



Received: 20.02.2019
Received in revised form: 25.04.2019
Accepted: 18.06.2019

Doğan, Z., & Doğan, M. F. (2019). Expectations of pre-service primary teachers towards a book about teaching of mathematics on primary education. *International Online Journal of Education and Teaching (IOJET)*, 6(3), 487-498. <http://iojet.org/index.php/IOJET/article/view/615>

EXPECTATIONS OF PRE-SERVICE PRIMARY TEACHERS TOWARDS A BOOK ABOUT TEACHING OF MATHEMATICS ON PRIMARY EDUCATION

Research Article

Zeynep Doğan 

Yıldız Technical University

zeynepyildiz.2005@hotmail.com

Muhammet Fatih Doğan 

Yıldız Technical University

mfdogan@yildiz.edu.tr

Zeynep Doğan received her MA and Ph.D. in Mathematics Education. She currently works in Yıldız Technical University Department of Primary Education.

Muhammet Fatih Doğan received his MA and Ph.D. candidate in Primary Education. He currently works in Yıldız Technical University Department of Primary Education.

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Zeynep Doğan

zeynepyildiz.2005@hotmail.com

Muhammet Fatih Doğan

mfdogan@yildiz.edu.tr

Abstract

The purpose of this research is to determine the expectation of pre-service primary teachers for teaching of mathematics book. The study was conducted with 41 pre-service teachers. The research was defined as a case study from descriptive qualitative research designs. Pre-service teachers were asked about the qualities they thought of a book of teaching of mathematics to be prepared for primary school 1th-4th grades should have, and a text expressing their thoughts was made them write. The collected data were analyzed by the content analysis method. According to the results, pre-service teachers expect that teaching of mathematics book meets the needs both during their undergraduate education and throughout their teaching life. They stated that the language of the book should be removed as far as possible from the academic language. Also, regarding the mathematical content of the book, it is stated that the practices must be rich in terms of activities, instead of complicated mathematical notations, there should be expressions that can be easily understood, the clearest explanation of mathematical concepts should be included in the book. They also pointed out the book including what might be the misconceptions about mathematical concepts or what might be the misconceptions about the topic would be useful for them in the point of what they should pay attention to when teaching them. They also stated that there should be a lot of material samples for teaching each subject about mathematical content.

Keywords: pre-service primary teachers, teaching of mathematics book, expectation

1. Introduction

The course book is a printed teaching material prepared in accordance with the objectives, content, learning-teaching process and measurement and evaluation dimensions in the curriculum and used for learning purposes (Demirel & Kiroglu, 2005). Course books are a basic tool for studying and explaining the information of the subjects in the curriculum in a planned and regular manner and as a source of information to guide and educate the student in the direction of the course objectives (Unsal & Gunes, 2004). The oldest and most common learning technologies used in education are based on written materials. Among them, course books with a special position are an integral part of the "book-teacher-board" trio, which is called a magical triangle in education. A well-prepared course book provides great benefits to both teachers and students and guides teachers and students in educational and learning activities. In this sense, the course books have a separate place in the lives of

both teachers and students (Rowntree, 1992; Sahin, 2010). Course books are the basic tools that are used in the course play a role in developing the course in process and in expanding on practices and knowledge, life orientation.

They are products with a high level of labor and functional value in terms of the continuous supervisory nature of their preparation and organization and experiencing many periods in the process of maturation and development, rigorous and careful work-related qualities (Guclu, Toppes, Yel, Korkmaz, Çakmak, Koksall & Albayrak, 2001).

Although there are many technological materials that replace the textbook, a qualified textbook is a guiding course material. For this reason, researches should be made possible to increase the quality of textbooks and these researches should be increased (Bircan, 2018). Educational experts view course books as the best source and primary material in delivering information to students (Gokkaya, 2003, 11). Research shows that even the expert teachers in a field do not have as much knowledge and material as the textbooks in the field. In this respect, textbooks are important for providing students with satisfactory access to the basic knowledge they need in their learning process (Ellis, 2015). Course books allow teachers to use their power better in teaching (Kaptan, 1999). Also, course books have a significant effect on decisions about in-class learning-teaching activities as well as having an ability to be a resource that determines what students will learn and what teachers will teach during teaching. For this reason, it is possible to say that course books are the most used teaching tool to guide the learning experiences of students in order to realize their educational aims (Epcacan & Okcu, 2010). The researches carried out with various traditional and modern tools suggested for use in the classroom show that the place of the book in the classroom is very important nowadays and teachers begin with a book and proceed with the book in many activities (Ceyhan & Yigit, 2004, 18). According to researches, it was determined that 70% and more of the course books were utilized as educational material and the students spent about three-quarters of the time with activities related course books in the classroom (Karamustafaoglu, Yaman & Karamustafaoglu, 2005). There is no doubt that books are very useful materials when viewed from the perspective of the students. Thanks to the book, the student will have the opportunity to review the teacher's talks and other information whenever he wants, where he wants to, and at what speed he wants for a number of times, and to study independently (Kucukahmet, 2000; Ataman et al., 2001). Referring to other developed or developing countries as well as in Turkey, course books are an important educational tool and is always the main source of information (Kaya, 2002; Tertemiz, Ercan & Kayabasi, 2004; Demirel & Kiroglu, 2005). The main purpose of preparing the textbooks is; books contain the activities that will give the students the cognitive, emotional and psychomotor behaviors determined in the curriculum and they are the guiding qualities of these activities (Kanli & Yagbasan, 2004; Unsal & Gunes, 2003). The use of course books as one of the most important resources in teaching requires carrying out various functions. Access to knowledge, ability to group and associate information in a logical whole within the mind, to create a basis for self-learning, to contribute to the permanence of correct behaviors, and to personality development can be counted among these functions (TUGIAD, 1993; Demir, Maskan, Cevik & Baran, 2009). At the beginning of the subject or unit in the course books, to draw the attention and the interest of the students to those subjects, to prepare them to make them willingly, to present the learning experiences in the stage of acquiring targeted behaviors while unit subjects are being processed and the opportunities of observations, experiments and researches and reaching certain results on their own for the purpose of providing control and reinforcement at the end of the unit should be given to students (Altun, Arslan & Yazgan, 2004; Kaptan,1999). The fact that the course books to be prepared are based on structurally active curriculums and that they are prepared by taking into

consideration the needs of the individual and the society, the proposed activities are compatible with the theory, the center of the teaching is equipped with activities taking place individually, the establishment of interdisciplinary relations in the activities will contribute to making the book more functional (Epcacan & Okcu, 2010).

From past to present, the issue of course books in Turkey has continued to be relevant. Questions such as how course books should be, what is the place and the importance of it in teaching and how to choose? are addressed in National Education Committees, party, and government programs and progress plans (Kilic, 2005). However, it is seen that the course books are not often included in the studies that reflect the viewpoint of the students about the contents of the course books in the literature.

There are many courses taught in different disciplines in Primary School Teacher Education undergraduate programs of Faculty of Education. Among these courses, there are Teaching of Mathematics I and II courses aimed at improving the knowledge and skills that would benefit pre-service primary teachers in teaching of mathematics studies for primary school students in their teaching experience. There are several course books in our country written for Teaching of Mathematics courses. Nevertheless, when the literature was searched, there was no study about the expectation for teaching of mathematics book that pre-service primary teachers could use in Teaching of Mathematics I and II. In this respect, the aim of this study is to determine the expectations of the pre-service primary teachers from teaching of mathematics book. This work was also conducted as a preliminary study of the process of building the content of teaching of mathematics book that is planned to be developed at the primary school level.

2. Method

2.1. Research Design

The case study of qualitative research designs was used. According to Stake (1995) and Yin (2009, 2012), a case study is a research design in which researchers analyze a particular situation, often a program, event, action, process, one or more individuals in depth (as cited in Patton, 2014). In this study, a case study is determined by the reason of examining the pre-service primary teachers' expectations for primary teaching of the mathematics course book and of trying to get more details related to the issue from pre-service primary teachers as much as possible during this process.

2.2. Participants

The study was conducted with 41 pre-service teachers studying at a state university in Istanbul, sophomores in the department of primary school teaching. The reason for conducting the study with sophomores in the undergraduate program of primary school teaching is that these students have not yet taken the courses of Mathematics I and II in the curriculum of undergraduate programs. In this respect, it was aimed to determine the most natural state of their own thinking, thinking that they had not been able to examine in detail the contents of any teaching of mathematics book until now.

2.3. Data Collection Tool and Application

Pre-service teachers were asked about the qualities they thought of a book of teaching of mathematics to be prepared for primary school grades from 1th to 4th should have and made them write their thoughts related to the topics. In the process of writing this text, pre-service teachers were given 30 minutes. It is stated that it is not necessary to write their names on the papers and the collected data will be kept in accordance with the confidentiality principle.

2.4. Analysis of Data

The texts in which the pre-service teachers express their thoughts were read in detail and analyzed by content analysis method. Content analysis is a scientific approach that enables to examine verbal, written and other materials in an objective and systematic way (Tavsancil & Aslan, 2001). The main goal of content analysis is to reach concepts and associations that can explain the collected data (Yildirim & Simsek, 2008). In this direction, the data collected in this research were arranged in accordance with the emerging concepts and the themes were formed.

3. Findings

When the answers given by pre-service teachers were analyzed, it was seen that a wide variety of expressions were used in relation to the characteristics of the book. By analyzing the content, the expected features of the book are covered under the general heading, general purpose and mathematical content.

3.1. Findings about the general appearance of the book

Pre-service teachers expressed their thoughts about the writings, images and physical status subheadings of the book under this heading (Table 1).

Table 1. Subheadings of the heading "General view of the book"

Heading	Subheadings
General view of the book	Text in the book
	Visuals in the book
	Physical State of the book

Pre-service teachers indicated that text in the book is an important circumstance for them to be as far as possible from the intensive academic. It was stated that the language should be a simple language. It is emphasized that the simplicity of the language is important in terms of understanding more easily. Besides, it is stated that it is a negative situation if the texts are intertwined or in a complex structure.

Regarding the visuals, they stated that it would be more beneficial for them to have as many visuals as possible. However, it is stated that the visuals contained in the book should be created in such a way that primary school students can easily understand and recognize them. Thus, the visuals should be suitable for children's levels. It is stated that the benefits taken from the book will increase more in case the drawings are more obvious and quality. Besides, it is stated that the presence of more visuals in the book will increase the quality of the book.

For the physical condition of the book, it is stated that the use of quality paper and the materials used should have a longer life. They stated that it would be more appropriate for them to have a small number of pages. Similarly, it is considered that the book is composed of modules will increase its usefulness. They have stated that it is important of the text and visuals in the book are suitable for design, free of complexity and should be simplified and suitable for the age of the students. In addition to these, it is stated that the physical condition of the book should not be monotonous and interesting content and formats should be used in order not to be boring.

3.2. General objectives of the book

Pre-service teachers expressed their thoughts under this heading for contribution to mathematics learning, positive attitude development, supported theory, personality effect and usage subheadings (Table 2).

Table 2. *Subheadings of the heading "General objectives of the book"*

Heading	Subheadings
General objectives of the book	Contribution to learning mathematics
	Positive attitude development
	Theory-based
	Influence on personality
	The use

It is stated that one of the most important features of the book is to provide information on how to teach mathematics to primary school students more easily. Because, teachers have theoretical knowledge about the subjects in the curriculum, but they stated that they have not got enough knowledge of how to teach students by lowering it to the primary school level. Another feature expected is that the books extend of a description of how to teach the subjects within the scope of values education. Because the values that need to be given have been specified, however, when mathematics lesson is an issue, they stated that they have a lack of resources on how to deal with these mathematical topics. One of the biggest problems of education in the countries is the lack of mathematics education. Therefore, it is expected that teaching of mathematics book will become a guideline for pre-service teachers and teachers to deal with these problems. Yet another expectation is that the book needs to be found in concrete directions on how mathematics can be conveyed in the most accurate and appropriate way. The book is among the most expressed expectations that the pre-service teachers or teachers who use the book should contribute to being better equipped.

It is considered that one of the most important negativities related to mathematics lesson is the negative attitude towards mathematics. T10 coded pre-service teacher stated his view of the issue as 'First of all, most people are afraid of mathematics and fail in mathematics. In my opinion, this is because of the methods of teaching the course and the boredom of resources. Resources should be fun. As the classes we teach are 1 to 4th grades, resources should be educational and entertaining. Because children in these grades are still in play age. The books should be colorful and must draw attention'. Accordingly, pre-service teachers stated that books require to touch on this situation and to have content that enables students to develop a positive attitude towards mathematics. In connection with this, the fact that the book is fun is thought to be an effective factor. Thus, the book should contribute to love mathematics. At the same time, it should be a well-prepared book that can help to break the prejudices about mathematics. It is stated to be important that the book should have content helping mathematics teachers to motivate their students.

Pre-service teachers have different opinions about the theories that the book should be based on. Some of the pre-service teachers addressed that book requires to be designed based on the constructivist teaching theory and to guide students in order to save them from memorizing. It is stated that the content should not be in a way that formula is given and then the answer is requested to be solved. It is emphasized that the book must have permanent

learning and content to enable students to participate actively in the education process. The expressions of the T3 coded pre-service teacher in this regard are that 'Books, activities, practice can be predominant. The application is more effective than the theoretical as we learn the information based on how we will teach. Students will have trouble listening to the course only theoretically. Because they are loaded with energy.' Some pre-service teachers stated that the contents of the book should be shaped in accordance with the 5E model, which includes steps such as introduction, exploration, explanation, deepening, and evaluation. Another opinion on this issue is that the differences in individual learning should be taken into account. It is stated that the book should contain different content for individual differences as much as possible and that teachers should be able to find different activities for different types of students from the book. Some pre-service teachers who think that the contents of the book have a duty to influence the students' personalities also stated that the book should contain parts that will improve the students' intelligence and creativity. At the same time, there should be Information about how math teaching can be carried out in a way that opens the horizon for students. Teachers should guide pre-service teachers and teachers on these issues. When the opinions on the use of the book are examined, it is seen that the book should not restrict the teacher. T7 coded pre-service teacher in this regard stated that "I'm not in favor of the book's teacher restriction. I'm in favor of the teachers showing his talents." In addition, it is expected that the book will provide benefits to pre-service teachers in both student and teacher's lives. In this case, T2-coded pre-service teacher said, "the book we will use should be such a book that I would like to use it even when I'm teaching it, in other words, when I'm teaching it in the future." In addition, the book should be interactive, both in writing and practical use should be among the expectations. In this regard the statements of the T3 coded pre-service teacher, "The book must be interactive because we cannot understand anything just by reading it. Even if we understand, it will not be permanent."

3.3. Mathematical content

Pre-service teachers expressed their thoughts under this heading on the topics such as subject expression, teaching methods, activities, material examples, sample questions, interesting contents, evaluation, attitude, stress, useful information (Table 3).

Table 3. Subheadings of the heading "General objectives of the book"

Heading	Subheadings
Mathematical content	Teaching
	Activities
	Teaching Methods
	Material Samples
	Sample questions and evaluation
	Interesting contents
	Attitude
	Points
	Useful information

It is stated that the book should include both the theoretical content and information on how to provide the content. It is believed that it is important to specify how these topics are described, the boundaries of the content of the subject at the primary school level, and how it should be taught. The T5-coded pre-service teacher states that "Mathematics is often a course that contains abstract topics, and because it is difficult for the pupils to learn, there must be methods to help the teachers to express these matters in concrete terms in the primary school teaching of mathematics book. I think that the content of the book should be more "How can the mathematics be explained in concrete terms?" However, it is necessary to emphasize the subjects that are the continuation of each other, that is, to include prerequisite learning. In relation to the teaching part, it is seen that another important situation is to have the content that is appropriate to the level of primary school. Similarly, a wide variety of teaching methods are expected to be mentioned in relation to teaching subjects.

When the expectations for the qualifications of the activities to be included in the book are examined, it is stated that these activities are related to how to teach the subjects and there has to a lot of activity samples. While it is stated that there should be plenty of activities, it is also meant that there should be a wide variety of activities. They also consider it important to have detailed explanations on how these activities can be performed, what tools can be used, and even where some materials can be supplied. Pre-service teachers stated that the use of materials in the teaching of mathematics process is very important, and they also stated that there must be many and varied examples of materials in the book. In addition to material examples, they also stated that there should be information on how these materials can be used in the most effective and correct forms in the lessons. In this regard, the views of the pre-service teacher T38 code stated, "I think it should be the activities and materials that we can apply both in our university life and in our teaching life. I think these events should be explained in detail. I think it's important to have a book that can be used again and again. " They think that mathematics courses should be given as much as in the book, with sample questions and practice. They stated that it would be more useful to create these examples and exercises using visuals in a way that appeals to children. At the same time, it is stated that it is necessary to have information about how the solutions to the questions in the book should be explained to the students. They also stated that the fact that these examples and exercises were constructed and arranged according to various levels of difficulty would increase the usefulness of the book. As part of the evaluation process, it is stated that what kind of homework and study leaves can be given on the basis of the subjects/gains should be explained and exemplified.

Pre-service teachers who think that students' interests should be taken into consideration to be effective in teaching mathematics, find it important that the book has interesting content in general. In this respect, they stated that one of the steps of the lesson plan should include examples of how to make the "drawing attention" step on the subject.

In this respect, they stated that there should be examples of how the "draw attention" step, which is one of the steps of the course plan, can be realized on the basis of the subjects. Similarly, having the contents that teaching while entertaining such as educational games, level games, game-like applications, puzzle-joke and having the contents entertaining while teaching such as interesting funny stories, photos, maps, schemas, concepts maps, graphics will be useful for this purpose. In addition to this, T39 coded pre-service teacher also points out to give place toys in teaching of mathematics process and this might be beneficial for her own opinion with these sentences: 'Teaching some of the subjects of Mathematics with the help of various toys will attract the attention of the students. For example, teaching fractions with legos, etc.'

In addition to the attitudes and expectations expressed in the title of the book's general objectives, pre-service teachers stated that mathematical content also should be created in a way that positively affects the students' attitude. In mathematics classes, they stated that there should be content to answer questions about how to love mathematics, how to pass the fear of Mathematics, and how to make mathematics more enjoyable. T16 coded pre-service teacher reflected his opinions in this way: "The easier we teach and make students love mathematics the easier we provide the fact of mathematics in their minds. Mathematics was my only fear as it was everyone else, and this was due to my inability to understand and love mathematics in primary school years. It should help us understand how to make the math easier for the child. They should have information about what level of mathematics will be taught and what to look for when starting." For the same purpose, they also think that it would be useful to have contact with children in primary school by referring to the physical, emotional and psychological development of primary school students in terms of age groups at the introduction of the book. The statements of the pre-service teacher with the code T4 are that: "At the introduction of the book, the age group we are responsible for is physically, psychologically, etc. should be mentioned. How we will treat them ... " Some pre-service teachers indicated that the book should contain certain emphasizes. It is worthwhile to emphasize the points about the teaching of subjects, what are the points to be taken into consideration when teaching them, what are the possible mistakes in teaching or learning them, what are the misconceptions that may arise during the teaching of the topics and which are more important in the teaching process. In this regard, the T22-coded pre-service teacher's statements are as follows: "there can be information about what kind of way I can follow as I begin to explain a topic. What else should I pay attention when explaining a topic, what mistakes I can make, and what they should give information about."

It is stated that it may be useful to include some unusual sections in the classical academic book content. For example, it is stated that examples, shapes, visuals from everyday life should be found in relation to mathematical subjects or concepts. For pre-service teachers or teachers to reach resources that may be useful to them should be indicated, and they think that there should be suggestions for more resources. In addition, they stated that it would be useful to include diary-memories containing positive or negative experiences of teachers in teaching of mathematics processes.

4. Discussion and Suggestions

In a study conducted by Findley in 1979 on which qualities the students were more successful, the students reported that the course materials prepared in consideration of individual interests and needs during preparation process make their understanding easier and influence deterministically (as cited in Yalcin, 1994). When the expectations of teaching of mathematics book that could be used for the primary school level were asked, it appears that the answers of the pre-service teachers are based on the negative attitude towards mathematics in general. In fact, while some pre-service teachers expressed their views on this issue, they expressed their views on the negative experiences of teaching of mathematics in their own student life. Eliminating the negative attitudes of students towards mathematics if any, in addition to this, contributing to developing a positive attitude of students, drawing the attention of children and providing opportunities for children to learn while having fun are the biggest and most important duties of the book at issue are pointed out. The pre-service teachers do not want their students experience the same negativities related to mathematics which pre-service teachers experienced before in their years of study. They stated to hope that a book of teaching of mathematics could be provided with the qualifications they mentioned.

The language and statement feature of the book is also very important for the learners to use the textbook effectively and efficiently (Tas, 2007). Almost all pre-service teachers stated that the language of the book should be as simple and easy as possible to understand. Particularly, it is understood from the expressions used in this issue that pre-service teachers do not find books with academic language useful. They think that these books are not very helpful for them. Because they think that when they become teachers, their real needs will be concrete activities and material examples about how to conceptualize subjects well and concepts in the course. Tertemiz and the others (2001) emphasize that the language to be used in course books is necessary to be simple, fluent in text, understandable, short and core Turkish consisting of the concepts which students know and use, and that it is important to use language and statements appropriate to the levels of students in consideration of their learning and development stages. Similarly, Çotuksoken (2018) stated that correct and clean Turkish should be used in books. In addition, he emphasized the need to pay attention to the use of a correct, clear, simple language and narration in the application of the subjects in the book.

Pre-service teachers expect the teaching of mathematics book to meet their needs both during their undergraduate education and throughout their teaching lives. They stated that the language of the book should be removed as far as possible from the academic language, and it is necessary to use a language which can be understood more easily. Regarding the mathematical content of the book, they addressed that the book needs to be rich in terms of practices and activities, to include statements which can be easily understood instead of complex mathematical notations and to involve the clearest explanation of mathematical concepts should be included in the book. The major shortcomings of pre-service teachers at the point of teaching of mathematics are that they do not know how to teach conceptual errors and the theoretical knowledge they receive in accordance with the level of primary school students. For this reason, pre-service teachers stated that both theoretical and practical content should be found in the book. In particular, with regard to practical content, they stated that by giving place to all kinds of details in the book, it is necessary not to remain question marks in the mind of the pre-service teacher about how to teach the basic concepts about the subjects. In this respect, Baloglu (1994) states that printed materials should teach students how to create information instead of transferring mold information for them, and that they should be prepared in such a way as to be able to conduct collaborative work, oral and written communication, as well as to understand basic concepts, to interpret and apply them.

They pointed out that if the book also includes what might be misconceptions or possible learning errors about mathematics, it will be useful for them to what they would pay attention when teaching them. Because those who read books in this way will benefit from the experiences of teachers who were gained in many years or in different settings and practices. They also stated that there should be a need to include a lot of material samples for teaching each subject about mathematical content. This is because primary school students who are in the process of concrete transactions think that learning by using the concepts of materials will lead to more permanent learning. At the same time, they think that the material plays an important role in points such as attracting students and raising their curiosity. For this reason, they have stated that it is important to find materials in a wide variety of subjects as subject-based included in the book. It has been stated that explanations about how to use these materials in the most effective manner should definitely be included.

Regarding the visuals in the book, they stated that it would be more useful to have as many visuals as possible and drawings for primary school children. In general, they pointed out that the whole content of the mathematics book prepared to relate to everyday life and to

be loved mathematics by all children would be useful for both themselves and for the students. Dogan and Dogan (2018) stated that in the research they conducted with pre-service teachers, how to teach the subjects and concepts should be used in a simple language with plenty of suitable visual content in the book content. Besides, in the study carried out in Ors and Simsek (2018), the brightness of the images in the book, their vividness, their attention to the focus of photography, their appeal, the quality of the visuals, the diversity of the visuals, the use of the visuals as a whole, the relationship between the visuals and daily life are considered to be very important in attracting students to the book.

Ozil and Tapan (1991) in their research on course books which are the basic material of teaching process, regarding of the majority of course books in Turkey deduce that they are lack of content integrity in subjects and they are arranged not to take in consideration of students' developmental features; they have failed to contribute to the critical thinking skills' development due to the lack of examples of reflecting different perspectives on the subject and the inadequacy of books in terms of form and design led to students' negative attitudes which have affected the students' success negatively. As a result of this study, when the findings obtained from this study are evaluated, it is concluded that pre-service primary teachers need a resource book about teaching of mathematics prepared in accordance with the expectations of the pre-service teachers, which will contribute for them both during their undergraduate education and in their teaching experiences. It matters the book that is needed to be prepared as the printed materials mentioned in the literature by taking into consideration the general characteristics that should be carried and by evaluating the views of academicians, teachers and other educational experts who are other potential beneficiaries of the book together with the expectations of the pre-service teachers of this book.

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