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ASSESSING UNIVERSITY STUDENTS' COMPETENCES FOR DIDACTIC PLANNING IN MATHEMATICS AND ENVIRONMENTAL EXPLORATION IN THE CONTEXT OF EDUCATIONAL SYSTEM CHANGES IN ROMANIA

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Abstract

The study stemmed from the fact that teachers have difficulties in designing lessons. The objective of the study was to identify these difficulties and to analyse how to adapt lesson plans in the context of the paradigm shift in the educational system through its focus on competence training. We analysed 40 lesson plans for themes at the subject "Mathematics and Environmental Exploration" for the preparatory class. These lesson plans were developed by third-year university students who were teachers and educators that completed full time courses and distance learning at the specialization "The Pedagogy of the Primary and Preschool Education", during the 2014-2015 academic year. We analysed the titles of the plans, the introductory part of the plans (class, grade level and date, subject, curriculum area, thematic units, the lesson type, the specific competences, the operational objectives, the organization of work, methods and processes of teaching, means of education), and lesson development. We identified the problems that teachers had in designing the lesson and we made some suggestions for solving them.

Keywords: *preparatory class, competences, lesson plan, pre-university education, higher education, initial training*

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INTRODUCTION

Since 2012, in the primary school system in Romania, there has been a paradigm shift in organising the educational system and designing curricular documents (Dulamă and Magdaş, 2014, p. 11). OMECTS no. 3654 of 29.03.2012 approved the curriculum for primary education, basic procurement cycle – preparatory class, first grade and second grade (www.edums.ro/Legislatieinv%20primar%20pl%20cadru.pdf). According to this curriculum, starting with the 2012-2013 school year, the preparatory class was introduced in the education system in Romania (Dulamă and Magdaş, 2014, p. 12) and renounced the preparatory group organised in kindergartens. If in the previous curriculum, along with other subjects, there were "Mathematics" and "Environmental Education", in the new curriculum, in the curricular area "Mathematics and Natural Sciences", the discipline "Mathematics and Environmental Exploration" was introduced. In the 3rd and 4th grades, these subjects were studied separately. Regarding the number of hours in the curriculum (the syllabus for the subject "Mathematics and Environmental Exploration" approved by the Ministry of Education in Romania, no. 3418/19.03.2013), the preparatory class and the 1st grade were allotted 4 hours per week and the 2nd grade 5 hours per week. Magdaş and Dulamă state that "to the preparatory class, within 3 hours, great priority is given to math contents and, in an hour, to those related to environmental exploration" (Dulamă and Magdaş, 2014, p. 12).

To design and organise their work according to new official documents, the teachers who taught preparatory classes attended training courses, such as the "Interdisciplinary organisation of the learning offers for pupils in the primary grades for acquiring key competences" – program, offering blended learning training for teachers in primary schools (POSDRU/87/1.3/S/63113).

Even before these changes, researchers discovered that there had been difficulties in designing lessons and errors in formulating operational objectives, questions, answers, tasks, detailing the training, in explaining phenomena and processes, in mentioning the ways of assessment (Dulamă, 2009). Stan (2014) noticed the large expansion of some lesson plans and the fact that the limited resources did not allow for their application entirely.

Starting from these premises, we asked ourselves what difficulties the teachers had in designing the current school class curriculum and how they managed to adapt the lesson plans to the new official documents. To find answers to those questions, we analysed lesson plans realised by university students.

MATERIAL AND METHOD

The aim of this study was to analyse 40 lesson plans at the subject "Mathematics and Environmental Exploration" for the preparatory class.

Those lesson plans were developed by 3rd year university students – teachers and educators who completed full time courses and distance learning at the specialization "The Pedagogy of the Primary and Preschool Education", during the 2014-2015 academic year. The plans were assessed at the course "Geography. Teaching Methods and Practices in Early Childhood and Primary Education". The students were not required to carry out the lesson plan after a certain model and that allowed them to choose the subject and the structure. It was recommended that the plans be completed on the computer and be original. The students had the opportunity to present a plan developed and applied during their teaching practice.

RESULTS AND DISCUSSIONS

1) The title of the lesson plans

Figure 1 shows that 47.50% of the plans were called teaching plans, 32.50% were called integrated activity plans, 17.50% were called lesson plans, and one (2.50%) was named integrated activity plan. In the literature of the field, they termed these plans lesson plans or teaching activity plans (Bocoş *et al.*, 2009, p. 93; Bocoş, 2013, p. 153), and teaching plans (Stan, 2014, p. 223). We considered that the name lesson plan (Dulamă, 2010, 2013) was the most appropriate because it explicitly indicated the type of activity according to the following definition: "From an organisational perspective, the lesson is a form of activity that takes place in the classroom, under a teacher's supervision, in a specified time period (usually 50 minutes), based on the requirements of the curriculum and according to the timetable" (Ionescu, 2009, p. 308).

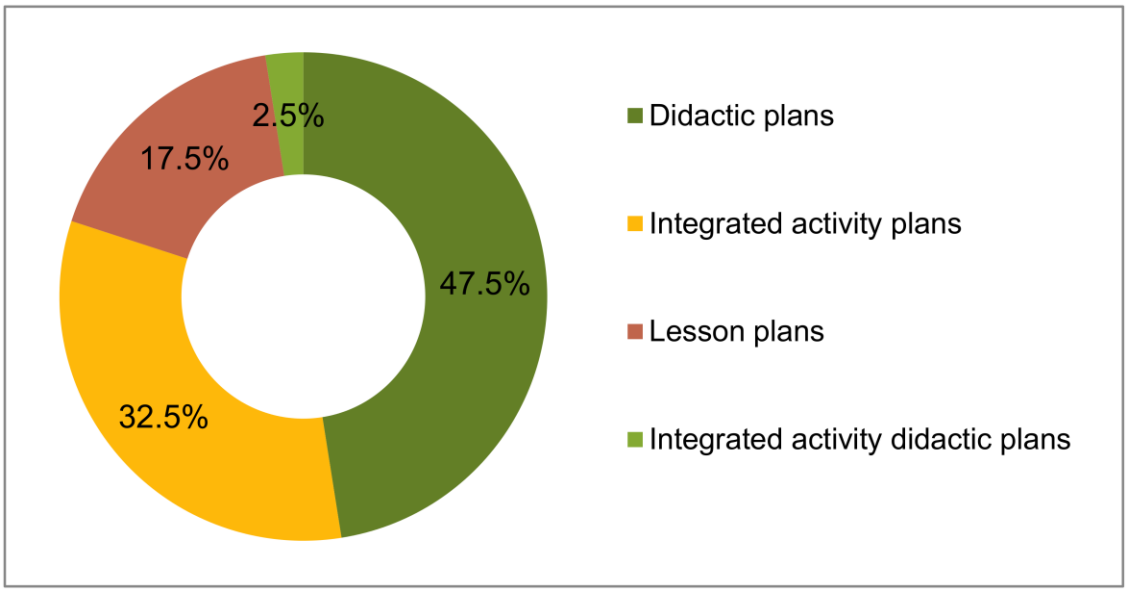

Fig. 1. The title of the analysed plans

The term teaching plan or teaching activity could be attributed to other activities with an educational purpose (e.g. visit, trip, activity in the students' study club). In the context of the paradigm shift in the design of curriculum documents, in school practice, perhaps from the desire of scientific rigour, the name lesson plan was replaced with integrated activity plan or teaching activity. The fact that a plan had in its title phrase *integrated activity* was not a guarantee that the work was integrated. Also being called a lesson plan, the lesson did not mean it was not structured on the principles of integration. To avoid confusion, we suggested that the name of integrated activity plan be attributed only to plans whose activities lasted more than 50 minutes (four hours a day, a week, etc.), provided that the activities should have been integrated in an authentic way and the name of lesson plan was used for activities that had the attributes of the lesson, including the duration of 50 minutes.

2) The header

Bocoş stated that this introductory component of the plan contained "information from which the coordinates of the plan were derived: date, class, grade level, the subject of education, the subject of the lesson, the fundamental objective, class lesson, lesson type, operational objectives (O1, O2, O3), the teaching strategy (type of learning experience, methodological system, means of education system, form/forms of organising students` work)" (Bocoş, 2013, p. 153). That author pointed out that "optionally, the aims of education might be recorded from the curriculum, which were subordinate to the operational objectives within the lesson/teaching activities or that could be only recorded numbers/symbols of those aims" (Bocoş, 2013, p. 153). Stan suggested that this introductory component of the teaching plan should have included: subject, grade, the learning capabilities of the students` level, topic, type of lesson, overall goals/objectives framework/reference objectives, operational objectives (listed in order of importance or in the sequence they appeared in the lesson, that they were numbered from 1 to n: O1, O2, ... On), teaching strategy (methods and procedures, teaching aids, organisation of students` work, time), and references. We analysed the introductory component of the plans (Stan, 2014, p. 224).

Class, grade level and date

Figure 2 showed that in the 40 plans, the class was mentioned, whereas in 23 plans the date was mentioned. In none of the plans, the grade level was specified, which proved that, in practice, this detail was understood as being primary education.

The curricular area

In 33 plans, they stated correctly the name of the curricular area "Mathematics and Natural Sciences", in five plans the name was missing, in two plans it was wrongly written. Although the authors of the plans chose to write the name of the curricular area in the header, the specialty literature

did not recommend this (Bocoş, 2009, 2013, 2014; Stan, 2014) and neither do we consider this as being necessary.

The discipline

In 32 plans, instead of the phrase *educational object*, they used the term *discipline* followed by the name *Mathematics and Environmental Exploration* (MEE) and in two plans the former name of mathematics was included. In six plans other names of disciplines were misused (MEE and VA/PS[1] – one case; MEE, CR[2], VA/PS, PD[3]- 3 cases) or integrated disciplines (MEE and VA/PS - a case; CR and MEE – one case) probably, because of the erroneous belief that by mentioning the name of the subjects from which were integrated certain contents that would ensure a greater rigour in design. We emphasized that in the education plan, in students' timetable and in the attendance register of the school it was mentioned the name of the discipline *Mathematics and Environmental Exploration*, no other names.

The thematic unit

In 36 plans, the thematic unit was mentioned, even if in the specialty literature that recommendation was missing. We noticed that the thematic unit had similar characteristics with the learning unit: it was thematically consistent; it had an open and flexible didactic structure; it was conducted continuously over a period of time (Bocoş, 2013; Dulamă, 2011, p. 16); it was a logical division of a content that was to be acquired, with all that content related skills; it comprised several subunits, through which an acquisition of some articulated grouping of knowledge, of behaviour, of a skill, of learning a skill was made (Bernat, 2003). The thematic unit differed from the learning unit by consistency with some specific skills instead of reference objectives, by including learning activities instead of lessons and by the fact that it did not end with cumulative assessment. Table 1 shows that 11 thematic units had names that indicated the approach of some contents related to the environment. We noticed primary teachers' preference for seasons and for astronomy. We noticed that within six thematic units it was more difficult to integrate contents from MEE (e.g. "Childhood", "Fantasy and creation").

The topic of the lesson

In 34 plans, the term "topic of the lesson" was used (Table 1). Using the term "the theme" of the lesson in three plans was not the most appropriate word because that polysemantic term in Romanian (it meant a theme or homework) could be confusing. In three plans, the topic of the lesson was not mentioned probably because activities were integrated from different disciplines. In 15 plans, the topic was from *Mathematics*, in 21 the topic was from *Environmental science* and *Astronomy,* in four plans topics from two areas were mentioned.

[1] VA/PS – Visual Arts/Practical Skills;
[2] CR – Communication in Romanian;
[3] PD – Personal Development.

Table 1. Examples of names of thematic units and lesson titles

Name of the thematic unit	**Lesson title**
Planet Earth	World Water Day
From the Earth to the Sun	Plane geometrical figures. In the world of the Universe
Winter	Little researchers
Europe	Exercises and problems with numbers from 0 to 31
I know how to build	Mathematics with caterpillars and butterflies
Summer	The Seasons
Fantasy and creativity	Spring in the meadow
Childhood	The Time
Childhood	Units of time – the seasons
Childhood	Units of time – the week
From the Sun to the Earth	Animal world
Wild animals	Natural numbers from 0 to 10
Friendship	Wild animals (the bear and the fox)
Among stars	The planet of numbers
The Easter holiday	The addition and subtraction of natural numbers from 0-10
We love animals and we protect them	Addition and subtraction with numbers from 1/2 units from 0-10
Hello, spring!	Exercises and problems from 0 to 10
Hello, spring!	The Solar System
About jobs	Greetings from space
The planet of numbers	The planets of the Solar System. The triangle

From the analysis of the names of the lessons, we noticed that those were not always derived logically from the thematic unit (e.g. the lesson "Exercises and problems with numbers from 0-31" into the thematic unit "Europe", the lesson "Mathematics with caterpillar and butterflies" in thematic unit "I know how to build"). It is inappropriate to study, within the thematic unit "Friendship", certain animals - the bear and fox - which do not have a friendly relationship. From the titles of some lessons resulted that very extensive topics were proposed for study in 50 minutes ("Animal World", "Greetings from space", "Little researchers") from which we could not deduce what students should have studied. We noticed a tendency to formulate more appropriate titles for CR ("Spring in the meadow", "Mathematics with caterpillars and butterflies") than for MEE, a discipline which required rigour in formulating the names of the content elements.

Knowing the recommendation that in three out of the four MEE lessons per week, the contents addressed in the prevailing activity should have been a math lesson and in one they should have studied contents about environmental exploration integration, we considered that the subject of the lesson should have been made only from a scientific field. The titles of the lessons should have been the ones mentioned in the syllabus for MEE or their subtitles. We considered that teachers had difficulties in phrasing the topics of the lessons because of the initial phrasing of the content elements in the school curriculum for MEE, in the preparatory grade). Dulamă and Magdaş underlined, regarding the areas from the curriculum, that "phrasing the titles for content elements leaves great freedom to the textbooks/curriculum auxiliaries' authors and to teachers in determining the volume of information and the level of deep learning" (2014, p. 22). Those authors argued that "an author of textbooks and a teacher should be very clear what and how many concepts will be introduced to a topic, when and in what order they will be introduced, how the conceptualisation process will be realized" (2014, p. 22). Another cause of the faulty devising of the topics of the lessons was the fact that, in planning the thematic units, there was no column with the topic of the lesson, but only for learning activities in different disciplines. We considered that in planning the thematic units would have been necessary to assign a title to each activity, which lasted for an hour (50 minutes). The title should have represented the quintessential of the content studied and should have been clear for any teacher what students learnt in that lesson.

The type and variant of lesson

In 39 plans (97.50%), the phrase "lesson type" was used and not "lesson category". In the header, in one plan, the lesson type was not specified. In none of the plans, the lesson variant was specified. Ionescu said that the lesson category meant a particular way of designing and doing a lesson, determined by the main teaching objective, which was the constant factor of the lessons" (2009, p. 312). Momanu stated that "there was no single typology of lessons" (2009, pp. 479) and presented several lesson types: the mixed lesson, the communication/acquiring new knowledge lesson, the acquiring new skills and abilities lesson, the revision and systematisation lesson, the assessment lesson (Momanu, 2009, pp. 479-482). In Figure 3, we noticed that, in the analysed plans, the types of lessons were formulated in various forms, many of which were different formulations of specialty literature (Ionescu, 2009, pp. 313-314).

In the specialty literature, the following types of lessons were presented: lesson of transmitting new knowledge, lesson of acquiring knowledge, lesson of acquiring new intellectual skills and abilities, of acquiring new practical skills and abilities, lesson of consolidation, review lesson and systematization of knowledge, lesson of evaluation, lesson of creation, mixed lesson (combined, teaching-learning-assessment) (Dulamă, 2010, pp. 301-302). In the plans mentioned in the cited sources it was stated that the lesson was *of acquiring competences* (2010, p. 311), and later as lessons of developing competences (2011, p. 418, 437, 447). Considering that the education system in Romania was aimed at developing competences, the types of lessons and curricular design could be simplified and adapted to the theory of competences, thus: lessons of developing

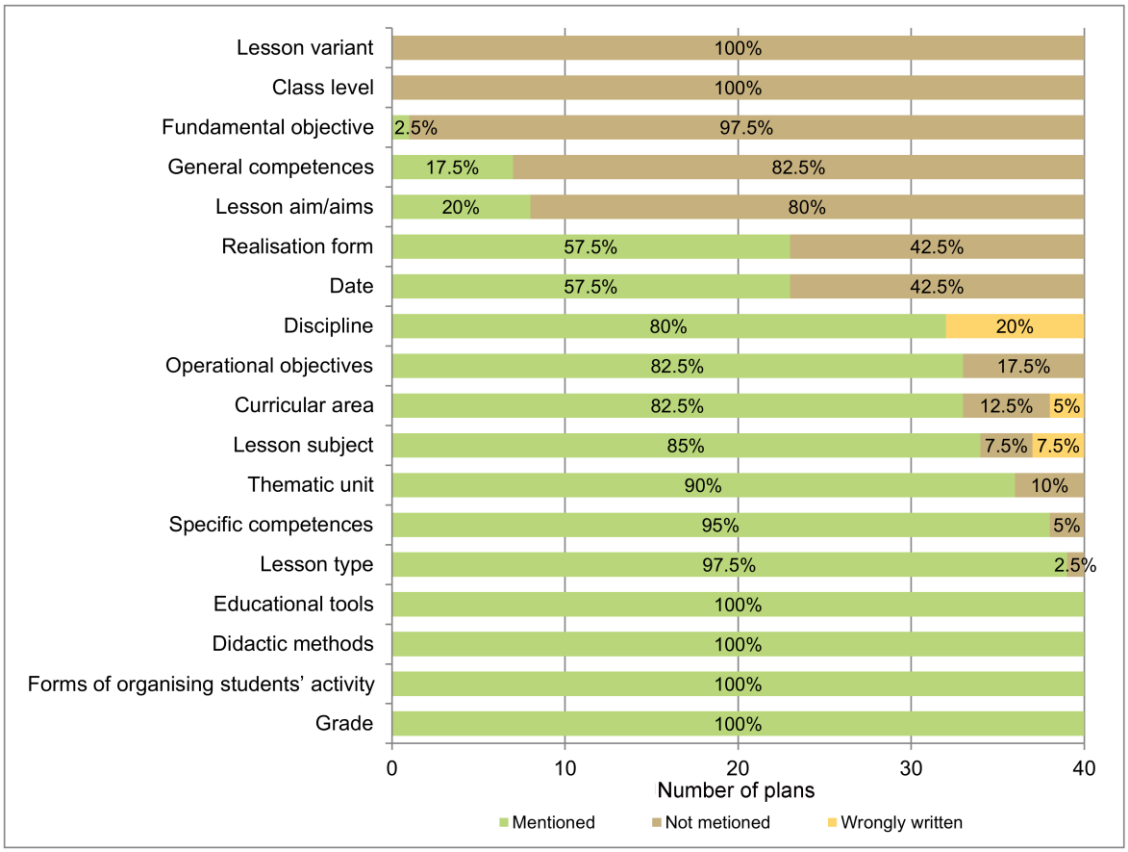

Fig. 2. Components of the header/the introductory parts of the lesson plan

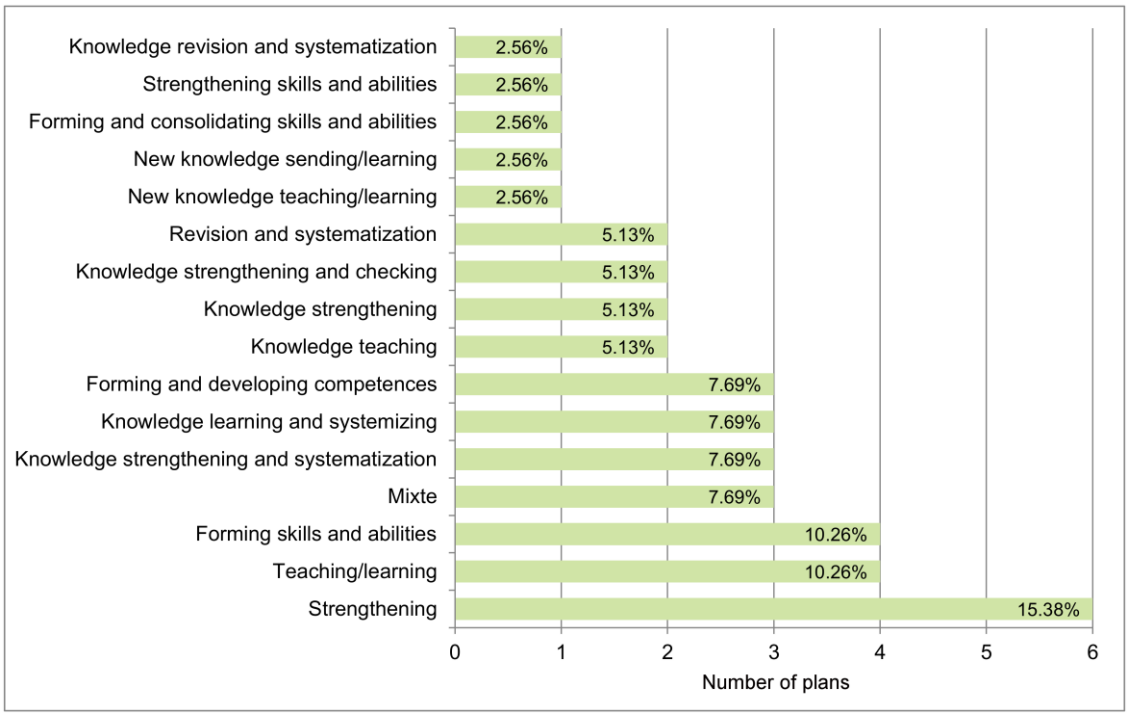

Fig. 3. Types of designed lessons

competences instead of the lessons of transmitting knowledge, of acquiring new knowledge, of developing intellectual/practical skills and abilities, lessons of creation; lessons of consolidating the competences instead of the lessons of consolidating the knowledge, revision and systematization of knowledge; lessons of assessing the competences instead of lessons of assessing the knowledge; mixed lessons/combined.

The form of achievement

In the 23 plans, the integrated lesson was specified as a form of achievement. In the specialty literature, the concept of form of achievement was not defined, but only the form of organization. The integrated lesson did not have any highlighted specific attributes to differentiate itself as a type.

The organisation forms of the students' work

Those were specified in all plans: frontally, individually, in pairs, in groups (small) or in teams. In the specialty literature (Dulamă, 2011a) it was recommended that, in order to increase the efficiency of learning, in each lesson they should have organized frontal activities, individual activities, pair work or small groups/teams, so we considered that the organization forms could be given up in the header if they complied with this recommendation.

The fundamental objective and the aim of the lesson

The fundamental objective was "the primary task or dominant of the lesson", it was similar to the purpose of the lesson and one established the lesson type according to this fundamental objective (Dulamă, 2010, p. 301) (Dulamă, 2010, p. 301). Although in the specialty literature it was recommended that the fundamental objective should have been included in the introductory part of the lesson (Bocoş, 2013) or in the overall goals/objectives framework/reference objectives (Stan, 2014), in one plan the fundamental objective was mentioned. Since the dominant task of the lesson could be drawn from the type of lesson and from its topic, we considered that the inclusion of the fundamental didactic objective in the header could be given up and the focus should have been placed on the targeted specific competences to be achieved, even if only partially, in lesson. In two plans, the aim of the lesson was included in the header, and in six plans the aims of the lesson were specified (2 aims - one case; three aims - 4 cases; 4 aims - one case). In some plans, the aims of the lessons were formulated in a general way that was why they were appropriate for any lessons (e.g. developing the skills to express themselves grammatically correct; developing the respect for norms of civilized behaviour). In one of the plans, an informative aim was included ("enhancing knowledge about wild animals"), a formative purpose ("stimulating and educating children's interest in nature") and an educational purpose ("growing interest in the environment"). In these statements, it could be noticed their ignorance of some concepts and of the relationships between them: informative, formative, educational; nature, the environment, the natural environment,

the latter being considered pleonasm. We suggested abandoning the inclusion of the goal of the lesson for the same reason as in the case of the fundamental didactic objective.

General competences and specific competences

In seven plans, there were mentioned general or fundamental competences. In the specialty literature, they did not recommend the inclusion of the general competences within the lesson plan (Bocoş, 2013; Dulamă, 2013). In 34 lesson plans, specific competences were mentioned. The total number of the targeted specific competences ranged from a maximum of 14 to a minimum of 2. In five plans, 10-14 specific competences were included, in seven plans, 7-8 specific competences, in 22 plans, 4-6 specific competences in a plan, and two specific competences (Figure 4).

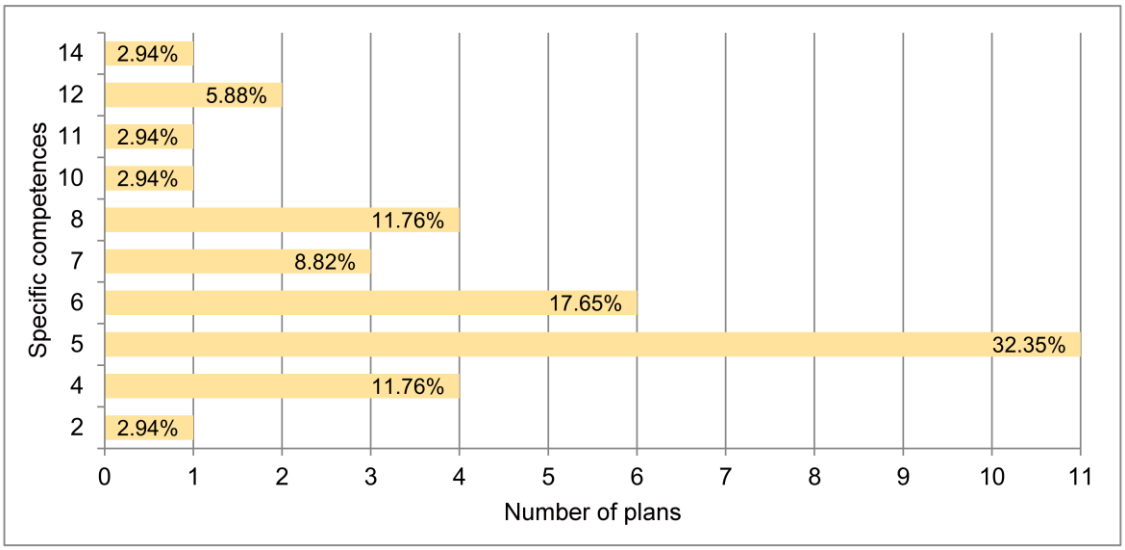

Fig. 4. The number of specific competences in lesson plans

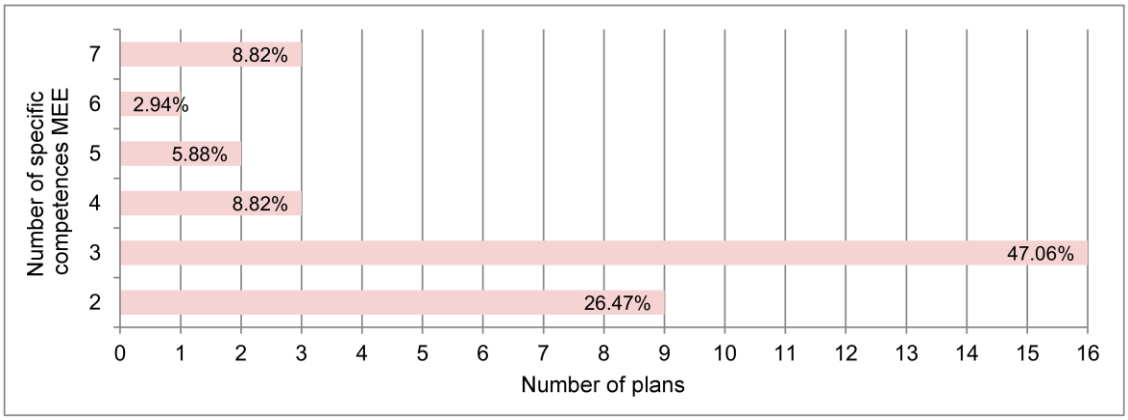

Fig. 5. The number of MEM specific competences in lesson plans

The number of the aimed MEM specific competences ranged from a maximum of 7 specific competences in three plans (8.82%) to a minimum

of 2 specific competences in nine plans (26.47%) (Figure 5). In most plans (16) (47.06%), three specific competences were included, a choice we considered realistic.

In these plans, along with MEM specific competences, there were included specific competences which belonged to other disciplines: CLR - 26 plans; AV/AP - 23 plans; MM[4] - 15 plans; DP - 11 plans (Table 2). In the specialty literature from Romania, there was no information concerning the maximum/minimum number of specific competences aimed to be formed or developed during the learning activities for the dominant discipline (MEM) and for the related activities in a lesson. In planning the thematic units, within a lesson, the teachers included 3-4 competences for the dominant activity and 2-3 competences for the related activities (http://www.didactic.ro/materiale-didactice/toamna-mandra-darnica-6).
Even if in a real lesson, more specific competences of different disciplines were developed, the learning activities should have been linked to a small number of specific competences for the dominant discipline (2-3) to increase their efficiency and to correlate them with assessment.

Operational objectives

Only in one of the 34 plans where specific competences were mentioned, operational objectives were generally lacking (Table 3), which showed that teachers operated in the learning process about the aims both with specific competences and with operational objectives. Comparing the number of the specific competences with the operational objectives, we found out that in 16 plans, the number of operational objectives was higher than the one of the specific competences, in 4 plans the number of objectives was equal to the specific competences, and in 14 plans the number was lower, which was not correct. Through a correct derivation, to each specific competence should have corresponded at least one operational objective. If the number of specific competences covered in a lesson was small, then the number of operational objectives associated to the competences could have been higher. If the number of specific competences covered in a lesson was large, then each might have been associated with only one operational objective. The tendency to aim in a lesson more specific competences and several operational objectives could result in superficial learning, and not in in-depth learning and quality.

In Figure 6, we noticed that in the 33 lesson plans, the number of operational objectives varied from a minimum of three in two plans (6.06%) to a maximum of 12 operational objectives in two plans (6.06%). The specialty literature recommended 2-3 operational objectives in a lesson (Ionescu, 2009, p. 327), recommendation followed in 6 plans. For the middle school, Dulamă (2008) recommended 4-5 operational objectives in a lesson, as it was done in 12 plans. There was a list of operational objectives in 23 plans. In 10 plans, the objectives were grouped by category (cognitive objectives, psychomotor objectives, affective attitudinal objectives). We did not refer to the psychomotor and affective attitudinal objectives because we considered that they should have not been included in the MEM lessons. In

[4] MM – Music and Movement

the specialty literature there were cognitive/informative, procedural/methodological attitudinal/behavioural objectives, which could have been adequately correlated with specific competences (Dulamă, 2010).

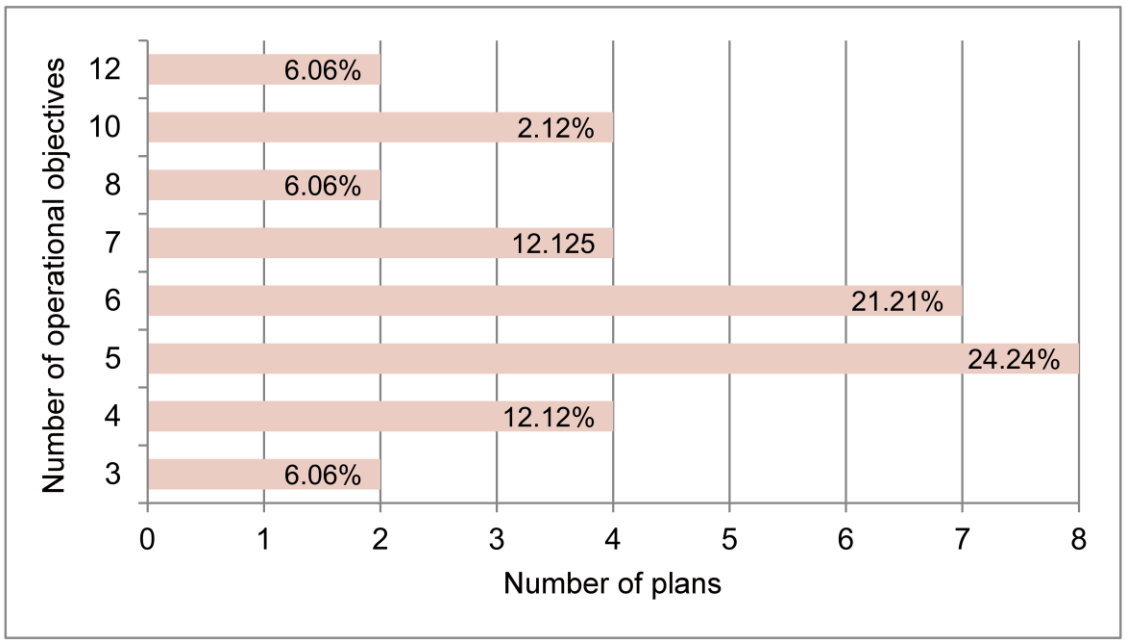

Fig. 6. The number of operational objectives in lesson plans

In formulating the operational objectives, there were some typical mistakes*: the use of two verbs of action in the statement of an objective* ("to carry out the proposed experiments and ascertain the main characteristics of the water, showing a few rules to protect the environment and to respect them"*); the use of some verbs that were not operational* (Momamu, 2009, p. 490) ("to know the role of water for human life"; "*to understand* the necessity of saving water and etermining a responsible and ecological behaviour"); the *description of some behaviour that could not be measured accurately* ("to know the water from nature in all its diversity"); *the description of some tasks and not of some objectives* ("to solve problems using addition and subtraction operations; to solve correctly the tasks from the given worksheet; to fill in correctly the summer months; to operate with mathematical terminology; to participate in short dialogues in situations of oral communication; to pay attention to a film reflecting the life cycle of butterflies; to provide clear answers to questions; to observe the components of a plant from a given picture; to observe the sinking and the floating"). Similar mistakes were highlighted by Dulamă in some lesson plans in "Science", at primary school (2009, pp. 277-280).

The teaching methods

Figure 7 showed that in 11 plans, 4-5 teaching methods were proposed to be used, in 19 plans 6-7 teaching methods, and in 10 plans 8-10 teaching methods. The most commonly used methods were: the conversation, the exercise, the explanation, the questioning, the observation, the

Table 2. The number of specific competences for different disciplines

Discipline	The number of specific competences to be formed in a lesson																																				
MEM	4	7	3	2	2	3	5	2	3	2	3	3	3	5	6	2	2	3	3	3	3	4	7	3	7	3	3	2	3	4	2	3	3	2		
CLR	3	7				2	3	3		2	2	1		1	1			1	1	1	1	1	2	1	2	1	1	2		1	1	2	1	1			
MM	1					1	2	1		1	1		3	1	1		2					1	2		1		1		1								
AV/AP			1	3		1		1	1						1			1	1	1	1	1	1	1	2	1	2	1	1	2	1	1	1	1		
DP			2			1	1	1				1			1	2						1						1					1	1		
Total	8	14	6	5	2	8	11	8	4	5	6	5	6	7	10	4	4	5	5	5	5	8	12	5	12	5	7	6	5	7	4	6	6	5		

Table 3. The number of specific competences and operational objectives within lesson plans

The number of specific competences	8	14	6	5	2	8	11	8	4	5	6	5	6	7	10	4	4	5	5	5	5	8	12	5	12	5	7	6	5	7	4	6	6	5
The number of operational objectives	8	10	5	5	4	10	12	6	6	7	3	10	7	-	12	5	4	7	7	4	3	5	5	10	6	8	6	5	6	4	5	5	6	6

Table 4. The extension of the lesson development presentation compared to the header

	Number of pages																																				
Header	2	2	2	2	2	2	3	3	1	3	1	2	3	1	2	1	4	1	3	2	3	2	2	2	4	3	2	1	3	2	2	3	2	2	1	2	2	3	1	1
Lesson development	3	9	2	1	3	4	5	3	5	3	2	4	4	3	4	3	7	2	6	2	2	1	1	3	6	9	3	3	4	5	2	2	3	3	2	3	3	4	2	3
Appendix	-	-	3			3									8	1								1		1	3	5			1			1						
Total	5	11	7	3	5	9	8	6	6	6	3	6	7	4	14	5	11	3	9	4	5	3	3	6	10	13	8	9	7	7	5	5	5	6	5	5	5	7	3	4

demonstration, and the didactic game (Figure 8). Being lessons of training and development of competences, the exercise method should have been used in each lesson. Since it was a preparatory class, the didactic game should have been used in each lesson, but it appears only in 23 plans. Being a MEM lesson, the direct or indirect observation should have been used in all lessons. The independent work was indicated in the 13 plans as a method, which was, in fact, the form of work organization. In one plan, the following methods were included: the discovery learning, the quadrants, the cube, the tour gallery, the brainstorming, the predictive reading, the explanatory reading, and the dramatization. The ICT methods and group work were included in one plan, which we considered as forms of organization. The contest, which was a form of activity, was mentioned in one plan. In some plans, the construction and artistic creation methods were mentioned, which involved, in fact, various exercises. Exemplifying was mentioned as a method in a plan, but in fact, it was a process within other methods.

In Figure 8b, we represented the use of each method out of the total number of methods (261) listed in the plans which we analysed. We noticed the great use of the conversation, of the exercise, and of the explanation.

The materials and the means of education

Those were listed in the headers of all lessons. Dulamă (2008b, p. 119) recommended that the exact name of the teaching materials which were to be used should have been specified in the header, but that recommendation was not pursued in the analysed plans. We noticed that many teaching materials were included in the analysed plans and the most commonly used were the worksheets. We noticed a predominant use of line drawings, which was detrimental to the pictures that presented aspects from reality, which would have been more suitable for the students to have a clear image about the environment.

The extension/the length of the header/introductory component

Figure 9 showed that in 9 plans the header was suitably detailed on a page and in 31 plans it was overly extended on 2-4 pages. The large extension of the introductory component was caused by: the inclusion of some information which was not necessary (e.g. school, date, curricular area, framework objectives), of writing the name of a method and of some means of education on one line, using a big size font, large spacing, the existence of some empty spaces between the lines of the text.

We considered that that introductory component should have contained only some basic information (the discipline, the grade, the topic, specific competences, operational objectives, teaching methods and means of education, bibliography) and should have been expanded to half a page. The fact that the header was spread over several pages consumed material resources, financial resources, time for development and it created difficulties for its analysis because the information was scattered. For example, it was difficult to analyse the relationship between the specific competences, the operational objectives, the methods, and the means of education.

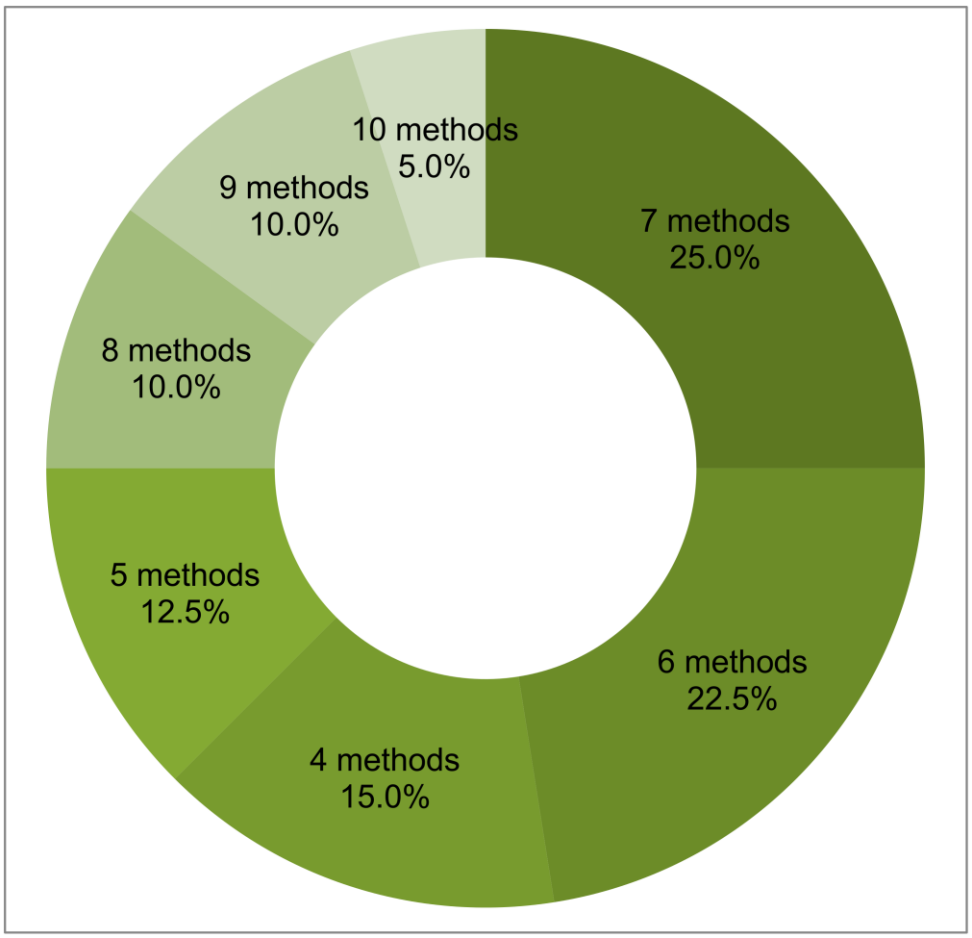

Fig. 7. The number of teaching methods used in 40 lesson plans

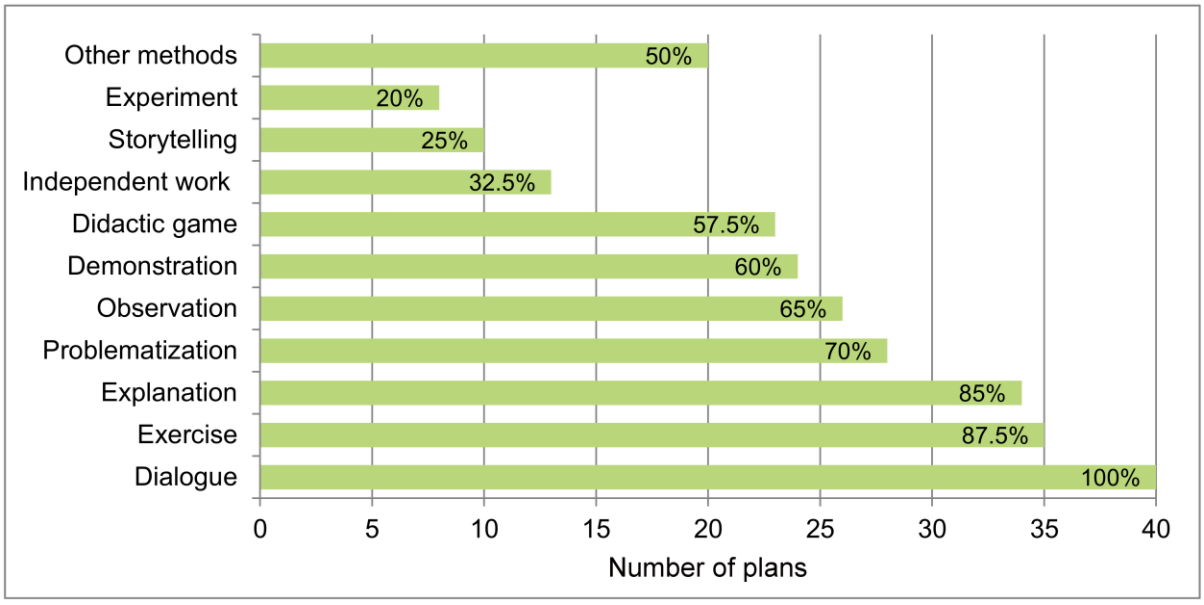

Fig. 8a. The frequency of using certain teaching methods in the 40 lesson plans

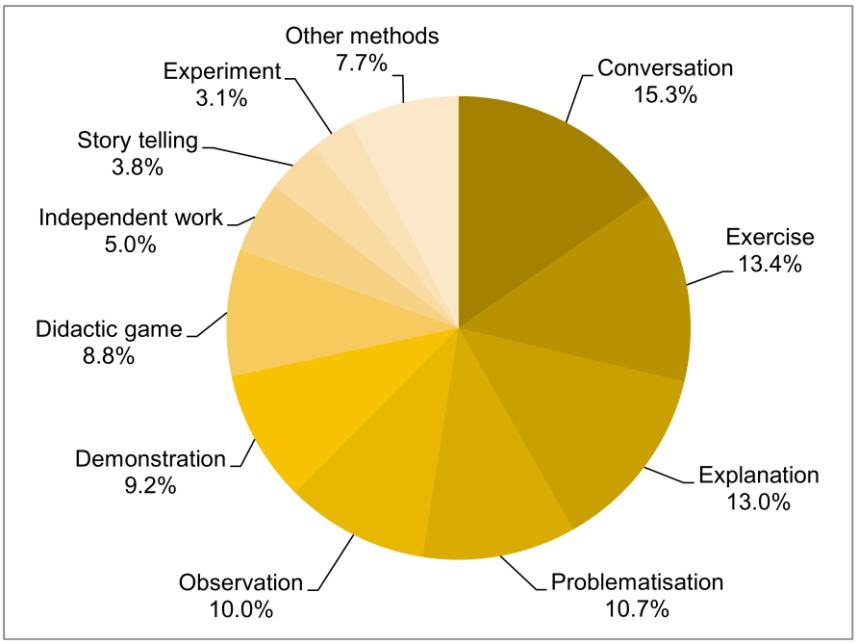

Fig. 8b. The use of each method
out of the total number of methods (261) listed in plans

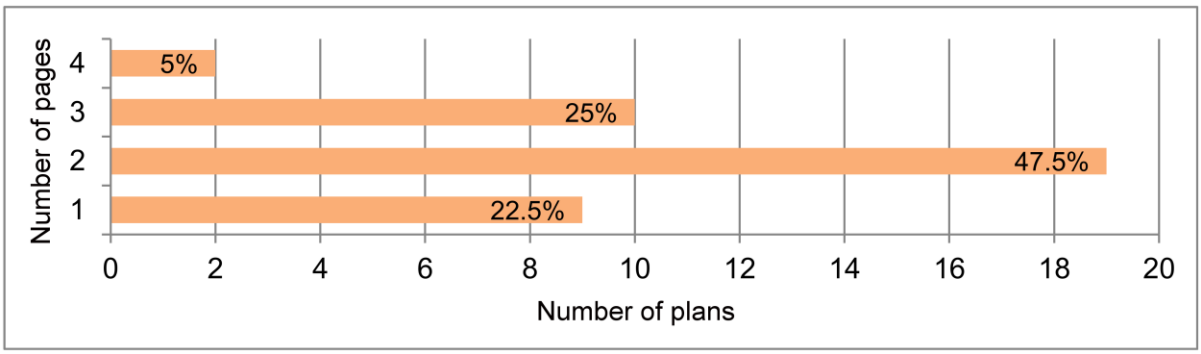

Fig. 9. The extension of the header/introductory component (number of pages)

The extension of the lesson development presentation

Figure 10 showed that that the presentation of learning activities was vaguely extended on 1-2 pages in 12 plans (30%), optimally on 3-5 pages in 23 plans (57.50%), and too extended on 6-9 pages in 5 plans (12.50%). The presentation of the activities had lesser extent than the one of the header in five plans, in four plans the header had equal extent to the presentation of the activities, which demonstrated a brief and incomplete design.

Stan underlined the danger "of developing too large plans and the chances to put into practice such a plan was reduced because of the restrictive time limits within which the teaching activity was done" and stated that dangers could be avoided by "being familiar with the demands according to which the plan should have been structured both on its ideas and on the form of presentation" (2014, p. 223). Gal emphasized that the lesson plan "fell into the precision and the detail

that aimed to achieve success, namely a building meant to last" (1998, p. 56, quoted by Stan, 2014, p. 222). Dulamă argued that "a plan should have been done so that any teacher could put it easily into practice, as a house could be built by any builder on a single plan. To achieve this, the plan should have included all necessary details, like a movie script or a play" (Dulamă, 2008b, p. 120).

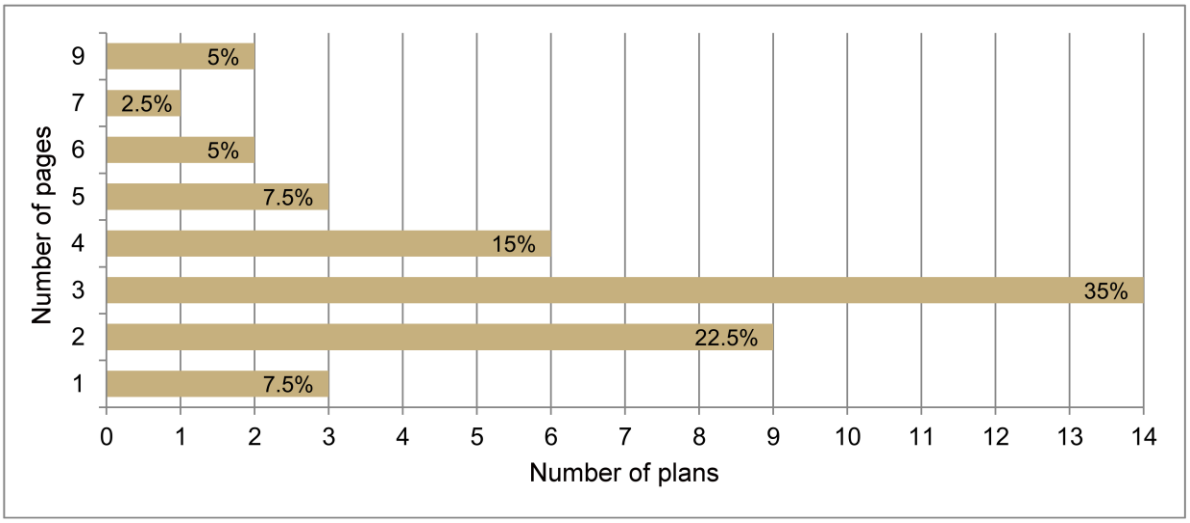

Fig. 10. The extension of the lesson development presentation

The format

In all lesson plans, the development of the activity was presented in a table structure. Bocoş (2013) recommended that in the table should have been mentioned detailed elements, like in Table 5 and in Table 6. We noticed that in the specialty literature, the stages of the lesson were not defined, but only the moments of the lesson.

Table 5. Lesson development/teaching activities (variant 1)

(Bocoş, 2013, p. 153)

The stages of the teaching activity	The teacher's activity	The students' activity	Operational objectives	Activity assessment and other observations

Table 6. Lesson development/teaching activities (variant 2)

(Bocoş, 2013, p. 153)

The stages of the teaching activity	Operational objectives	The content of training	The training strategy	Activity assessment and other observations

In the analysed lesson plans, in the first column (Table 7), the stages of the lesson, the moments of the lesson, the lesson sequences, and the training events were included. Bernat (2003) associated the concept of sequence with learning:

"learning sequence". In the second column, either specific competences or operational objectives were presented, not in words, but with codes (CS 1.1. or O1) which prevented analysing the relationship between the aims and the designed activities. Dulamă recommended to include specific competences and objectives written in words in the table, including the codes of the curriculum. In some tables, there was a column for the informational content or the scientific content of learning (Dulamă, 2010, 2011). We mentioned that various types of content were used in a lesson, not only informational. Because the content used in a lesson was didactically processed, statements such as "scientific content" should have been avoided, since they did not correspond to reality. The contents were presented as descriptive text, but it would have been more useful to be presented in the form of a possible dialogue.

In some plans, the column "Lesson content" was wrongly divided in two columns (teacher's and students' activity) because the activities included also other elements and not only contents. Nor the association *Content* - learning activities, followed by the same division as in the previous situation was correct because the learning activities focused on the students, not on the teacher. We noticed that in most of the plans the teaching strategies were detailed in the *Methods and procedures/Methods/Teaching methods, Means of education/Teaching materials/Teaching aids and Forms/Types of organization.* To optimize the space, we suggested to abandon the column *Forms of organization* because they could be mentioned when detailing the learning activities. The last column in the table was dedicated to all plans evaluation, to formative assessment and to the assessment system. The issues mentioned in that column in the analysed plans were not relevant for a deep understanding of the evaluation process that would have taken place in the classroom.

Table 7. The table structure of the analysed plans

The stages of the lesson	Specific competences	The content of the lesson		Teaching strategies			Evaluation
		The teacher's activity	The students' activity	Methods and procedures	Teaching material	Forms of organization	

Moments Duration	Operational objectives	Content – teaching activities		Strategies			Evaluation
		The teacher's activity	The students' activity	Methods and procedures	Means of education	Types of organization	

The sequence of the lesson	Operational objectives	Time	The scientific content of learning	Teaching strategies			Formative assessment
				Methods and procedures	Teaching material	Forms of organization	

The moments of the lesson	Specific competences	Time	Informational content	Methods and procedures	Teaching aids	Forms of organization	Evaluation system

Training events Time/min	Operational objectives	Informational content	Teaching strategy			Evaluation
			Methods	Aids	Forms of organization	

The moments of the lesson	Operational objectives	Lesson development	Teaching strategy			Evaluation
			Methods and procedures	Aids	Forms of organization	

Teaching event	Specific competences	Scientific content	Teaching strategies	Evaluation

We suggested that the table contained the following key elements: *the moments of the lesson/duration, specific competences, operational objectives, contents, learning activities, teaching methods, teaching materials, and evaluation* (Table 8).

Table 8. Lesson development

The moments of the lesson/ duration	Specific competences	Operational objectives	Contents	Learning activities	Teaching methods	Means of education	Evaluation

3) Lesson development

Most lessons were structured partially or entirely after the sequential learning model proposed by Gagné (1968). That author stated that the functions performed by the *various training events* were: the warming-up; informing students about the pursued objective; stimulating the updating of the previously learned knowledge; presentation of the material-stimulus; providing "guided learning"; getting performance; providing feedback for the accuracy of performance; performance evaluation; intensification of retention and transfer process.

"Guided learning" was designed to be carried out frontally through conversation and/or activities in which students solved tasks individually or in groups. Related to designing the learning activities based on conversation, we noticed some typical mistakes: the wrong form of questions ("What colour is the tree?" "How is spring?"), an incomplete statement or unclear questions ("How long does this phenomenon last?" "What happens to other plants?"), inconsistency in ordering the questions, the existence of some questions that required complex answers ("What changes occur in the life of plants, animals, people?"), the presence of some insignificant questions related to the subject matter, the lack of essential questions, the lack of answers to the asked questions. Regarding the lesson plans, Dulamă stated that "Based on questions and answers, we may assess the level the students work, but also the consistency, the type and the quality of knowledge aimed to be achieved by students." (Dulamă, 2009, p. 279).

Regarding the design of the individual and group learning activities, we noticed the presence of other common mistakes. For instance, they did not explicitly and concisely mention the form of organization, the task, the form of work, the available time, the form of product presentation, if applicable. When

students worked in groups, the task for each group was not mentioned. Dulamă noticed that "students would definitely receive tasks and clear guidance in the classroom, but they were not included in the plan in the most appropriate form" (Dulamă, 2009, p. 280).

In most plans, we noticed the tendency to synthesize the teacher's activities ("the teacher is asking students to open their copybooks", "the teacher is presenting a PowerPoint") and the students' ("Students are solving exercises"), even impersonally ("the exercises are being solved", "the poem is being told", "the song is being sung"). That information did not facilitate the deep understanding of the classroom activities with students, nor did it provide information on the studied content.

"*Achieving performance*" was designed to be achieved by solving problems/exercises/worksheets, by reading a text, by asking questions, with little connection to the operational objectives. In some plans, to prove the achievement of performance, teachers proposed recreational activities: students sang, danced, and recited poetry.

According to these lesson plans, teachers *offered feedback* to their pupils by confirming the correcting of their answers to diverse questions. In certain lesson plans, teachers proposed to ensure feedback by requiring their pupils to solve one more exercise and this meant that the respective teachers did not understand the feedback. Teachers planned diverse forms and methods to *intensify learning and ensure transfer.* They frequently proposed their pupils to solve exercises.

CONCLUSIONS

We drew several conclusions. Firstly, the teachers systemised their lesson plans according to diverse models of lesson structuring and they had different forms. Secondly, we noticed a trend to extend the header very much in the disadvantage of presenting the learning and assessment activities. Thirdly, teachers had diverse difficulties in adapting their lesson planning to the contemporary theories of the curriculum.

References

Bernat, S.E. (2003). *Tehnica învăţării eficiente.* Cluj-Napoca: Editura Presa Universitară Clujeană.

Bocoş, M., Catalano, H., Avram, I., & Someşan, E. (coord.) (2009). *Pedagogia învăţământului preşcolar. Instrumente didactice*. Cluj-Napoca: Editura Presa Universitară Clujeană.

Bocoș, M. (2013). Proiectarea, organizarea și realizarea activității didactice. In Voiculescu F. (coord.), *Elaborarea programului de formare în domeniul didacticii specialității*. București: Editura Matrix Rom, București.

Dulamă, M.E. (2010). *Didactică axată pe competenţe.* Cluj-Napoca: Editura Presa Universitară Clujeană.

Dulamă, M.E., Magdaș, I. (2014). Analysis of the Competences and Contents of "Mathematics and Environmental Exploration" Subject Syllabus for Preparatory Grade. *Acta Didactica Napocensia, 7*(2), 11-24.

Dulamă, M.E. (2009). Studiul unor proiecte de lecţii la ştiinţe. In Bocoş M., Chiş V., Albulescu I., Stan C. (coord.), *Tradiţii, valori şi perspective în ştiinţele educaţiei*, (pp. 277-280). Cluj Napoca: Editura Casa Cărţii de Ştiinţă.

Dulamă, M.E. (2008a). *Elemente de didactică. Teorie şi aplicaţii*. Cluj-Napoca: Editura Presa Universitară Clujeană.

Dulamă, M.E. (2008b). *Practică pedagogică*. Cluj Napoca: Editura Clusium.

Dulamă, M.E. (2011a). *Geografie şi didactica geografiei pentru învăţământul primar şi preşcolar.* Cluj-Napoca: Editura Presa Universitară Clujeană.

Dulamă, M.E. (2011b). *Despre competenţe*. Cluj-Napoca: Editura Presa Universitară Clujeană.

Gagné, R.M. (1968). *Condiţiile învăţării*. București: E.D.P.

http://www.didactic.ro/materiale-didactice/toamna-mandra-darnica-6. Retrieved on November 15 2014.

Ionescu, M. (2009). Demersuri tipice și creative în instrucția școlară și autoinstrucție. In Ionescu M., Bocoș M. (coord.), *Tratat de didactică modernă*. Pitești: Editura Paralela 45.

M.E.N. (2013). *Planul-cadru de învățământ pentru învățământul primar, Ciclul achizițiilor fundamentale - clasa pregătitoare, clasa I și clasa a II-a.* Retrieved on November 15 2014, from www.edums.ro/Legislatieinv%20primar%20pl%20cadru.pdf

M.E.N. (2013). Progr*ama şcolară pentru disciplina Matematică şi explorarea mediului. Clasa pregătitoare, clasa I şi clasa a II-a*. Aprobată prin ordin al ministrului nr. 3418/19.03.2013. Bucureşti. Retrieved on November 15 2014, from http://www.edu.ro/index.php/articles/c539/.

Momanu M. (2009). Forme de organizare ale instruirii. Proiectarea și desfășurarea activității didactice. In Cucoș C. (coord.), *Psihopedagogie pentru examenele de definitivare și grade didactice*. Iași: Editura Polirom.

Organizarea interdisciplinară a ofertelor de învăţare pentru formarea competenţelor cheie la şcolarii mici, Program de formare continuă de tip "blended learning" pentru cadrele didactice din învățământul primar, POSDRU 87/1.3/S/63113.

Stan, L. (2014). *Pedagogia preșcolarității și școlarității mici*. Iași: Editura Polirom.