersin, Turkey; lutfiuredi33@gmail.com

teachers might be destroyed in the process of education. Thus, primary school curriculums and textbooks need to focus on the importance of democracy and diversity. Policy makers, Ministry of National Education, Turkey and Higher Council of Education need to include critical theory and critical pedagogy into curriculum. Future studies should focus on the views of both novice and professional class teachers. In addition, views regarding democracy and diversity from different cultures need to be examined in future research. Direct democracy, representative democracy, gender diversity, cultural diversity and pluralistic perspectives need to be adopted by related textbook publishers, classroom teaching departments, administrators and policy makers.

Discussion: The findings of the study show that the participants developed a positive perspective towards democracy and diversity, although some issues in the context of Turkey are hardly mentioned or criticized (Dodd, 1992). The most important problem in examining democracy and diversity was religion because the participants stated that they respect religion, in their case Islam, because they somewhat would not want to hear church bell in a land of Islam (Bader, 2007). Diversity has been conceptualized as a positive element in the study. Since democracy and diversity are interrelated and interwoven, the participants generally adopted these terms (Banks et al., 2005).

Conclusion: The results of the study suggest that the respondents had positive conceptions on individual and cultural diversities. Further, they developed good attitudes towards cultural democracy and they believe in the power of integration through individual differences. Critical pedagogy is an educational theory which aims to form a progressive and democratic culture by means of critical inquiry, which consequently results in valuing and respecting personal and cultural differences. Critical pedagogy perceives teaching as a naturally political event, refuses the neutrality of knowledge, and asserts that matters of social justice and democracy are not recognizable from only educational activities.

Key words: democracy, diversity, cultural democracy, critical pedagogy, class teachers.

Introduction

An expanding diversity and a trend in an appreciation of democracy are contemporarily observed all over the world. Piles of people emigrated from previous colonies situated in Africa, Asia, and the West Indies to the UK to empower its economy only after the 2nd World War (Banks et al., 2005). Every person is different and this may sometimes result in complications in case of their cultures, traditions, lifestyles, and habits not being appreciated by others. Yet, welcoming differences is pivotal in order to keep the required harmony in our social ties (Kottak, 2015). Embracing diversities instead of discarding them and considering them important develop human beings by means of widening

their visions (García, 1994). Being aware of different lifestyles, customs, habits, traditions, and cultures or any feature of diverse and local societies which are unique may simply empower the comprehension of diversity as insight or intelligence fosters points of view (Ogbu, 1992). It is crystal clear that displaying respect or appreciation for individual differences does not totally mean welcoming everything even if not agreed on. It is a shame that we construct barriers before diverse voices in order to keep ourselves isolated (Barkema, Bell, & Pennings, 1996). This state, as a result, gives way to doubts for others with respect to their beliefs, nationalities, origins, gender, and other characteristics (Belot & Ederveen, 2012). The world, as an international society, highly accepts the array of multi-cultures more than ever before (Bull, 1984). Respectively, schools expose the students to a range of conceptions as democracy, direct democracy, cultural democracy, justice, freedom, diversity, cultural diversity, and other associated concepts (Meier, 2003). MacNaughton and Hughes (2007) put forward that class teachers in Victoria, Australia confront increasing ethnic, religious, and cultural diversity among students and families around. Almost all the teachers in Victoria were not sure about how to react to the mentioned state in which an asymmetry between the societal expectancies that teachers would trigger students to value individual differences and their own classroom practices are observed. In order to understand cultural diversities and multicultural instruction more, teachers ought to start showing respect towards their students along with their backgrounds (Midobuche, 1999). Moreover, American education system bears a cultural diversity which is in the middle of a hectic transformation. In the US, the state of diversity necessitates schools to find out and pinpoint to the needs of a lusty population (Uehara, 2005). The expanding diversity in school settings has lately necessitated additional demands from instructors seeking to facilitate and foster the academic achievement of every student (Humphrey et al., 2006). Therefore, how diversity and cultural democracy are conceived in classrooms and what class teachers should do to raise the awareness of students on democracy are the key points in this study. Consequently, it is pivotal to develop critical pedagogy in Turkey.

1 Literature review

Democracy refers to ruling by the people in that the original word demos means people, while kratos originally means ruling or directing. Decision making is practiced directly by people in a direct democracy. In the city based federations of old Greece, it was easy to construct a sort of direct democracy since the number of people living in these city states was around 10000 and females and slaves were not respected as citizens (Banks et al., 2005). Democracy means a practice of living together (Dewey, 1961). By looking at past and even today, it can be easily said that democracy is a delicate system as most democracies could not survive. People cannot innately acquire such complicated concepts as fair justice, the split of government and church, the requirement of a limit on

majority power, or benevolence for disfavored behaviors and beliefs. Such terms are cognitively attained, and they are acquired with difficulty. Accordingly, we should value the impressive challenge of creating democrats (Mitchell, 1953; Banks et al., 2005). Further, cultural democracy is a crucial expansion of the term political democracy (Banks et al., 2005). Diversity defines the extensive scope of cultural, ethnic, religious, and linguistic varieties that occur within and across people who live in multicultural settings. During the history of mankind, human beings lived in small groups or tribes where a smaller extent of differences mostly including social status and gender were encountered. Extensive varieties in the languages, cultures, beliefs, and religions within human communities hastily enhanced by means of colonization, trade, and exploration practices of big empires. People from diverse lands were agglomerated when empires colonized and ruled weaker nations. Within these colonized lands, a mixture of hybrid cultures was developed (Banks et al., 2005). This study aims to elicit the views of the class teachers on democracy and diversity through two data collections tools. The study is important because emancipatory education is seldom applied in Turkish schools as the centralized system hardly allows teachers to make changes regarding curriculum and syllabus because teachers generally have to follow a strict syllabus that is directly given to them by the Ministry of education in Turkey.

2 Methodology

The aim of this study is to understand class teachers' conceptions on personal differences and cultural democracy and develop implications to raise awareness of the related concepts in classrooms. To inquire the issue, the current paper employed phenomenography (Booth, 1997) that is a qualitative research methodology, within the interpretivist paradigm (Thanh & Thanh, 2015), which probes the qualitatively diverse ways in which respondents have experience of something or understand something (Svensson, 1997). That's to say, this study searched for the conceptual underpinnings of the class teachers in the phenomenological tradition (Marton, 1981). Just like other methods to utilize philosophical phenomenology to the social sciences (Entwistle, 1997), the interpretative process of phenomenographic research is quite similar to that of grounded theory which refers to a set of systematic inductive methods to practice qualitative research (Richardson, 1999). Based on a mix method research design, this study makes use of both quantitative and qualitative techniques to collect data. A questionnaire designed by Öksüz and Güven (2012) was utilized for the quantitative strand of the study. Further, a semi-structured interview designed by the researcher was applied for the qualitative strand of the study.

3   Participants

160 class teachers (N=62 male and N=98 female) working at diverse districts in Turkey voluntarily participated in the study (N=150 for the questionnaire and N=10 for the interview). Convenience sampling method, which is a type of sampling where the very first possible data source is used for the research without additional requirements, was utilized in the study (Acharya, Prakash, Saxena, & Nigam, 2013).

4   Procedure

The participants were given information about the nature of the study. Warm-up activities concerning democracy and diversity were performed. The participants asked questions about the content of democracy and diversity. In addition, the participants negotiated these issues to be familiarized with the present study. After the data were collected, the participants were asked whether the themes identified by the researcher were appropriate for them. In the next stage, the researcher studied the themes with two experts in the field of education. Lastly, the data were analyzed and interpreted.

5   Findings and results

The following parts include the levels of agreement on diversity and democracy. In a similar vein, the pursuing parts illuminate the extent of approval of diversity and democracy.

5.1   Class teachers' totally agreed aspects on diversity

Table 1

Totally agreed aspects

Item	$\bar{x}$
20. I believe that tastes are personally identifiable.	4.60

As it can be clearly understood from Table 1, only one item was observed within this category. A big number of informants ($\bar{x}$=4.60) totally agree on the mentioned item.

5.2 Class teachers' mostly agreed aspects on diversity

Table 2

Mostly agreed aspects

Item	$\bar{x}$
9. I do not find different practices in religious life odd.	4.37
30. Cultural differences are like Ashure (Turkish: Aşure); each ingredient of it forms a special taste without losing its self characteristics.	4.26
3. I do not consider the gender important when selecting my kid's teacher.	4.24
2. While developing relationships with my friends, I do not consider their level of income.	4.08
23. I do not find someone odd even if they are afraid of something that I find enjoyable.	4.01
16. I do not perceive cultural differences as something which make individuals superior to each other.	3.84
19. I believe that it is not true to hinder the ritual of burning the dead rather than burying it, even if I find this practice illogical.	3.80

Table 2 simply represents the items on which the informants mostly agree. In other words, the items displayed in Table 2 are mostly agreed by the respondents with the following mean scores: the 9th item ($\bar{x}$=4.37); the 30th item ($\bar{x}$=4.26); the 3rd item ($\bar{x}$=4.24); the 2nd item ($\bar{x}$=4.08); the 23rd item ($\bar{x}$=4.01); the 16th item ($\bar{x}$=3.84); and the 19th item ($\bar{x}$=3.80).

5.3 Class teachers' moderately agreed aspects on diversity

Table 3

Moderately agreed aspects

Item	$\bar{x}$
10. Rather than what is thought, who thinks deserves respect.	2.99
1. I think it is normal for people to abstain from what is different.	2.60

Table 3 clearly shows the items on which the informants moderately agree. More specifically, the 10th ($\bar{x}$=2.99) and the 1st ($\bar{x}$=2.60) items shown in Table 3 are moderately agreed by the participants.

5.4 Class teachers' somewhat agreed aspects on diversity

Table 4

Somewhat agreed aspects

Item	$\overline{x}$
15. If someone defends a view which I find silly, I never take it seriously.	2.40
29. I find those who do not dress convenient with their ages irritating.	2.27
12. University education is a must to succeed in social relationships.	2.16
18. The vote of those whose education level is high should be more valuable.	2.10
4. I never become friends with those who are homosexuals.	2.10
26. Being a powerful country is realized by not allowing diversities.	1.94
17. Even if I find it true, I do not accept a view which is opposed to the majority of people.	1.93
25. There is no drawback in mocking with a person who behaves extraordinary.	1.82
6. Youngsters should keep quiet while adults should speak.	1.80
14. I see those who are busy with meaningless issues as ignorant.	1.75
11. Having economically prosperous friends makes me feel better.	1.63
13. I feel disturbed by those who walk around in traditional clothes.	1.60
24. Hearing church bell in a Muslim land makes me feel disturbed.	1.60
21. If I had the possibility to do so, I would omit some colors from rainbow.	1.56

Table 4 apparently demonstrates the items on which the informants somewhat agree. In a similar vein, the 15th item ($\overline{x}$=2.40), the 29th item ($\overline{x}$=2.27), the 12th item ($\overline{x}$=2.16), the 18th item ($\overline{x}$=2.10), the 4th item ($\overline{x}$=2.10), the 26th item ($\overline{x}$=1.94), the 17th item ($\overline{x}$=1.93), the 25th item ($\overline{x}$=1.82), the 6th item ($\overline{x}$=1.80), the 14th item ($\overline{x}$=1.75), the 11th item ($\overline{x}$=1.63), the 13th item ($\overline{x}$=1.60), the 24th item ($\overline{x}$=1.60), and the 21st item ($\overline{x}$=1.56) are somewhat agreed by the participants.

5.5 Class teachers' somewhat agreed aspects on diversity

Table 5

Totally disagreed aspects

Item	$\overline{x}$
8. I am not in need of talking to those whose education level is lower than me.	1.48
22. I believe that a male's crying means weakness.	1.47
28. I do not want to get married with someone from another race.	1.44
7. The bossy behaviors of a male are tolerable, but when a female represents such behaviors, it is not tolerable.	1.42
5. I do not accompany with someone physically handicapped.	1.24
27. Males cannot be as successful as females in teaching profession.	1.22

Table 5 plainly exhibits the items on which the informants totally disagree. More specifically, the 8th item ($\overline{x}$=1.48), the 22nd item ($\overline{x}$=1.47), the 28th item ($\overline{x}$=1.44), the 7th item ($\overline{x}$=1.42), the 5th item ($\overline{x}$=1.24), and the 27th item ($\overline{x}$=1.22) are totally disagreed by the informants.

5.6 Interview results on democracy and diversity

Table 6 illustrates the responses of the informants on individual differences, attitudes towards differences, democracy, and individual differences in democracy. Further, as it is clearly understood from the table, remarks of students are given for each theme.

Table 6

Democracy and diversity

Theme	Type	#	Remarks of Informants
	personality	5	"Both physical and psychological differences are the first coming concepts coming into my mind. State of being disabled is a kind of difference just like being short or tall, or overweight or thin. Further, each individual differs from each other in their viewpoints, lifestyle, culture and traditions."
	physical state	5	
	viewpoint	5	
1. Individual Differences	beliefs	4	
	culture	3	
	lifestyle	3	
	social status	2	
	experiences	1	
	race	1	
2. Attitudes towards individual	open- minded	10	"I am open to any individual difference on religion, language,

	differences			political view, gender, and sexual preferences."
3.	Democracy	freedom	7	"Democracy is a platform in which everyone freely expresses their opinions. In short, democracy means freedom."
		equality	6	
		respect	3	
		lifestyle	2	
4.	Individual Differences in Democracy	beneficial for democracy	9	"Individual differences are beneficial for democracy. If everyone would be the same in a society, there would be only one truth. However, in a society with diversities, there would be diverse truths which compose a healthy democracy."
		no need	1	

One can simply understand from Table 6 that personality, physical state, and viewpoint were the most emerged themes with a dispersion of 5 within the category of individual differences. Further, the pursuing themes successively followed the mentioned themes: beliefs (f=4); culture (f=3); lifestyle (f=3); social status (f=2); experiences (f=1); and race (f=1). By looking at attitudes towards individual differences, it is clearly observed from the table that all the informants (f=10) were open to individual differences (religion, language, political views, gender, and sexual preferences). Besides, Table 6 plainly displays the themes given for the definition of democracy. Within this category, freedom (f=7) was the most occurred theme which was followed by such concepts as equality (f=6), respect (f=3), and lifestyle (f=2). Lastly, regarding the individual differences in democracy, almost all informants (f=9) stated that they are beneficial for democracy, while only 1 respondents declared an opposite point of view.

6 Discussion

This study aimed to examine the views of class teachers on democracy and diversity. The findings of the study show that the participants developed a positive perspective towards democracy and diversity, although some issues in the context of Turkey are hardly mentioned or criticized (Dodd, 1992). The most important problem in examining democracy and diversity was religion because the participants stated that they respect religion, in their case Islam, because they somewhat would not want to hear church bell in a land of Islam (Bader, 2007). Diversity has been conceptualized as a positive element in the study. Since democracy and diversity are interrelated and interwoven, the participants generally adopted these terms (Banks et al., 2005). The participants also developed a positive view towards gender diversity (Colgan & Ledwith, 2002; Ordem & Ulum, 2020) and learner diversity (Adams & Nicolson, 2011). It can be interpreted that class teachers in this study support the topic of diversity

within the framework of democracy. There are a great number of studies that show that democracy and diversity are generally adopted by learners because it seems that learners are more open to diversity (Na & Kim, 2003; Sadeghi, 2008; Chinh, 2013; Ooiwa-Yoshizawa, 2018). However, teachers and administrators are generally affected by curriculum and textbooks (Wen-Cheng, Chien-Hung, & Chung-Chieh, 2011). Another problem is that learners are not involved in preparation of curriculum, syllabus and textbooks (Cunningsworth, 1995; Wen-Cheng, Chien-Hung, & Chung-Chieh, 2011). They are generally excluded from learning systems. Even pre-service teachers are discarded because participatory approach is not adopted in their settings (Lee, 2014). Therefore, teachers and learners seem to be alienated from this discipline because their inclusion that respects democracy and diversity is ignored and neglected. The findings of this study clearly indicate that democracy and diversity are appreciated by class teachers. Critical pedagogy and critical theory have been developed to endorse democracy and diversity (Carr, 2011). However, these ideas were hardly adopted in classroom teaching field. Class teachers' being open to diversity should be reinforced in their departments (Crookes, 2013). Gender diversity and cultural diversity need to be emphasized in learning settings so that learners can be emancipated from fixed ideologies and essentialist ideas, and conservative ideas may hinder learners from developing critical thinking skills (King & Kitchener, 1994). Unless learners are involved in these processes, participatory approach cannot be implemented. The main principles of participatory approach are to develop critical thinking skills including attitudes towards democracy and diversity and liberate learners and teachers from fixed ideologies (Ördem & Ulum, 2019). Modernization in Turkey has reinforced democracy and diversity, even if certain problems are still experienced today (Ördem, 2018a). Individual identity has seldom emerged in Turkish modernization (Ördem, 2018b). Thus, sociological background of democracy in the process of Turkish modernization also plays an important role (Ördem, 2018a). Democracy in Turkey is closely related to modernization. Without modernization practices and focus on individual identity, diversity is hard to reinforce (Ördem, 2018b). This study also showed that individual differences are pivotal in education. The participants believed in the importance of democracy, diversity, individual identity and individual differences. However, the schools where they worked were more conservative about the application of democracy because the macro structure of the ministry of national education hardly allowed the participants to implement democracy and diversity in the classroom settings since they hardly managed to change the curriculum or syllabus. Thus, they could not encounter a democratic approach in the school environment. The main problem is that centralization of education in Turkey still remains an important problem. Although Turkey has been modernized since the 19th century, individual differences, direct democracy and diversity are hindered. Thus, political decisions by the centralized system in Turkey tend to impede the development of democracy and

diversity in Turkish schools which are dependent on the ministry of education. However, the participants developed a positive attitude towards diversity and individual differences. Thus, the problem lies in the implementation of the ministry of education because the participants are not involved in the process directly. Although Aydin and Koc-Damgaci (2017) mention plurality and diversity in Turkish education, we believe that plurality and diversity are seldom implemented at individual level because teachers as individuals lack the power and freedom to change curriculum and syllabus because the education system in Turkey is composed of strict regulations that teachers have to follow. Özen (2015) showed that the teachers developed a positive attitude towards democracy, multicultural education and diversity. Similarly, Akinlar and Dogan (2017) mention the importance of multicultural education so as to reinforce diversity in education in Turkey. These studies take teachers' views on democracy, multicultural education and diversity which are perceived as positive by the participants. However, what is often ignored in these is that the centralized system in Turkey hardly involves individuals in the system. Thus, there is a reverse relationship between the teachers' perspectives and the centralized institutes in Turkey. If teachers can be involved in the process of education actively and dynamically, then changes can be expected because teachers lack the free will to make the necessary changes regarding curriculum and syllabus. Therefore, there should be space for teachers to implement direct democracy and participatory approach in school settings.

Conclusion
This study intended to unearth the views of class teachers on diversity and democracy. The majority of the informants have a positive view towards these two elements. The findings demonstrate that class teachers are open to new perspectives, diverse religions and different genders. Thus, it can be said that a critical perspective was adopted by class teachers. However, critical theory and critical pedagogy were not presented to these teachers in their departments. Therefore, these class teachers should have a word in designing curriculum and syllabus. Otherwise, critical skills of class teachers might be destroyed in the process of education. Thus, primary school curriculums and textbooks need to focus on the importance of democracy and diversity. Policy makers, Ministry of National Education, Turkey and Higher Council of Education need to include critical theory and critical pedagogy into curriculum. Future studies should focus on the views of both novice and professional class teachers (see e.g. Geršicová & Barnová, 2018). In addition, views regarding democracy and diversity from different cultures need to be examined in future research. Direct democracy, representative democracy, gender diversity, cultural diversity and pluralistic perspectives need to be adopted by related textbook publishers, classroom teaching departments, administrators and policy makers. In brief, the pursuing results were obtained as a result of the study: a) the respondents had positive

conceptions on individual and cultural diversities; b) they developed good attitudes towards cultural democracy; and c) they believe in the power of integration through individual differences. Critical pedagogy is an educational theory which intents to form a progressive and democratic culture by means of critical inquiry, which consequently results in valuing and respecting personal and cultural differences. Critical pedagogy perceives teaching as a naturally political event, refuses the neutrality of knowledge, and asserts that matters of social justice and democracy are not recognizable from only educational activities. Thus, this study puts forward precious advice for classrooms in developing ways to enhance the critical thinking skills of both teachers and students.

References

Acharya, A. S., Prakash, A., Saxena, P., & Nigam, A. (2013). Sampling: Why and how of it. *Indian Journal of Medical Specialties*, *4*(2), 330-333.

Adams, H., & Nicolson, M. (2011). Learner diversity. In M. Nicolson, L. Murphy, & M. Southgate (Eds.), *Language Teaching in Blended Contexts.* Edinburgh: Dunedin Academic Press.

Akinlar, A., & Dogan, S. (2017). Investigating multicultural education phenomena in minority and public high schools in Turkey: A multiple case study. *Eurasian Journal of Educational Research*, *17*(71), 1-20.

Aydin, H., & Koc-Damgaci, F. (2017). From empire to republic: Citizenship, pluralism, and diversity in Turkey. In *J.* A. Banks (Ed.), *Global Migration, Structural Inclusion, and Education across Nations* (pp. 351-377).

Bader, V. M. (2007). *Secularism or democracy Associational governance of religious diversity*. Amsterdam: Amsterdam University Press.

Banks, J. A., Banks, C. A., Cortés, C. E., Hahn, C. L., Merryfield, M. M., Moodley, K. A., & Parker, W. C. (2005). *Democracy and Diversity. Principles and Concepts for Educating Citizens in a Global World.* Retrieved from https://education.uw.edu/sites/default/files/cme/docs/pdf/_notes/DEMOCRACY%20AND%20DIVERSITY%20pdf.pdf

Barkema, H. G., Bell, J. H., & Pennings, J. M. (1996). Foreign entry, cultural barriers, and learning. *Strategic Management Journal*, *17*(2), 151-166.

Belot, M., & Ederveen, S. (2012). Cultural barriers in migration between OECD countries. *Journal of Population Economics*, *25*(3), 1077-1105.

Booth, S. (1997). On phenomenography, learning and teaching. *Higher Education Research & Development, 16*(2), 135-158.

Bull, H. (1984). *The Expansion of International Society*. Oxford: Clarendon Press.

Carr, P. R. (2011). *Does Your Vote Count? Critical Pedagogy and Democracy* (Vol. 378). Berlin: Peter Lang.

Chinh, N. D. (2013). Cultural Diversity in English Language Teaching: Learners' Voices. *English Language Teaching*, *6*(4), 1-7.

Colgan, F., & Ledwith, S. (2002). Gender and diversity: reshaping union democracy. *Employee Relations, 24*(2), 167-189.

Crookes, G. V. (2013). *Critical ELT in Action: Foundations, Promises, Praxis*. NewYork: Routledge.

Cunningsworth, A. (1995*). Choosing your Coursebook*. Oxford: Heinemann.

Dewey, J. (1961). *Democracy and Education*. New York: Macmillan.

Dodd, C. H. (1992). The development of Turkish democracy. *British Journal of Middle Eastern Studies*, *19*(1), 16-30.

Entwistle, N. (1997). Introduction: Phenomenography in higher education. *Higher Education Research & Development*, *16*(2), 127-134.

García, E. E. (1994). *Understanding and Meeting the Challenge of Student Cultural Diversity*. Boston: Houghton Mifflin.

Geršicová, Z., & Barnová, S. (2018). Personal and social training as a part of class teachers' lifelong learning. *Acta Educationis Generalis, 8*(2), 24-39. https://doi.org/10.2478/atd-2018-0009

Humphrey, N., Bartolo, P., Ale, P., Calleja, C., Hofsaess, T., Janikova, V., & Wetso, G. M. (2006). Understanding and responding to diversity in the primary classroom: An international study. *European Journal of Teacher Education*, *29*(3), 305-318.

King, P. M., & Kitchener, K. S. (1994). *Developing Reflective Judgment: Understanding and Promoting Intellectual Growth and Critical Thinking in Adolescents and Adults*. San Francisco: Jossey-Bass Press.

Kottak, C. P. (2015). *Cultural Anthropology: Appreciating Cultural Diversity*. New York: McGraw-Hill Education Press.

Lee, M. W. (2014). A participatory EFL curriculum for the marginalized: The case of North Korean refugee students in South Korea. *System*, *47*, 1-11.

MacNaughton, G., & Hughes, P. (2007). Teaching respect for cultural diversity in Australian early childhood programs: A challenge for professional learning. *Journal of Early Childhood Research, 5*(2), 189-204.

Marton, F. (1981). Phenomenography - describing conceptions of the world around us. *Instructional Science*, *10*(2), 177-200.

Meier, D. (2003). So what does it take to build a school for democracy? *Phi Delta Kappa*, *85*(1), 15-21.

Midobuche, E. (1999). Respect in the classroom. *Educational Leadership, 56*(7), 80.

Mitchell, L. S. (1953). *Two lives: The story of Wesley Clair Mitchell and myself*. New York: Simon & Schuster.

Na, Y. H., & Kim, S. J. (2003). Critical literacy in the EFL classroom. *English teaching*, *58*, 143-164.

Ogbu, J. U. (1992). Understanding cultural diversity and learning. *Educational researcher*, *21*(8), 5-14.

Ooiwa-Yoshizawa, A. (2018). Implications of EFL critical pedagogy: Theory, practice and possibility. *Learning*, *19*, 245-253.

Otlowski, M. (2003). Ethnic diversity and gender bias in EFL textbooks. *Asian EFL Journal*, *5*(2), 1-15.

Öksüz, Y., & Güven, E. (2012). Farklılıklara saygı ölçeği (fsö): geçerlik ve güvenirlik çalışması. *The Journal of Academic Social Science Studies*, *5*(5), 457-473.

Ördem, O. A. (2018a). Modernization and popular culture: Views from Turkey. *Sociology and Anthropology*, *6*(7), 609-614.

Ördem, Ö. A. (2018b). Modernite Kültürü ve Türk Modernleşmesi. *Sosyoloji Notları, 2*(2), 210-221.

Ördem, E., & Ulum, Ö. G. (2019). Critical pedagogy and participatory approach in Turkey: Views of pre-service ELT teachers. *Electronic Turkish Studies*, *14*(2), 679-693.

Ördem, E., & Ulum, Ö. G. (2020). Gender issues in English language teaching: Views from Turkey. *Acta Educationis Generalis*, *10*(1), 25-39. https://doi.org/10.2478/atd-2020-0002

Özen, F. (2015). Evaluation of the attitudes of teacher candidates towards democracy and multicultural education. *Uluslararası Beşeri Bilimler ve Eğitim Dergisi*, *1*(2), 182-220.

Richardson, J. T. (1999). The concepts and methods of phenomenographic research. *Review of Educational Research, 69*(1), 53-82.

Sadeghi, S. (2008). Critical pedagogy in an EFL teaching context: An ignis fatuus or an alternative approach. *Journal for critical education policy studies, 6*(1), 277-295.

Svensson, L. (1997). Theoretical foundations of phenomenography. *Higher Education Research & Development, 16*(2), 159-171.

Thanh, N. C., & Thanh, T. T. (2015). The interconnection between interpretivist paradigm and qualitative methods in education. *American Journal of Educational Science, 1*(2), 24-27.

Uehara, D. L. (2005). Diversity in the classroom: Implications for school counselors. *Multicultural Perspectives, 7*(4), 46-53.

Wen-Cheng, W., Chien-Hung, L., & Chung-Chieh, L. (2011). Thinking of the textbook in the ESL/EFL classroom. *English Language Teaching, 4*(2), 91-96.

General Education Policy in Minority Schools in Georgia

Giorgi Momtselidze[*]

Abstract:
Introduction: The historical conditions that have developed over the centuries, as well as the migration processes of the 19th and 20th centuries, have determined the multi-ethnic composition of the country's population. Georgia, as a post-Soviet country, has been transitioning from totalitarianism to democracy for the last few years. The country is in the process of developing into an open, civil society; the modern concept of human-free development, the new principles and values of a civil society and the priorities of public consent placed the problem of ensuring the creation of tolerance in the foreground. Therefore, it is important to define the place and role of national minorities in modern social life.

The aim of the article is to determine the problems of non-Georgian general education schools in the educational space of Georgia and develop the necessary recommendations for the solution of these problems.

The object of the study is non-Georgian-language public schools in the territory of Georgia, where the teaching and learning processes of the representatives of national minorities is underway.

Purpose: The study will discuss the current situation in non-Georgian language general education schools. We will present the recommendations that we think will have a positive impact on the development of non-Georgian language educational institutions in the current education reform.

Methods: The article examines the situation in the state regarding the issue of general education of national minorities, international experiences, problems and the means of solving them. Through surveys, in-depth interviews, focus group, data collection, organisation, analysis and synthesis, attention was paid to three problematic issues. These were as follows: 1. low motivation of the students in non-Georgian language schools; 2. low level of knowledge of the state language among the students; 3. textbook availability in non-Georgian language schools of Georgia.

Conclusion: A content analysis was used to draw common conclusions. From the in-depth study of the materials, specific recommendations have been made regarding the effectiveness. The policies that were

---
[*] Giorgi Momtselidze, Grigol Robakidze University, Scientific Research Laboratory of Juvenology, Tbilisi, Georgia; g.momtselidze@gruni.edu.ge

implemented in relation to the national goals of general education in national minorities are less result-oriented and need to be improved.

Key words: national minorities, non-Georgian language schools, education policy.

Introduction

PIRLS/ePIRLS and PISA 2015 International Studies on the Academic Achievements of Ethnic Minorities. The analysis clearly shows that the average achievement of non-Georgian-speaking students in literacy is significantly lower than in Georgian-speaking students (Academic Achievements of Ethnic Minorities in International Assessments).

The data recorded on the school's graduation exams (computer adaptive testing) is also noteworthy, as the results of the 12th graders of non-Georgian language schools over the years were drastically lower than the results of the 12th graders of the Georgian language schools (Office of the Minister of State for Tolerance and Civil Integration of Georgia, 2014).

Based on the above, the research question was formulated as follows: what factors determine the low results of students in non-Georgian language schools compared to Georgian schools?

To research the causes, we held meetings with the target groups, where the directors and teachers of Tbilisi, Ninotsminda, Dmanisi, Gardabani and non-Georgian language schools were presented. Surveys were also conducted using a questionnaire and in-depth interviews. The following three main factors were identified as a result of the data analysis:

1. Low motivation of students - 15 %.
2. Low level of knowledge of the state language (both in teachers and students) - 37 %.
3. Existing textbooks - 48%.

1 Low motivation of students in non-Georgian language schools of Georgia

In terms of student motivation, it is important to note that not only are the minority members poorly informed about the ongoing processes in Georgia but also the majority of the Georgian population is unaware of the problems, history, culture, achievements and other characteristics of ethnic minorities. The lack of accurate information prevents the formation of an objective opinion towards the representatives of minorities. Because of this, unhealthy stereotypes replace objective information, which is also a deterrent for integration and the protection of human rights. This problem is enhanced by the fact that the school textbooks poorly reflect the traditions and other characteristics of ethnic minorities living in Georgia, which contributes to the alienation between the majority and the

minority. Representatives of ethnic minorities are often excluded from ongoing processes in the country. This is especially true for the minorities living in Samtskhe-Javakheti and Kvemo Kartli, who, among other problems, suffer from a lack of information about the ongoing processes in the country in a language that they can understand. Furthermore, there are a lack of special state programs that promote and encourage the employment of minorities in the central and regional governmental authorities. Ignorance of the state language is one of the main obstacles that prevents minority members from fully participating in state life. This is directly related to the protection of the rights of ethnic minorities. The work done in this direction does not have a significant impact nowadays, which is also a problem that must be solved by the state. All these internal or external factors lower the students' motivation, which in turn, affects their academic performance and literacy.

2 Low level of knowledge of the state language among students and teachers in non-Georgian language schools of Georgia

Due to complex factors, minority students in non-Georgian language schools have not been given the opportunity to study the state language to the extent that it would be sufficient for them to fully integrate into society. In 1997, the government approved a state programme for the study of the Georgian language in Kvemo Kartli and Samtskhe-Javakheti, or in regions where non-Georgian populations predominate. The developers of the programme said that the shortage of qualified Georgian language teachers in these regions is a particularly important obstacle to improving the quality of Georgian language teaching. Within the framework of the programme, the Georgian language, history and geography teachers took training courses. In non-Georgian language schools, the Georgian language teachers were given a salary supplement in the form of a grant to motivate them. Within the framework of the programme, teachers from other regions of Georgia were mostly sent from Rustavi and Tbilisi to minority regions. In 2004, in parallel with this programme, a competition for the selection of teachers of Georgian language, as well as history and geography in Georgian, was announced. Although they offered larger grants than before, the goal was the same, as follows: to create financial incentives for qualified teachers to move from other parts of Georgia to ethnic minority regions. Currently, several of these teachers teach Georgian language and literature, history and geography in Georgian in non-Georgian language schools. The new programme, "Teach and Learn in Georgia", which was created by the Ministry of Education, Science, Sports and Culture of Georgia, is noteworthy. It should be noted that most of the programme teachers do not speak the language in which the learning process takes place. This issue greatly complicates their perfect communication.

The UNESCO Interim Strategy (2002-2007) reads the following: "Education has become truly accessible, especially for those who have not previously been able to do so (the poor, women, rural population, minorities, refugees, people affected by natural disasters, people with special needs."

Although not all problems in Georgia have been finally solved in terms of access to education, a number of measures have been taken to make primary, secondary and higher education equally accessible to all, regardless of social, ethnic, religious, linguistic or worldview backgrounds. Article 13 of the Law of Georgia on General Education defines "neutrality and anti-discrimination" in general education schools, where we read the following: "The school is obliged to protect and promote the culture of tolerance and mutual respect between students, parents and teachers, regardless of their social, ethnic, religious, linguistic and worldview affiliation" (Article 13, paragraph 6); "On the basis of equality, the school protects the individual and collective rights of minority members to freely use their mother tongue, maintain or express their cultural identity." (Law of Georgia on General Education, 2005, Article 13, paragraph 7)

International Acts on Minority Education states that minorities not only have the right to maintain their identity through their mother tongue but also the right to integrate and participate in a wider national society through the study of the state language. Therefore, the diversity of representatives of national minorities in OSCE countries can be considered one of the most effective means of achieving the goals of international acts in the field of protection and integration of national minorities. Recommendations for primary and secondary education were created to provide the right path for the states in the field of education and implementation of educational policies and relevant programmes in the language of national minorities. The proposed approach is based on the results of research in the field of education and is a realistic interpretation of the relevant international norms.

Any assimilationist approach that teaches the curriculum only in the state language, and in which minority children are fully integrated into the majority children's class, contradicts international norms. This applies equally to isolated schools, where the entire educational programme is taught only in the native language of the minority during the entire educational process, and the language of the majority is either not taught at all or is taught only at the minimum level.

Over the years, the style of formulating minority rights in international norms has evolved. Passive formulas, such as "... individuals belonging to national minorities cannot be denied the right ...", as defined in the International Covenant on Civil and Political Rights (OSCE, 1996) was replaced with more positive, pro-active approaches, such as "... States will protect the ethnic, cultural, linguistic and religious identity of national minorities ...", according to a Copenhagen meeting document on the human dimension (OSCE, 1990). Therefore, it is important for the state to make more efforts to increase the

competence of the state language proficiency level, first among teachers, and then among students.

3   Textbooks available in non-Georgian language schools of Georgia

This factor, which most respondents (48 %) focused on, is the topic of textbooks. In the non-Georgian language schools, the main textbooks in grades I-VI are bilingual, and in grades VII-XII, they are mainly in native (Russian, Armenian, Azerbaijani) languages. That is one of the most challenging issues regarding minority education in Georgia (Tabatadze, 2017). In the process of studying this issue, using the case-study method, non-Georgian language textbooks were developed together with the subject departments of the schools. The analysis of the material revealed the following types of problems:

- Non-Georgian language schools, unlike Georgian language schools, do not have the freedom of choice of textbooks.
- In the bilingual textbooks, the text is divided into Georgian and non-Georgian parts according to the paragraphs, which creates a number of difficulties for the student. In particular, if s/he does not know both languages thoroughly, s/he will not be able to combine the text and will study only a part of the text written in a language s/he understands. Therefore, the student will not be able to connect or complete the text and therefore, they will develop high thinking skills.
- During the lesson, the teacher has to translate an unknown part of the text to the student. As a result of this, the teaching time lacks certain activities. Unlike Georgian-language schools, less time is left for the second and third phases of the lesson, which is important for the development of high thinking skills.
- Qualified bilingual specialists remain a problem in non-Georgian language schools. Mostly, the lessons (despite the bilingualism of the textbooks in grades I-VI) are monolingual.
- Dictionaries of terms are almost non-existent in bilingual textbooks, which is one of the most important issues for students to be able to understand the material to be studied in both languages.
- All textbooks in grades VII-XII are monolingual. We find textbooks that are only in Georgian (for example, VII-XII grades of music and art textbooks).
- Programme incompatibility for students of VII-XII grades with the material of the relevant class of Georgian language school (for example: ninth grade mathematics textbooks).
- Part of the assignments in English language textbooks are only in Georgian, which hinders the student's ability to learn independently.
- The issue of textbooks is more acute in science subjects. Physics textbooks are defined for trimester teaching (which is no longer available in schools),

except in grades XI and XII (physics is no longer taught programmatically in Grade XII, although the textbook exists). The textbooks are not bilingual.

- Chemistry textbooks are old editions (2008-2010). The subject of chemistry in Georgian language schools starts in the eighth grade, and in the ninth grade, in a non-Georgian language. In the ninth grade, the teacher is forced to use three textbooks because the offered ninth grade book is a direct translation of the textbook of the Georgian school.
- The seventh grade biology textbook is also intended for trimester teaching. The ninth grade textbook does not exist at all. Schools use the eighth grade textbook for Georgian schools.
- Some problems arise when studying their native language and literature. Artificial barriers to state and patriotic upbringing are being created. These textbooks have been published in neighbouring countries and are ideologically represented. This issue poses a certain threat to the national goals of general education.

It is noteworthy to consider the number of non-Georgian language schools in Georgia and their sustainability over the years. An analysis of statistical data for 2007 and 2013 shows that the number of non-Georgian language schools in dynamics has sharply decreased.
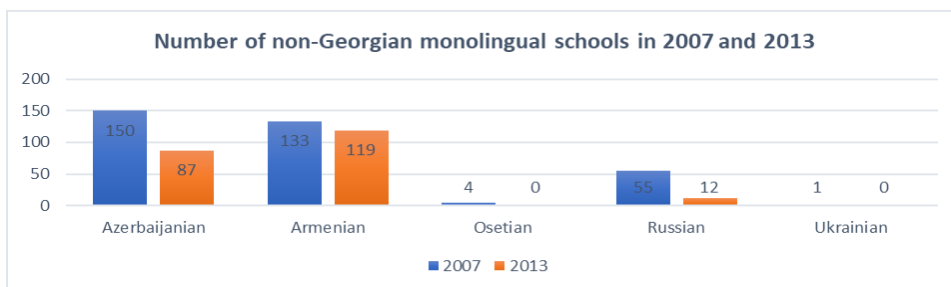
Figure 1. Number of non-Georgian monolingual schools in 2007 and 2013.
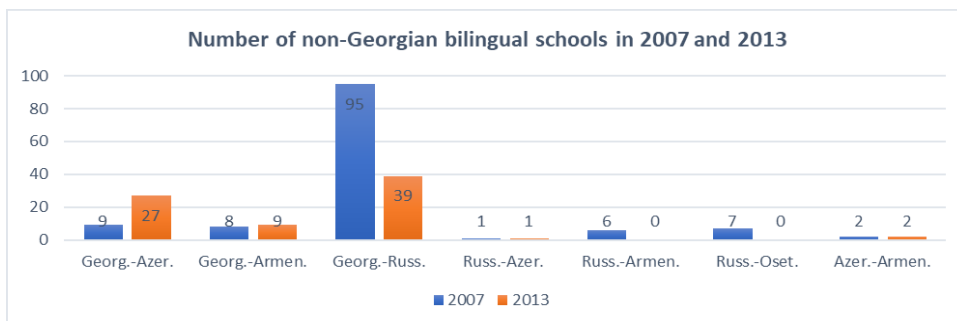
Figure 2. Number of non-Georgian bilingual schools in 2007 and 2013.
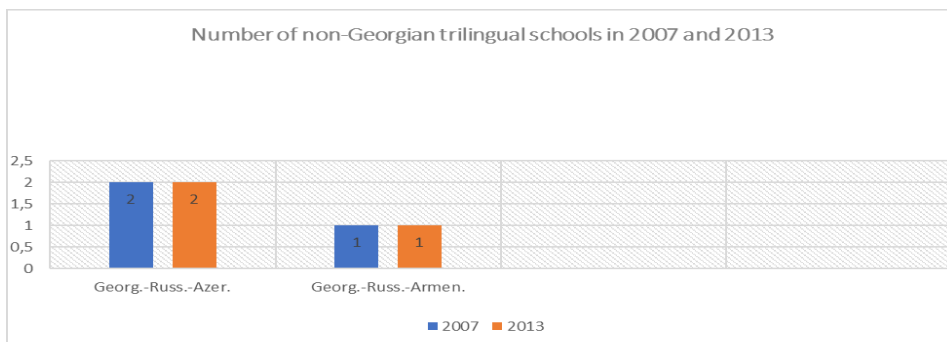
Figure 3. Number of non-Georgian trilingual schools in 2007 and 2013.

Some members of ethnic minorities have expressed great confidence in Georgian schools, and they are enrolling their children in the first grade (mostly the Azerbaijani-speaking population in the Kvemo Kartli region). However, Georgian schools were not prepared to meet this challenge. A first-grader who speaks only his native language, does not speak Georgian and is enrolled in a Georgian school will struggle to communicate with his teachers (it makes sense that Georgian school teachers do not speak their native language) and classmates. It is easy to imagine how many problems will be associated with the development of high thinking skills in a class where 40 % - 45 % of students do not speak the state language.

The National Concept of Tolerance and Civic Integration and the Evaluation Document for the Implementation of the 2009-2014 Action Plan discuss final school exams, which are no longer valid in Georgia since 2018.

According to the results of the 2012 final exams, here is the number of students admitted to the subjects - students of non-Georgian language schools of compact settlements (Akhalkalaki, Ninotsminda, Marneuli, Bolnisi, Dmanisi, Aspindza).

Table 1

The number of students admitted to the subjects - students of non-Georgian language schools of compact settlements

Subject	Number of exam takers	Passed	Could not pass	% of failed students
Georgian	2262	1936	326	14.41202476
Maths	2288	1711	577	25.21853147
Foreign Language	2328	2101	227	9.750859107
History	2210	1987	223	10.09049774

Geography	2222	2039	183	8.235823582
Biology	2227	1896	331	14.86304445
Chemistry	2237	1994	243	10.86276263
Physics	2290	1604	686	29.95633188

According to the results of the 2012 final exams, here is the number of students who passed the exams across Georgia.

Table 2

The number of students who passed the exams

Subject	Number of exam takers	Passed	Could not pass	% of failed students
Georgian	39444	38691	753	1.909035595
Maths	39621	38457	1164	2.937835996
Foreign Language	39625	38169	1456	3.67444795
History	38931	38304	627	1.610541728
Geography	38814	38000	814	2.097181429
Biology	38766	37727	1039	2.680183666
Chemistry	38817	38221	596	1.535409743
Physics	38981	37208	1773	4.548369719

A large number of students in non-Georgian language schools in 2011 did not exceed the minimum threshold. Of the 4,110 students, only 2,500 students were able to meet the requirements for the final exams. Regarding the statistical analysis that was presented in 2012, there is a big difference between the indicators of non-Georgian and Georgian language school students. The percentage of the students who failed the exams and who graduated from non-Georgian language schools varies from 8.23 % to 29.95 % in various subjects. The same rate ranges from 1.53 % to 4.54 % across Georgia. Therefore, we can conclude that the quality of teaching in non-Georgian language schools is much lower than in Georgian language schools. This factor explains the international research of PIRLS/ePIRLS and PISA 2015, as well as why we have results that speak about the academic achievements of ethnic minorities and why the average achievement of students in literacy results in non-Georgian language schools is significantly lower than in Georgian students.

Conclusion

In conclusion, although there is a clear record in the 2018 National Curriculum - "1. In schools where students from national minorities study, the development of book speech in the state language is a priority, one of the tools of which is bilingual education. Bilingual education involves the use of two languages in the teaching-learning process, which forms the basis of bilingual literacy. 2. When introducing the bilingual education model, the school should give the adolescent the opportunity to master the native language in the native language according to his/her age. The educational content of each subsequent stage of the introduction of bilingual education should be based on and develop the knowledge and skills acquired at the previous stage" (National Curriculum Article 2011-2016), the issue of textbooks is still one of the main challenges in non-Georgian language schools. Currently, the Ministry of Education, Science, Sports and Culture of Georgia is actively working on a solution, and in the 2019-2020 academic year, new bilingual textbooks will be included in grades I-VI in non-Georgian language schools. The circumstances to be considered are as follows: raising the language competence of teachers in the state language; texts, rather than paragraphs dropped from contexts, with content translations; dictionaries of terminology should appear in bilingual textbooks; paragraphs of ideological content of other countries should be reviewed in the native language and literature and removed at the level of the school's policy.

It is also important to define the policy of certification of native language teachers in non-Georgian language schools. To date, these teachers have not been fully involved in the teacher's career advancement scheme, nor have they been able to receive a salary supplement. Russian language teachers (who teach in Russian language schools) who obtained the certificate after passing the exam in 2011-2012, have not yet been recognised by the state, and the exam for Armenian and Azerbaijani language teachers cannot be held today. This issue dramatically violates the rights of native language teachers in non-Georgian language schools. To regulate this issue, it is important to coordinate the work of legal entities of public law within the Ministry of Education, Science, Sports and Culture of Georgia. Additionally, over the years, despite the efforts of the National Curriculum Department of the Georgian and non-Georgian schools, the problem remains of the issue of compatibility of the software, the OSCE (1990) recommended for minority rights, the pro-active approach or acting in accordance with the Copenhagen Document, Article 31, which calls on them to take special measures to ensure the full equality of members of national minorities. To this end, it is important to create specific working groups that will be staffed with policymakers, industry experts and subject matter experts.

For the coordinated solution of the problems outlined in the article, I believe that it is important to create an ethnic minorities policy office in the Ministry of the Education, Science, Sports and Culture. This would ensure the development of a policy and the implementation of various government agencies, international

organisations, NGOs obo sector and the public defender's office. Its area should be not only general education but also in pre-school, higher education, culture and sports. The service should ensure compliance with the recommendations issued by the various agencies. For example, judging by the examples discussed in this article, the Ministry of Education, Science, Sports and Culture of Georgia has not yet been able to implement recommendations, such as the OSCE's Recommendations on Minority Rights, Article 31 of the Copenhagen Document, "Tolerance and National Integration Strategy and Action Plan for 2009-2014 performance assessment document", prepared by the Georgian State Minister's office on tolerance and civic integration, the Report of the Public Defender of Georgia (2018), human rights and freedoms situation and several recommendations prepared by the Non-Governmental Organization Civil Integration and Inter-Ethnic Relations Centre (2014).

This is a small list, and it is important to consider it in the shortest possible time, as the problems will be duplicated during the policy-making process.

References

Academic Achievements of Ethnic Minorities in International Assessments (PIRLS, ePIRLS and PISA). Retrieved from https://naec.ge/#/ge/post/1759

Center for Civil Integration and Inter-Ethnic Relations. (2014). *A study of the effectiveness of general education voucher funding in the context of equality.* Tbilisi. Retrieved from https://www.cciir.ge/images/pdf/vaucheri.pdf

Center for Civil Integration and Inter-Ethnic Relations (2011). *Issues of State Language Teaching; Problems and Challenges*. Tbilisi.

Law of Georgia on General Education. Article N13.

National Curriculum Article 2011-2016, 8-1. Linguistic education in non-Georgian language schools/sectors.

Office of the Minister of State for Tolerance and Civic Integration of Georgia. (2014). *National Document for Evaluation of Tolerance and Civil Integration and Evaluation of the Implementation of the Action Plan for 2009-2014*.

OSCE. (1990). *Copenhagen Meeting Documents on the Human Dimension*. Retrieved from https://www.osce.org/odihr/elections/14304

OSCE. (1996). *The Hague Recommendations on the Education Rights of National Minorities*. Explanatory Note. Retrieved from https://www.osce.org/hcnm/hague-recommendations

Report of the Public Defender of Georgia on the Situation of Human Rights and Freedoms in Georgia (2018).

Tabatadze, Sh. (2017). Minority Education in Georgia: Is It Delivering What is Expected? *Diaspora, Indigenous, and Minority Education, 11*(1), 17-30, https://doi.org/10.1080/15595692.2016.1245658

UNESCO Intermediate Strategy (2002-2007).

Exploring the Quality of Pupils' Financial Literacy

*Jozef Lukáč - Lenka Danková - Slavomíra Stašková - Marek Meheš - Zuzana Kudlová**

Abstract:

Introduction: Education is an important tool for improving many aspects of life, including socio-economic status or well-being. The paper is aimed at monitoring the financial literacy of pupils in Eastern Slovakia.

Methods: The contribution will contain the results of the survey. We analyse in detail the theoretical definition of financial literacy, strategy and measures of the state administration bodies in the field of improving financial literacy of more than 2000 pupils.

Results: The result of the research paper is an analysis of the achieved data and their characteristics.

Discussion: This part of the research paper deals with the areas of financial literacy of pupils in Slovakia. Education is an important tool for improving many aspects of life, including socio-economic status or well-being.

Limitations: Participants of the electronic questionnaire participated in the answers according to the activities and projects prepared by a particular elementary school.

Conclusion: Higher life expectancy, pension reforms, the availability of a more comprehensive range of financial products and services mean that the ability to make well-informed financial decisions is increasingly considered an important life skill. If a school fails at certain points during a child's study, it is assumed that this will have a negative long-term impact on the child's life in the future, as ending a school without sufficient qualifications can lead to difficulties in ensuring equal participation in the financial, civil and social aspects of modern society.

---

* Jozef Lukáč, University of Economics in Bratislava, Department of Corporate Financial Management, Bratislava, Slovakia; jozef.lukac@euke.sk

Lenka Danková, University of Economics in Bratislava, Department of Corporate Financial Management, Bratislava, Slovakia; lenka.dankova@euke.sk

Slavomíra Stašková, University of Economics in Bratislava, Department of Corporate Financial Management, Bratislava, Slovakia; slavomira.staskova@euke.sk

Marek Meheš, University of Economics in Bratislava, Department of Corporate Financial Management, Bratislava, Slovakia; marek.mehes@euke.sk

Zuzana Kudlová, University of Economics in Bratislava, Department of Corporate Financial Management, Bratislava, Slovakia; zuzana.kudlova@euke.sk

Education is an important tool for improving many aspects of life, including socio-economic status or well-being.

Key words: financial literacy, research, elementary school, money, PISA, quality of education.

Introduction

The education system, which is a subsystem of every modern social system, should always be objectively and reliably monitored by a number of tools developed to do so. The reasons are obvious. Indeed, if certain resources are invested in the development of such a system, whether public or private, we always want to be able to verify as accurately as possible how effective their use is. This means whether predefined intentions or goals are achieved. We must monitor whether the goals defined by the education system are achieved at the required quality. The presented study is devoted to the issue of financial literacy of primary school pupils in Eastern Slovakia. The issue of financial literacy among pupils and secondary schools has been monitored over several years. The best-known assessment is PISA. Most recently, it was conducted in the first half of 2018. Financial literacy is not only studied in primary and secondary school pupils, but it is measured despite the population's demographics, whether it is retirees, young people under 30, or the mentioned students and pupils.

1   Theoretical background of the study

Authors from different countries of the world have devoted themselves to the problem of financial literacy. However, opinions on this subject are similar in many ways. Financial literacy is by Balaban (2011) defined inconsistently, often happens that different entities that deal with it, have different definitions. There is no uniform approach to financial literacy in the Anglo-American area either. In the United States, the term "financial literacy" is well-known, while in the UK we are more likely to encounter "financial capability", so it is possible to name it - financial competence. Financial competencies are closely linked to financial literacy, however, they should not be used as interchangeable terms. Roulet's (2009) definition of financial literacy refers in particular to knowledge Financial Competence refers to the ability to adequately apply this knowledge and skills in real situations. Financial literacy refers mainly to knowledge. He refers to financial competencies as being able to use this acquired knowledge adequately in real situations. Financial literacy is a narrower term that emphasizes objective knowledge of specific topics related to money, economy or financial affairs (Policy Research Iniciative, 2004). PISA defines financial literacy as knowledge and understanding of financial concepts and risks, the ability, motivation and self-confidence of the individual to use the knowledge gained in order to implement effective decisions in different situations relating to finances, with the

aim of improving the financial situation of the individual and society, thereby enabling them to engage in economic life (National Report PISA, 2015). Financial literacy is, according to Mahdzan, et al. (2013) a key skill and knowledge the individuals need to survive in a modern society. Orton (2007) understands financial literacy as the ability to read, analyze, manage and communicate about personal financial conditions that affect material well-being. It includes the ability to make appropriate financial decisions, discuss money and financial issues without (or in spite of) inconvenience, plans for the future, and responsibly respond to life events that affect daily financial decisions. Financial literacy can also be seen as an individual's ability to understand the financial product, to appreciate financial risk through its capabilities, knowledge and trust in information-based decision-making. It includes identifying sources of financial advice and effective measures to improve the individual's financial well-being (James, 2009). By financial literacy, we can understand a set of skills and knowledge that enable individuals to make appropriate financial decisions. To financial literacy, which provides these skills and knowledge is in the literature devoted a considerable amount of attention (Kcharchenko, 2011, Hasajová, 2017).

Krechovská (2015) characterizes financial literacy as the ability to secure personal income, ability to make expenditure decisions, understand the consequences of a personal decision on current and future income as well as labor market orientation. Kozina et al. (2015) defines financial literacy as a component of human capital used in financial activities to increase the financial well-being of the individual. The importance of financial literacy is therefore important for individuals and society because of their implications for wealth creation and financial prosperity (Van Rooji et al., 2012). According to the National Financial Education Strategy (Czech Republic, 2010), the concept of financial literacy is divided into groups:

1. Money literacy, which is the competence necessary to manage cash and cashless money and transactions with them and management tools designed for this purpose (e.g. current account, payment instruments).
2. Price literacy is the competence needed to understand price mechanisms and inflation.
3. Budget literacy is the competence necessary to manage a personal/family budget (for example, the ability to manage the budget, set financial targets and decide on the allocation of financial resources) and also includes the ability to manage different life situations from a financial point of view. Budget literacy also includes two specialized components:
   - financial asset management (e.g. deposits, investments and insurance),
   - the management of financial liabilities (e.g. loans or leasing).

Several studies have addressed the impact of the environment on the level of children's financial literacy. Agnew et al. (2015) noted that the timing of the first financial discussion of household individuals affects their future financial

literacy. Sohn et al. (2012) note that family communication on financial matters is decreasing with age, but mutual communication increases with age. This means that parental impact on children's financial literacy is increasing at a slower pace, while the influence of peers is growing. Gradually, as a child will grow up, he will be exposed to several socializing agents. Children will learn about managing money by interacting with these "agents." Duflo et al. (2002) found that peers play an important role in the decision-making of individuals, e.g. on pension savings. We can perceive a strong influence of peers in gambling, betting in young people (Shim et al., 2010). The impact of educational programs on financial literacy was assessed by Agmair et al. (2018). Research shows that financial education programs in schools can improve financial knowledge and attitude towards children's financial decisions. Experiential learning is an appropriate method for teaching financial literacy at primary and secondary schools. At the universities, emphasis should be placed on specific case studies from students' practical life events. Zhu et al. (2018) also made a measurement of financial literacy of Chinese children in Hong Kong through the coefficient Financial Fitness for Life.

The results of the study specify the critical role of parents, offer specific entry points for policy makers and educators and at the same time they give parents advice that has a positive impact on the development of financial literacy among adolescents. Hazudin et al. (2018) focused in his study on the interconnection of mathematical and financial literacy. Knowing how to use logic and mathematics creates the basis for good analytical thinking and decision-making skills. This can have a significant impact on the relative long-term sustainability of an individual's life. The result of the study is the assessment of the significant impact of mathematical literacy on financial literacy by comparing the results of university students. The author Koutníková (2017) focuses on the connection between economics and student education. Mareš (2017) also researches financial literacy in schools.

Financial literacy in Eastern Slovakia was dealt with by Vavrec (2014). He focused on the level of financial education of the population, providing financial education and forms and ways of learning. The results yielded curious findings, respondents indicated that financial education is considered as very important or important to almost 87% of respondents. Only 5% consider it unnecessary.

Survey respondents in 58% consider their financial education to be very good, respectively rather good, 40% of respondents consider their knowledge to be inadequate or insufficient, whereas 2% of respondents were indifferent, so they could not estimate their skills in this field. 45% of respondents would welcome the introduction of financial education to schools, and 20% of respondents would prefer to participate in training and financial courses. A total of 85% of respondents support education in this area.

2   Research

The aim of the paper is to evaluate the financial performance of pupils at primary schools in Eastern Slovakia in the area of financial literacy. As financial literacy is a fairly broad term, it contains several subcategories, such as financial markets, insurance, savings, financial derivatives and commodities; this research was directed only to one of these subcategories. The focus was primarily on the area of money, the perception of their value, and the ability to logically address questions about the common European currency. Research questions are: How do primary school pupils master the basic questions about money? Can they properly understand the question and then logically assess the causal implications using mathematical literacy? How pupils perceived to use the euro common currency within the European Union? As a result of these sub-questions, the answer to the underlying and fundamental question will be: "Do primary school pupils in Eastern Slovakia have knowledge of financial literacy issues?"

An electronic questionnaire entitled "Financial literacy" - the perception of money and its values by pupils of elementary schools in Eastern Slovakia was sent to all primary schools in Eastern Slovakia which had an e-mail address entered in the database of elementary schools led by Ministry of Education in the Slovak Republic. The school selection criterion was the number of pupils over 100. The questionnaire was intended for lower secondary pupils (5th to 9th year). Overall, 402 interviews were conducted with primary schools in the Prešov and Košice regions. After processing the results, we can conclude that 74 elementary schools participated in the completion of the electronic questionnaire.

A total of 2,863 questionnaire visits are registered 2,096 questionnaires were filled in by pupils from the Prešov and Košice self-governing regions. 290 questionnaires were unfinished and 477 only displayed. We can conclude that the overall success rate of the questionnaire is 73.2%.

Using Survio and Excel tools, we have reached the results that are part of the next chapter.

In this section we will focus on the assessment itself individual questions we will focus the evalution of the responses with an emphasis on analyzing the results. The first set of questions in the questionnaire survey were classification questions. These were related to the gender, the year of attendance, and the elementary school district of the pupil. The questionnaire was completed by 2,096 pupils, of which 51.4% were boys and 48.6% were girls. We can say that the representation of boys and girls was about the same. For more information, see Figure 1.
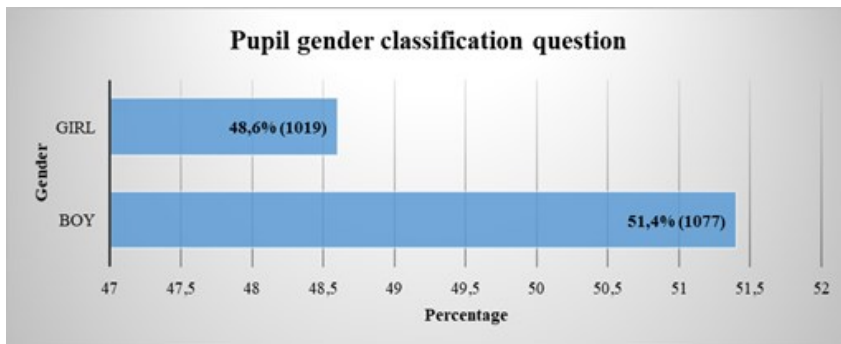
Figure 1. Classification question of pupils' gender (Source: own processing).

The next classification question concerned the representation of the pupils themselves. Based on the dataset and the participation of the pupils involved, we see a balanced representation of pupils from the fifth to the ninth year of primary school.
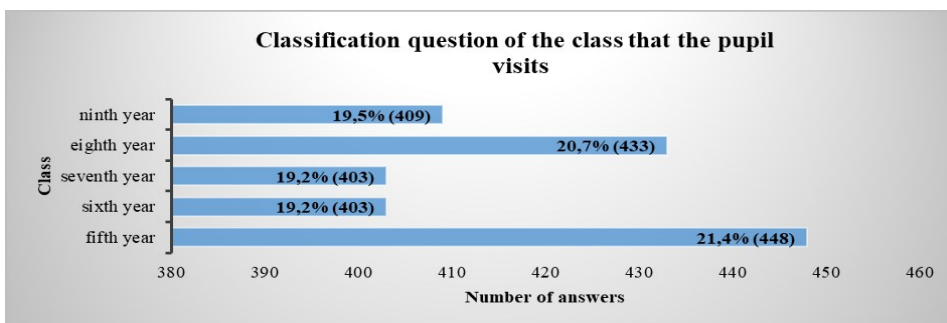

Figure 2. Classification question - year of elementary school attended by the pupil (Source: own processing).

As for the representation of pupils by region, the largest number is represented by the district of Michalovce 17.3% with the number of completed questionnaires 363. The Michalovce district is followed by the Spišská Nová Ves district with 11.3%, Trebišov district with 9.9%, Vranov nad Topľou district with 9.3%, Kežmarok district, where 8.2% of pupils participated. Representations also include the districts of Bardejov, Humenné, Poprad, Prešov, Sabinov, Snina, Stará Ľubovňa, Košice I. to Košice IV., Košice surroundings and Rožňava district. The survey did not involve pupils from the districts of Stropkov, Svidník, Levoča, Medzilaborce, Gelnica and Sobrance.
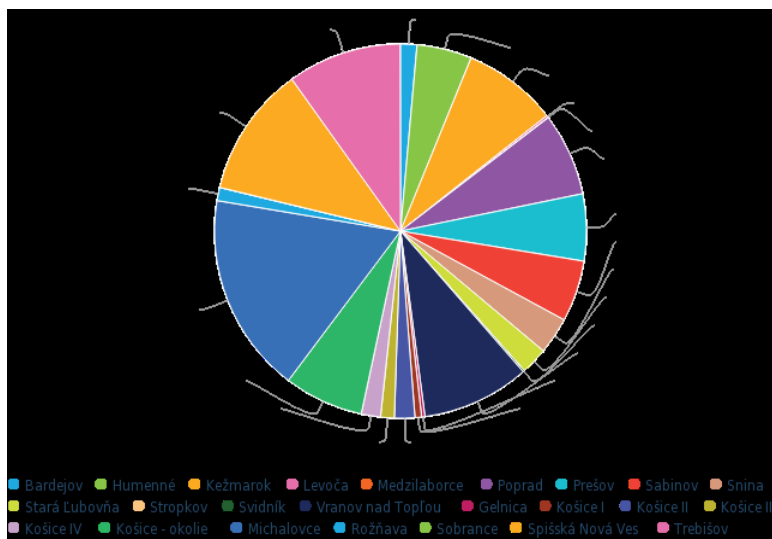
Figure 3. Regional representation of pupils (Source: own processing).

As mentioned in the previous section, 74 primary schools from the Prešov and Košice self-governing regions were involved.

The following question was the perception of learning, respectively discussing financial literacy at primary school attended by the pupil. The question was thus focused on the perception of the presence of a financial literacy theme at school. 73.2% of students said that the issue of financial literacy has been paid attention to their school. However, 26.8% of pupils do not remember any lecture, workshop or other activity that focuses on financial literacy.
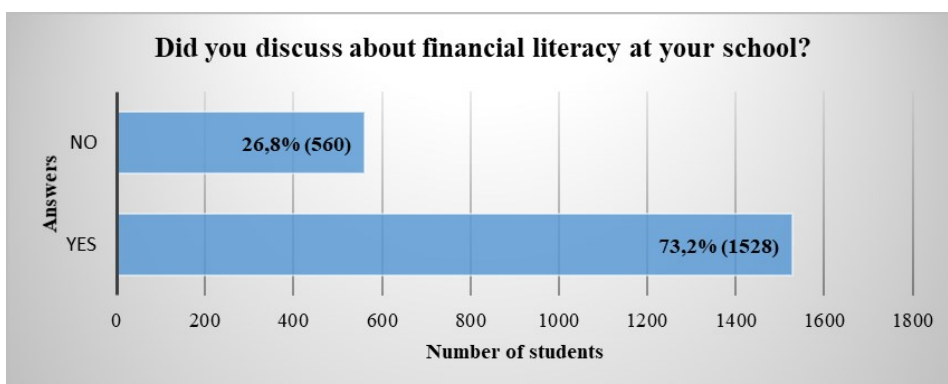
Figure 4. Discussion about financial literacy at school (Source: own processing).

Using a credit card of another member of the household, parents or siblings, was part of the next issue. As a result, only 20% of pupils can normally use another

household member's payment card and more than 80% of pupils do not use this option.
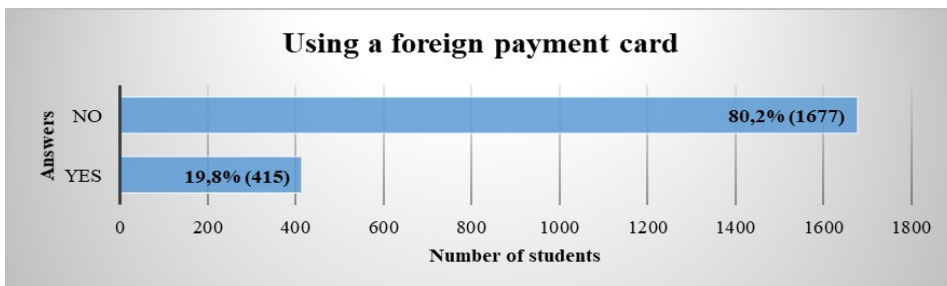

Figure 5. Using a payment card by another household member (Source: own processing).

Saving your own money – another issue where 86.5% of students said they were saving money. 13.5% of pupils do not save money.
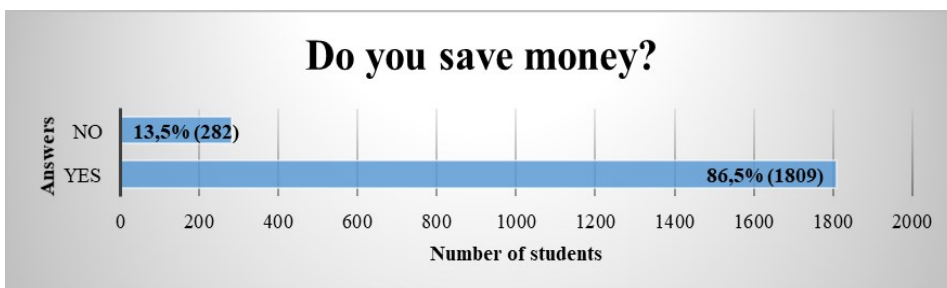

Figure 6. Saving money (Source: own processing).

Another task for the pupils was to properly rank the nominal values of money from the highest to the lowest. This question was evaluated by means of the weights (significance) that the pupils identified for each response. It should be noted that the pupils should sort the options as follows: 400 EUR, 250 EUR, 200 EUR, 100 EUR, and it should be noted that these values are arranged differently in the questionnaire. Instructions were as follows: Peter started saving for a new bike two years ago. When he broke the piggy bank, he made pits according to the value of money. Your task is to sort the value of Peter's money from highest to lowest.

Table 1

Determining the Sequence – nominal value

Answer	*Importance*
4 pcs of 100 euros	2.6
50 pcs of 5 euros	2
100 pcs of 2 euros	1.7
10 pcs of 10 euros	1

Source: own processing

Importance should be listed as follows: for first answer 4, for second 3, for third 2, and for last 1. It was a simple task where it was necessary to multiply the number of banknotes and coins by their nominal value and then rank them from the highest to the lowest. Based on the results, it can be stated that the pupils have correctly stated that 10 pieces of 10 € will have the lowest nominal value. The problem occurred with other possibilities, where several students determine the wrong option.
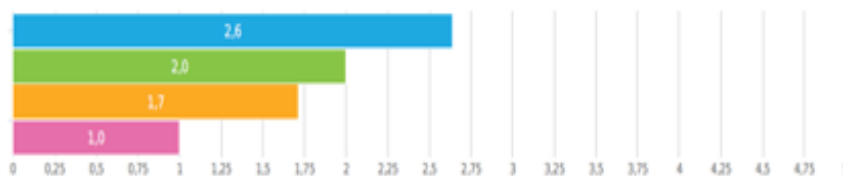

Figure 7. Determining the sequence - nominal value (Source: own processing).

Many of the students involved made incorrect mathematical adjustments, which led to incorrect results. In the case of 65% of pupils, the answer correctly determined 100 EUR, 66% of pupils determined 50 EUR, 85% of pupils correctly determined the value of 2 EUR.

The next question in the questionnaire was as follows: Anna's cousin Jakub came from Prague for the holidays. Anna decided to show him the reverse side of Slovak euro coins, she asked her mother to give her all the coins she has in her wallet. Can you help Alice choose Slovak euro coins? Pupils had a choice of coins in the following order: Estonian twenty cents, Slovak koruna, Czech crown, Polish zloty, Slovak five eurocent, Finnish euro, Slovak fifty eurocent, Hungarian forint and Slovak two euro coin. Students could set any number of options on this issue. The results are shown graphically.

Table 2

Results of question about Slovak Euro coins

Answer	Number of Answers	Share
Option 1	82	3,90%
Option 2	226	10,80%
Option 3	180	8,60%
Option 4	28	1,30%
Option 5	1810	86,80%
Option 6	377	18,10%
Option 7	1843	88,40%
Option 8	45	2,20%
Option 9	1991	95,50%

Source: own processing

Pupils did not have the problem of correctly identifying Slovak euro coins, which are in option 5 - 86.8% success rate, option 7 - 88.4% success rate, and options 9 - 95.5% success rate.

As a catch, we set the option 2 Slovak crown, but despite the fact that pupils can only remember the use of this coin, 10.8% of pupils identified it as a Slovak euro coin.

Figure 8. Share of responses about Euro coins (Source: own processing).

Likewise, the students were mistaken for the Finnish euro, which has the same size and color, but another graphical representation, but 18.1% of the pupils also marked this coin as Slovak. Pupils also marked the Czech crown (8.6%) as Slovak euro coins, which they can meet at the time of their visit to the Czech Republic.

The following question related to the issue of the benefits of euro payments in European Union countries. The vast majority of pupils (more than 95%) stated the advantage of paying the common currency, no need to change money when visiting another Member State, the possibility to compare prices in stores at home and abroad.

Interesting answers were selected:

"I think that continuing to use the euro is better - prices are easy to compare. Even though I do not remember the time when Slovaks lived only with crowns, if we had paid and earned crowns so far, we would have been better off."

"We don't have to turn money into a bank. We can pay by card. We don't have to recalculate money to another country's rate. We can compare prices in stores."

"The European Union is helping states that are in monetary union, giving them money – even that is an advantage."

The next question was to create a variety of payment options at the store. The question was as follows: Please provide at least 3 options for the Novotna family to pay 15 euros in the shop. The problem is that they only have 5 euro, 2 euro and 1 euro coins in their wallet.

The pupils understood this question and more than 83% of the pupils mastered this question and correctly determined the payment options for the Novotna family. In some cases, pupils also voluntarily set another option for payment with the help of banknotes and coins.

The pupils also answered the question:

Class 6.B from Vranov nad Topľou decided to end the school year with a joint trip in the High Tatras. There are 32 pupils in the classroom, but 12 of them do not attend the trip. What will be the total budget of pupils wishing to go on a trip if each pupil pays 20 euros?

It is clear that the sum of 400 euros should be the right answer. 81.73% of pupils answered correctly this question correctly, which means 1,610 correct answers. 486 pupils responded incorrectly, accounting for a percentage of 18.27 incorrect answers. The mistakes in the answers were mainly in the misunderstanding of the text. Pupils often mentioned only the number of children participating in the trip, not the total amount. Therefore, they simplified the task to subtract the total number of pupils from the non-participating ones and did not calculate the overall budget. They simplified the task by simply subtracting the total number of pupils from those who did not attend the trip and thus not calculating the overall budget. There were often number 240 in the answers, so pupils calculated the budget of the non-participating pupils. Again, it was a misunderstanding of the given question; the pupils did not read the question with understanding. There were also rare cases where pupils used a wrong mathematical operation - instead of using a product they used a sum.

The last question, was aimed at solving the set situation and oriented (again as a previous question) to the correct understanding and calculation of the amount. Alice was engaged in helping elderly people out of their town by selling

magazine. Alice remains 50% of her sales price, while the magazine sells for 3.40 euros. How will Alice help old people by selling magazines? The correct answer is 5.10 euros.

43.36% of pupils responded incorrectly and 56.64% of pupils stated the correct answer. On this issue, however, there is a noticeably lower percentage success rate. In the question it was necessary to divide the amount for one magazine into half and then multiply by three. As we can see from the results of the questionnaire survey, the pupils of the East Slovak region had problems with this operation. Compared to the previous question, the success rate fell by more than 25%. The four most common errors were repeated in the question:

1. *Pupils put 3.4 € in their answers without multiplying the amount by three magazines.*
2. *Frequently occurring response to the amount of € 10.2, pupils multiplied correct answer number two, we assume that this was due to the fact that 50% remains Alice.*
3. *Although the amount of 3,4 € was correctly divided into half, they did not take into account the number of magazines.*
4. *The opposite is when pupils did not divide the sum of € 3.4 by two but multiplied by the number of magazines.*

At the end of the questionnaire we asked students whether they were already thinking about the vocation they would like to pursue in the future. Approximately 15% of pupils were not able to indicate what kind of work they would like to do in the future. The most represented jobs: teacher, mason, dentist, cop, IT technician, translator, hairdresser, veterinarian, car mechanic, salesman, soldier, chef, fireman, actress and singer. Among the most interesting jobs we have included the following answers: nuclear physicist, digital media designer, midwife, violinist, judge, international tourist guide or humanitarian worker, professional ballerina, meteorologist, hippotherapist, priest, soccer player, forensic pathologist, historian, etc.

Conclusion

The research goal was as follows - to find out if pupils of the lower secondary school based in Eastern Slovakia can understand, answer, define or express an opinion on questions focusing primarily on money, the perception of the euro currency within the European Union, or pricing on a number of variations of issues where mathematics and logic need to be used. We can say to the results of the electronic questionnaire that we are first and foremost pleased that 2,094 elementary school pupils in eastern Slovakia were involved in our research. Based on the answers from the students, we can state that the most common mistakes did not occur with bad mathematical adjustments, but from a misunderstood read text.

We also tried to theoretically define the concept of financial literacy through the view of several authors and organizations working in this field. The issue of

financial literacy is covered by the Ministry of Education, Science, Research and Sport of the Slovak Republic. It focuses on its website important documents, support materials, and Internet links to support financial literacy teaching; especifically, the National Financial Literacy Standard or the Financial Literacy Methodology. The National Financial Literacy Standard is a strategy for financial education and personal finance management. However, not only the Ministry, but also the schools themselves should give more room in this area through discussions, workshops, case studies and other activities that would enhance students' knowledge of finance, insurance, financial and mortgage markets, capital and other similar topics.

References

Agnew, S., & Cameron-Agnew, T. (2015). The influence of consumer socialisation in the home on gender differences in financial literacy. *International journal of consumer studies, 39*(6), 630-638.

Amagir, A. (2018). A review of financial-literacy education programs for children and adolescents. *Citizenship, Social and Economic Education*, *17*(1), 56-80.

Balabán, Z. (2011). *Slabikář finanční gramotnosti: učebnice základních 7 modulů finanční gramotnosti.* Praha: Cofet.

Duflo, E., & Saez, E. (2003). The role of information and social interactions in retirement plan decisions: Evidence from a randomized experiment. *The Quarterly journal of economics, 118*(3), 815-842.

Ferencová, J., Stovíčková, J., & Galádová, A. (2015). PISA 2012 Národná správa Slovensko. Bratislava: NÚCEM.

Hasajová, L. (2017). Financial literacy as a fundamental strategy of effective learning. *R&E SOURCE, 12*, 45-50.

Hazudin, S. F. (2018). The relationship between previous mathematics performance, and level of financial literacy and financial well-being of university students. In *AIP Conference Proceedings* (p. 050001). AIP Publishing.

James, E. (n.d.). *The Case for Financial Literacy in Developing Countries.* World Bank/OECD/DFID. Retrieved from http://www.oecd. org/dataoecd/ 35/32/43245359. pdf

Kharchenko, O. (2011). *Financial literacy in Ukraine: Determinants and implications for saving behavior.* Ukraine: Kyiv School of Economic.

Kozina, F. L. (2015). Financial literacy of first-year university students: The role of education. *International Journal of Management, Knowledge and Learning, 4*(2), 241-255.

Koutníková, M. (2017). The application of ecomics in science education. *Acta Educationis Generalis, 7*(3), 88-98. https://doi.org/10.1515/atd-2017-0026

Krechovská, M. (2015). Financial literacy as a path to sustainability. *Trendy v podnikaní. 2*, 3-12.

Mareš, J. (2017). Prosocial behavior education in children. *Acta Educationis Generalis*, *7*(2), 7-16. https://doi.org/10.1515/atd-2017-0009

Ministerstvo financí České republiky. *Národní strategie finančního vzdělávání.* MF ČR, ČNB, MŠMT ČR, 2010.

Orton, L. (2007). *Financial literacy: Lessons from international experience.* Canadian Policy Research Networks. Retrieved from http://oaresource. library.carleton.ca/cprn/48647_en.pdf

Policy Research Initiative. (2004). Financial Capability and Poverty: Discussion Paper. Policy Research Initiative. Retrieved from http://en.copian.ca/ library/research/sedi/financial_capability/financial_capability.pdf

Roulet, M. (2009). Financial Literacy and Low-Income Non-Custodial Parents. Retrieved from https://opnff.net/Files/Admin/Financial%20Literacy%20 and%20Low%20Income%20Non-Custodial%20Parents.pdf

Shim, S. (2010). Financial socialization of first-year college students: The roles of parents, work, and education. *Journal of youth and adolescence, 39*(12), 1457-1470.

Sohn, S. H. (2012). Adolescents' financial literacy: The role of financial socialization agents, financial experiences, and money attitudes in shaping financial literacy among South Korean youth. *Journal of Adolescence, 35*(4), 969-980.

Van Rooij, M., Lusardi, A., & Alessie, R. (2012). Financial literacy, retirement planning and household wealth. *The Economic Journal, 122*(560), 449-478.

Vravec, J. (2004). Analýza úrovne finančnej gramotnosti a finančnej situácie obyvateľov východného Slovenska. *Finančné trhy, 4.*

Zhu, A., & Chou, K. (2018). Financial literacy among Hong Kong's Chinese Adolescents: Testing the validity of a scale and evaluating two conceptual models. *Youth & Society*. https://doi.org/10.1177/0044118X17753813