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Study Regarding the Improvement of the Teaching-Learning Process in Primary Schools through Innovation in Educational Design

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Abstract

The research presented in this paper started from an initial study at the primary school level. Through polls applied through focus groups and questionnaires the teacher's perceptions on determinant factors of the quality of the teaching process at the primary school level were identified.

Starting from these conclusions we considered that a closer attention should be given to the teaching process quality through an approach oriented toward innovation of the educational design and the initiation of some endeavors of improvement at the level of each subject in the educational design is necessary.

The development of the research took place in the school years 2012-2013 and 2013-2014 each of them being a distinct stage in identifying and implementing the solutions considered being the most pertinent in reaching the intended results. The whole enterprise took place according to the Deming cycle/ PDCA (plan-do-check-act).

We have to mention the fact that the research process, that is the identification of the improvement means is not considered closed at the present moment, being, according to the Kaizen philosophy, an everlasting one.

Keywords

Teaching-learning process, primary school, educational design, innovation.

1. Preliminaries

The present research started with a focus group organized at "Nicolae Bălcescu" High School in Cluj-Napoca with 10 teachers responsible of educational quality in five schools in Cluj-Napoca, as shown in Table 1. The debate subject was the identification of the key-factors in

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the quality of the primary school teaching that is the identification of the weak points at the level of teaching process that needs to be improved (Crisan et all, 2010).

Based on the conclusions drawn a joint questionnaire was developed on the subject of the teachers' perceptions that focused on the teachers' perceptions on the quality of the educational system taking into consideration the following dimensions: the teacher, the teaching design (the teaching – learning strategies, time management) and evaluation.

Each item in the questionnaire was given values from 1 to 5 (Lickert scale), where the minimal perceived value is 1 and the maximum one is 5 (corresponding to ratings: to a great extent - 5, to some extent – 4, neutral – 3, to some extent – 2, to a almost no extent – 1. In total, there were 96 questionnaires (see table 1). 95 questionnaires from the 96 applied were returned, the percentage of complete and valid questionnaires being 98, 96%.

Nr. crt.	School Unit	Number of teachers
1.	“Nicolae Bălcescu” Theoretical High School	22
2.	“Lucian Blaga” Theoretical High School	11
3.	“Constantin Brâncuși” Theoretical High School	11
4.	“Onisifor Ghibu” Theoretical High School	30
5.	“Ion Agârbiceanu” School	22

These are the centralized results of the questionnaires for the three sections: the teacher, the teaching design (teaching-learning strategies, time management) and evaluation in the following tables (Crișan, 2015).

We mention that the results are the weighted arithmetic average of the rating given by the teachers.

Table 2. Appreciations on the teacher's activity

I.	THE TEACHER'S ACTIVITY:	1	2	3	4	5	MA
1.	The teacher's experience	8	15	-	52	20	3.64
2.	The stimulation of the students' interest for the subject	-	-	-	23	72	4.76
3.	The teacher's ability to finish each unit in the allocated time	-	2	-	86	7	4.03
4.	The teacher's collaboration with colleagues in making the time planning	6	3	5	41	40	4.12

5.	Participation into meetings of the Methodological Committee to establish the teaching design process efficiency	3	4	-	31	57	4.42
6.	Personal suggestions regarding the quality improvement on the <i>teacher's</i> level: “The implication into innovative proposals referring to the didactic act”; “The active participation in establishing the design efficiency”.						

Table 3. Appreciations on the use of teaching-learning strategies

II.	THE TEACHING-LEARNING STRATEGIES	1	2	3	4	5	MA
1.	The correlation of the objectives with the content units in designing the learning activities	-	-	-	6	89	4.94
2.	The personalized application of the curricula	5	10	6	18	57	4.21
3.	The use of the text book as a work instrument	-	-	-	10	85	4.89
4.	The use of methods that stimulate the cooperation and teamwork	-	6	-	47	42	4.19
5.	The use of auxiliaries	-	-	-	23	72	4.76
6.	The interest for the didactic innovation	-	-	5	9	81	4.80
7.	Personal suggestions regarding the quality improvement on the teaching-learning level: “The work groups/teamworks must be preferred”; “The use of reality simulations for a deeper understanding”; “The increase of the interest for didactic innovation”.						

Table 4. Appreciations on the evaluation applied by the teacher

III.	EVALUATION	1	2	3	4	5	MA
1.	The use of electronic devices and educational software in evaluation	8	35	10	32	10	3.01
2.	The full coverage of all the themes in the units	-	4	-	66	25	4.18
3.	The development of alternative evaluation instruments	3	4	5	71	12	3.89
4.	The identification of ameliorative measures	3	5	7	73	7	3.80

5.	Personal suggestions regarding the quality improvement at the level of <i>evaluation</i> : “The use of modern means of evaluation”; “Evaluation based of group projects”.
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Following the analysis of the results given by the questionnaires they noticed that the whole activity of the teacher in the teaching process is very important. Thus, regardless the personal experience of each teacher, the stimulation of students’ interest for the subject they teach is the most important. The collaboration among the teacher in making the teaching design more efficient, is also, more important and is a starting point in improving the didactic planning.

The allotted time for each unit, as well as the time management is a key-point in designing being considered very important by most of the teachers who answered the questionnaires.

At the level of teaching-learning strategies, the correlation of the objectives with the contents of the units is on the first place closely followed by the use of the textbook as a working instrument. A high degree of importance is also given to the didactic innovation but there are much too few people who take time to research this subject. Most of the teachers think the use of methods that stimulate cooperation and teamwork is important using auxiliary educational resources

As far as evaluation is concerned, the development of alternative instruments of evaluation as well as the identification of improving measures is extremely important.

Because of the importance of the educational design and the interest for innovation an enterprise of innovative didactics planning strategies of the subject “Knowledge of the environment” is necessary.

2. Enterprise of innovative educational design of “Knowledge of the environment” for the second grade

Taking into consideration the weak points where improvements have to be performed (starting from the questionnaires’ results) an enterprise of re-designing of the subject entitled “Knowledge of the environment” for the second grade was started.

In the present paper, because of time reasons, we will succinctly present the interventions made in the calendar planning, starting with the analysis of curricular documents, respectively the identification of the relationships between contents/ units and the setting goals/ reference goals that determined the performance of alterations at this level.

The enterprises oriented towards quality made at the level of educational design on units of content with the purpose of identifying the most effective teaching methods, establishing didactic strategies usable in teaching a particular unit respectively the setting of the evaluation strategy will be presented in a future paper.

2.1. The analysis of the curricular documents on the subject entitled "Knowledge of the environment"

The first step in this direction was the analysis of the curricular documents to this subject, the curriculum, the calendar planning and the one o units with the purpose to identify the present state and the areas that possibly need interventions.

2.2. The analysis of the reationships between contents/units and the setting/ reference goals and the modification performed at the level of calendar planning

At this stage, using QFD (Quality Function Deployment, the correlation of the subjects/units withe the setting goals was performed and the extent to which each unit contributes particulary to reaching the setting goals.

The Quality Function Deployment is a structured method of design and conception of a product that allows the specification and identification of the clients' expectations and needs.

The method proposed by Yoji Akao was implemented by Mitsubishi in 1972 and spread in Japan and the U.S.A. where was popularized by American Supplier Institute (ASI), and presently it has an increased importance in Europe.

The principle of the method is satisfying of the clients' needs referring to a product (also a service and in our case, a unit) in every stage of making the product.

The specific of the method is the fact that all activities related to the product, the stages o existence of the product are analyzed from the client's perspective, not the manufacturer's (Cohen, 1995).

The starting point of this method is the identification and evaluation of the clients' requests, requests that are then transposed into specifications that will be the foundation of the all the activities in manufacturing the product. As a graphic QFD support the special diagram called 'the house of quality'. (Figure 1).

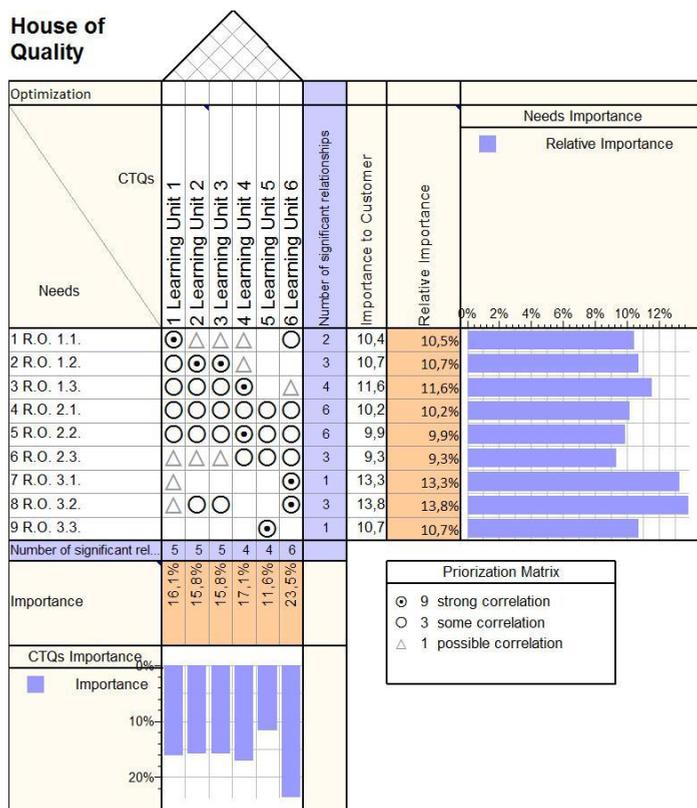


Figure 1. The correlation of the subject's setting goals with the units.

The setting/reference goals identified in the basis on the curriculum is the following:

1. *The development of the observation, exploration and understanding the surrounding reality abilities*

1.1 to describe characteristics of the natural environment;

1.2 to identify similarities and differences between creatures in the close natural environment;

1.3 to observe and name the effects of some natural phenomena on creatures.

2. *Knowing, understanding and using in communication some specific terms to describe phenomena they observed in the natural environment*

2.1 to use a specific language for the natural sciences in describing creatures and natural phenomena;

2.2 to ask questions about the phenomena they observed;

2.3 to use symbols and data referring to phenomena observed in the environment.

3. The development of a positive attitude towards the environment by stimulating the interest towards maintaining a balanced environment and the exercise of some skills of protecting and taking care of it

3.1 to identify ways to contribute to maintaining a healthy environment;

3.2 to participate into activities of protection and caring for the environment.

3.3 to enumerate and describe some own activities in maintaining home and classroom hygiene (MECT, 2003);

Each unit was allocated according to the calendar planning in use, a certain number of classes, respectively setting goals as follows:

Table 3. The allocation of classes on units

Units	Setting goals	Nr. Of classes
1. Elements of the natural environment	1.1	5
2. Plants	1.2, 2.1	9
3. Animals	1.2, 2.1	7
4. Natural phenomena	1.3, 2.1, 2.2, 2.3	4
5. Health education	3.1, 3.2, 3.3	4
6. Environment protection	2.1, 3.1, 3.2	5
Final revision	All goals	1

The setting goals were subjected to a analysis and prioritization process by paired comparison (Armstrong , 2002) (see table 4); the data were introduced in QFD analysis under importance to customer heading (see figure 1).

Table 4. The setting goals prioritization with paired comparison

G.S.	1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	Σ	%
1.1.										37	0,45%
1.2.										38	10,73 %
1.3.										41	11,58 %
2.1.										36	10,16 %
2.2.										35	9,88%
2.3.										33	9,32%
3.1.										47	13,27 %
3.2.										49	13,84 %
3.3.										38	10,73 %

Each goal settings (G.S.) was correlated to each unit (U) the followind values were attributed to it: 1. For the presence of a possible correlation; 3 for medium correlation; and a 9 for a strong correlation. According to the percentage each content element contains in relationship with fulfilling the objectives as a result of QFD in Qualica which was used to make the aplication and the consequent mathematical aparatus, the degree of importance allocated to each unit in percents. Based on those figures the number of classesfor each subject was established and consequently modifications in the calendar planning were performed as shown in table 5.

Table 5. The allocation of number of classes on units

Unit	Importance degree	Nr. of classes (ideally)	Allocated time (cf formal curricula)	Allocated time (cf revised curricula)
1. Elements of the natural environment	16,1%	5,47	5	5
2. Plants	15,8%	5,37	9	7
3. Animals	15,8%	5,37	7	6
4. Natural phenomena	17,1%	5,81	4	6
5. Health education	11,6%	3,94	4	3
6. Environment protection	23,5%	7,99	5	7
			T: 34 hrs	T: 34 hrs

3. Concluding remarks

Following the interpretation of the questionnaires used in this research the conclusion reached was that the educational design is defining for performance in education.

The quality and efficiency of the teaching-learning process is closely related to the educational design. Consequently, an increase in the teachers' involvement in the innovation at a teaching level, active participation to identifying the most effective ways to increase the quality of the educational design through group work/teamwork respectively the use of modern means of evaluation.

The application of different instruments, techniques and advanced methods from the area of quality management, that is the project management (in the present case prioritization diagrams, respectively QFD method, the development of the quality function, etc) in the educational design ensures a rigorous approach of this process, reduces the risk degree and contributes the increase of efficiency and efficacy in the educational process.

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