



PEDAGOGICKÁ FAKULTA
Masarykovy univerzity

PROFILES – WP3:
Stakeholders Involvement and Interaction

PROFILES

Curricular Delphi Study on Science Education

Interim Report on the Third Round of the MU Working Group

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June 2013

Appendix I of the PROFILES Deliverable D3.3:

Report to Stakeholders concerning ‘WP3: Stakeholder Involvement’ and Stakeholders Views regarding a Contemporary Inquiry Based Science Education



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1 Introduction

The main objective of the PROFILES Curricular Delphi Study on Science Education is to find views of different stakeholders to contents and aims of science education in general as well as to engage them in outlining aspects and approaches of modern and desirable science education such as Inquiry Bases Science Education. In particular, the PROFILES Curricular Delphi Study on Science Education seeks to collect in three consecutive rounds different stakeholders' views and opinions about those aspects of scientific literacy that they consider relevant and pedagogically desirable for the individual in the society of today and in the near future (Bolte & Schulte, 2012; Schulte & Bolte, 2012).

The outcomes of this study will serve the development of innovative learning environments (WP4) and the preparation of continuous teacher training courses (WP5) "aiding the implementation and dissemination of PROFILES ideas, intentions and objectives to facilitate the uptake of innovative science teaching and the enhancement of scientific literacy" (PROFILES Consortium, 2010, p. 20).

The stakeholder sample was specified with four groups related to sciences and science education:

- (1) **students** with basic or advanced science courses,
- (2) **science teachers** (education students, trainee teachers, in-service teachers and teacher educators),
- (3) **science education researchers** and
- (4) **scientists**.

In the first interim report on the MU PROFILES Curricular Delphi Study on Science Education, the framework the results from the **first round** of this study were presented. The second round of the PROFILES Curricular Delphi Study on Science Education is based on the findings from the first round which resulted from the analyses of the individually formulated responses of the participants.

The categories used in the **second round** were established in accordance with the Delphi method on the base of the analyses of the first round. In this way, the findings from the first round are specified and concretized using the stakeholders' answers in the second round of this Delphi study (Bolte, 2008). Subject of the second round is the identification of aspects and fields in science education practice according to the opinions of the participants. Another subject of the second round is to identify – by means of cluster analyses – empirically based conceptions regarding desirable and contemporary science education that the participants consider as important and relevant. The FUB hierarchical cluster analyses yielded three concepts of desirable science education (Bolte & Schulte, 2012):

- **Concept A:** Awareness of the sciences in current, social, globally relevant and occupational contexts relevant in both educational and out-of-school settings
- **Concept B:** Intellectual education in interdisciplinary scientific contexts
- **Concept C:** General science-related education and facilitation of interest in contexts of nature, everyday life and living environment

The three concepts are described as the following:

Concept A: Awareness of the sciences in current, social, globally relevant and occupational contexts relevant in both educational and out-of-school settings

Concept A (Awareness of the sciences in current, social, globally relevant and occupational contexts relevant in both educational and out-of-school settings) refers to an engagement with the sciences within the frame of current, social, globally relevant, occupational and both educational and out-of-school contexts, enhancing emotional personality development and basic skills. The impressions a person gets through engaging with topics and associated science-related questions from his or her environment influence both the person's sensibility and his or her attitudes towards the sciences. Dealing with scientific issues or phenomena in out-of-school or social and public contexts respectively also facilitates conscious experiences of scientific phenomena, scientifically precise observation and cognitive ability. Moreover, basic and professionally relevant skills such as finding, interpreting and communicating information can be enhanced in this way. Suggestions for this kind of engagement and education are amongst others provided e.g. by current issues or media coverage. Dealing with the history of the sciences especially reveals how findings and methods of the sciences enable, enhance and bring forward research in the natural sciences. This shows moreover how historical science-related developments are still linked to applications in industry and technology, how these applications changed the world and how they influence our professional and everyday life.

Concept B: Intellectual education in interdisciplinary scientific contexts

Concept B (Intellectual education in interdisciplinary scientific contexts) refers to an engagement with the sciences, their terminology, their methods, their basic concepts, their interdisciplinary relations, their findings and their perspectives, which enhance individual intellectual personality development. Dealing with the sciences serves in this course not only the acquisition of science-related basic knowledge but also helps to understand fundamental findings and the process of gaining knowledge in the sciences. Moreover, dealing with questions and topics of the sciences helps to comprehend and follow (empirical and experimental) scientific research methods, facilitates analytical abilities and fosters the ability to take differentiated perspectives. In addition, an engagement with current scientific research reveals not only how findings and methods of the sciences enable, enhance and support both scientific research and its applications, but also how scientific research is interconnected interdisciplinarily.

Concept C: General science-related education and facilitation of interest in contexts of nature, everyday life and living environment

Concept C (General science-related education and facilitation of interest in contexts of nature, everyday life and living environment) refers to a science-related engagement with everyday life and living environment issues that takes up and promotes students' interests, enhancing general personality development and education. In this way, aspects such as opinion-forming and acting reflectedly and responsibly are particularly important. Dealing with topics from the natural and technological living environment shows how scientific research, scientific applications and scientific phenomena influence both public and personal life. Another important aspect of this concept is engaging with different values and perspectives as well as reflecting on both personal and public deliberations and course of action. Moreover, this concept refers to facilitating the motivation for scientific inquiry beyond school, including aspects such as realizing and shaping one's own interests. Dealing with scientific issues and phenomena within the contexts of social and public fields such as technological developments, their consequences and issues about safety and risks enhances in particular the students' own abilities to judge and both critically reflect and rationally account for their own actions.

The **third round** of the International PROFILES Curricular Delphi Study on Science Education is about considering and further processing these findings from the hierarchical cluster analysis of the second round. Subject of the third round of the International PROFILES Curricular Delphi Study on Science Education is in particular to identify which priority and reality assessments the participants assign to the three concepts of desirable science education derived from the hierarchical cluster analyses in round 2, and to find out where priority and realization in science educational practice drift apart in the opinions of the participants. For this purpose, the concepts that resulted from the FUB hierarchical cluster

analyses were in the third round assessed by the MU participants from two perspectives in the same way as the single categories were identified in the first round were assessed in the second round.

In this course, the third round builds on the outcomes of the second round in the same way as the second round emerged from the results of the first round. The framework, the procedure and the results of the third round of the MU PROFILES Curricular Delphi Study on Science Education will be presented in this interim report.

In months February-June 2013, expert-respondents were asked via e-mail and contact form to fill out specially prepared electronic form and paper form of the PROFILES Delphi questionnaire in the Czech version. 139 experts-respondents gave feedback and sent back filled out answer-sheets. After asking experts all data were collected.

2 Leading questions of the third round

The task of the third round of PROFILES Curricular Delphi Study on Science Education is to address the issues that emerged from the analysis of the results of the first and second rounds. In accordance with the instructions of the Delphi Study coordinator we focused on especially on the following questions:

1.1 Which priorities regarding concepts of desirable science education can be identified in the participants' assessments?

1.2 To what extent are the respective concepts of desirable science education according to the participants' assessments realized in current science educational practice?

1.3 What kind of priority-practice differences can be identified in the participants' assessments?

2.1 Which priorities regarding concepts of desirable science education can be identified in the participants' assessments with regard to different educational levels?

2.2 To what extent are the respective concepts of desirable science education according to the participants' assessments realized in current science educational practice regarding different educational levels?

2.3 What kind of priority-practice differences can be identified in the participants' assessments regarding the different educational levels?

3 What differences or similarities appear in the general assessments between the four different sub-sample groups?

Research questions are examined in the total sample and in the individual groups of the participants of the Delphi Study (students, teachers, education researchers and scientists) as well.

3 Method

Following the curricular Delphi method, all participants who had taken part in the first as well as in the second round of the FUB PROFILES Curricular Delphi Study on Science Education, received in the third round a questionnaire with the three concepts of desirable science education that were identified throughout the hierarchical cluster analysis in the course the

second round (Bolte & Schulte, 2012), and a glossary with the description of the concepts. Students were informed in detail by word of mouth.

The participants were asked to make priority and reality assessments of the three given concepts both in general and, in a second step, differentiated according to different educational levels (pre-school, elementary level, lower secondary education, higher secondary education). For the assessment of the concepts, the participants were given a questionnaire with a six-tier scale. The questions and the scale of the questionnaire are shown in Figure 1 and Figure 2.

Concepts Please assess the following concepts according to the two questions stated.	Which <i>priority</i> should the respective concepts have in science education? 1 = very low priority 2 = low priority 3 = rather low priority 4 = rather high priority 5 = high priority 6 = very high priority	To what <i>extent</i> are the respective concepts realized in current science education? 1 = to a very low extent 2 = to a low extent 3 = to a rather low extent 4 = to a rather high extent 5 = to a high extent 6 = to a very high extent
Concept A: Awareness of the sciences in current, social, globally relevant and occupational contexts in both educational and out-of-school settings	<i>[1] [2] [3] [4] [5] [6]</i>	<i>[1] [2] [3] [4] [5] [6]</i>
Concept B: Intellectual education in interdisciplinary scientific contexts	<i>[1] [2] [3] [4] [5] [6]</i>	<i>[1] [2] [3] [4] [5] [6]</i>
Concept C: General science-related education and facilitation of interest in contexts of nature, everyday life and living environment	<i>[1] [2] [3] [4] [5] [6]</i>	<i>[1] [2] [3] [4] [5] [6]</i>

Figure 1: MU (FUB) questionnaire of the third round – part I: general assessment of the concepts

Concepts Please assess the following concepts according to the two questions stated.	Educational level	Which priority should the respective concepts have in science education?	To what extent are the respective concepts realized in current science education?
		1 = very low priority 2 = low priority 3 = rather low priority 4 = rather high priority 5 = high priority 6 = very high priority	1 = to a very low extent 2 = to a low extent 3 = to a rather low extent 4 = to a rather high extent 5 = to a high extent 6 = to a very high extent
Concept A: Awareness of the sciences in current, social, globally relevant and occupational contexts in both educational and out-of-school settings	Pre-school	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	Elementary level	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	Lower secondary education	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	Higher secondary education	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
Concept B: Intellectual education in interdisciplinary scientific contexts	Pre-school	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	Elementary level	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	Lower secondary education	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	Higher secondary education	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
Concept C: General science-related education and facilitation of interest in contexts of nature, everyday life and living environment	Pre-school	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	Elementary level	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	Lower secondary education	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	Higher secondary education	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]

Figure 2: MU (FUB) questionnaire of the third round – part II: assessment of the concepts regarding different educational levels

The analyses of the questionnaire data were made from three perspectives:

- General assessment of the three concepts of science education by the total sample
- Assessment of the three concepts of science education differentiated according to different educational levels by the total sample
- General assessment of the three concepts of science education by the sub-sample groups.

4 Sample structure and form of the responses

The Delphi method is based on a fixed group of participants throughout the different rounds (Linstone & Turoff, 1975). According to this methodology the 139 stakeholders who participated in the second round of the MU PROFILES Curricular Delphi Study on Science Education were asked in written and electronic form to fill out the PROFILES Delphi questionnaire of the third round between February and June 2013. Table 1 shows the MU sample structure and participation rate with regard to the drop-out between the first and the

second round. We kept the number of participant the same in the round two and three. Only 5 (3, 6 %) stakeholders were exchanged by other person. So we can fixed-participation sampling evaluate as successful.

Sample structure - MU					
	students	teachers	educators	scientists	total
Number of participants round 1	138	30	28	25	221
Number of participants round 2	56	30	28	25	139
Participation rate 2/1	41 %	100 %	100 %	100 %	63 %
Number of participants round 3	56	30	28	25	139
Participation rate 3/2	100 %	100 %	100 %	100 %	100 %

Table 1. Sample structure MU (final status: June 2013)

5 Results of the analyses

In the following chapters, the results of the third round of the MU PROFILES Curricular Delphi Study on Science Education are presented. The results include descriptive-statistical analyses with regard to the priority and practice assessments as well as to the identified priority-practice differences. The analyses and descriptions are made on the basis of both the total sample and the four different sample groups (students, teachers, educations researchers and scientists).

According to the structure of the questionnaire, the description of the results is divided into three parts. The first part (5.1) refers to the general assessments of the three given concepts of desirable science education by the total sample; the second part (5.2) considers the assessments of the concepts by the total sample differentiated according to different educational levels and the third part (5.3) refers to the general assessments of the concepts by the different sub-sample groups.

5.1 Concepts of desirable science education – general assessment by the total sample

This chapter presents the general assessments of the three concepts by the total sample with regard to priority, realization in practice and the calculated priority-practice differences.

We present tables (no numbering) containing the descriptive statistics (mean, standard deviation) regarding the priority-assessment differentiated according to the groups of students, teachers, educators, scientists and adults (including the groups of teachers, educators and scientists).

5.1.1 Priority assessments

The following part presents the general priority assessments by the total sample. Table 2 shows the mean values of the general priority assessments by the total sample.

Concept A: Awareness of the sciences in current, social, globally relevant and occupational contexts relevant in both educational and out-of-school settings		Concept B: Intellectual education in interdisciplinary scientific contexts		Concept C: General science-related education and facilitation of interest in contexts of nature, everyday life and living environment		Significance values		
						A/B	A/C	B/C
Mean value	Standard deviation	Mean value	Standard deviation	Mean value	Standard deviation			
4,7	1,0	4,2	1,2	5,0	1,0			

Table 2: Mean values and standard deviation of the general priority assessments by the total sample

5.1.2 Practice assessments

The following part presents the general practice assessments by the total sample. Table 3 shows the mean values of the general practice assessments by the total sample.

Concept A: Awareness of the sciences in current, social, globally relevant and occupational contexts relevant in both educational and out-of-school settings		Concept B: Intellectual education in interdisciplinary scientific contexts		Concept C: General science-related education and facilitation of interest in contexts of nature, everyday life and living environment		Significance values		
						A/B	A/C	B/C
Mean value	Standard deviation	Mean value	Standard deviation	Mean value	Standard deviation			
3,3	0,9	3,3	1,3	3,2	1,0			

Table 3: Mean values and standard deviation of the general priority assessments by the total sample

5.1.3 Priority-practice differences

This part presents the priority-practice differences (PPD) in the assessments of the total sample (Table 4). The calculated priority-practice differences show the gap that exists according to the assessments of the participants between the priority they assign to a concept and its perceived realization in educational practice. The priority-practice were determined on the basis of all data by subtracting the practice values from the priority values ($\Delta\text{PPD} = X_{\text{Priority}} - Y_{\text{Practice}}$).

Concept A: Awareness of the sciences in current, social, globally relevant and occupational contexts relevant in both educational and out-of-school settings		Concept B: Intellectual education in interdisciplinary scientific contexts		Concept C: General science-related education and facilitation of interest in contexts of nature, everyday life and living environment		Significance values		
						A/B	A/C	B/C
Mean value	Standard deviation	Mean value	Standard deviation	Mean value	Standard deviation			
1,4	1,2	0,9	1,7	1,8	1,4			

Table 4: Mean values and standard deviation of the priority-practice differences of the total sample

5.1.4 Summary

Regarding the general assessment of the three concepts of science education by the total sample, it can be said that the Concept C (general science-related education) is seen as the most important. All three concepts are realized on the same frequency level. The priority-practice differences show that in present science educational all three concepts fall of their given priority. The smallest gap occurs for the Concept B (intellectual education), the largest for the Concept C (general science-related education).

5.2 Concepts of desirable science education – assessment by the total sample regarding different educational levels

This chapter presents the results from the assessments by the total sample differentiated according to the following different educational levels:

- pre-school
- elementary level
- lower secondary education
- higher secondary education

The descriptions are structured again into priority assessments, practice assessments and the calculated priority-practice differences.

5.2.1 Priority assessments

In the following chapter, the priority assessments by the total sample with regard to different educational levels are presented. Table 5 shows the results of the priority assessments of the total sample differentiated according to the different educational levels.

Educational level	Mean values				Significance values		
	Concept A: Awareness of the sciences in current, social, globally relevant and occupational contexts relevant in both educational and out-of-school settings	Concept B: Intellectual education in interdisciplinary scientific contexts	Concept C: General science-related education and facilitation of interest in contexts of nature, everyday life and living environment	Average of all three concepts	A/B	A/C	B/C
Pre-school	3,1	2,4	4,2	3,2			
Elementary level	3,8	3,2	4,4	3,8			
Lower secondary education	4,1	4,1	4,8	4,3			
Higher secondary education	5,2	4,9	4,9	5,0			

Table 5: Mean values of the priority assessments by the total sample regarding different educational levels

5.2.2 Practice assessments

In the following chapter, the practice assessments by the total sample with regard to different educational levels are presented. Table 6 shows the results of the practice assessments of the total sample differentiated according to the different educational levels.

Educational level	Mean values				Significance values		
	Concept A: Awareness of the sciences in current, social, globally relevant and occupational contexts relevant in both educational and out-of-school settings	Concept B: Intellectual education in interdisciplinary scientific contexts	Concept C: General science-related education and facilitation of interest in contexts of nature, everyday life and living environment	Average of all three concepts	A/B	A/C	B/C
Pre-school	2,1	2,0	2,8	2,3			
Elementary level	2,8	2,7	3,2	2,9			
Lower secondary education	3,4	3,4	3,3	3,4			
Higher secondary education	3,7	3,8	3,4	3,6			

Table 6: Mean values of the practice assessments by the total sample regarding different educational levels

5.2.3 Priority-practice differences

In the following chapter the priority-practice differences (PPDs) of the total sample, differentiated according to different educational levels, are presented. Table 7 shows the results of the priority-practice differences differentiated by the different educational levels.

Educational level	Mean values				Significance values		
	Concept A: Awareness of the sciences in current, social, globally relevant and occupational contexts relevant in both educational and out-of-school settings	Concept B: Intellectual education in interdisciplinary scientific contexts	Concept C: General science-related education and facilitation of interest in contexts of nature, everyday life and living environment	Average of all three concepts	A/B	A/C	B/C
Pre-school	1,0	0,4	2,1	1,1			
Elementary level	1,0	0,5	1,2	0,9			
Lower secondary education	1,2	0,7	1,5	1,1			
Higher secondary education	1,5	1,2	1,5	1,4			

Table 7: Mean values of the priority-practice differences of the total sample regarding different educational levels

5.2.4 Summary

All the three concepts by the total sample regarding different educational levels are seen the most important at the higher secondary educational level. At higher secondary education all levels have similar result-level. It can be seen that all the concepts are seen the more realized the higher educational level. However, the priority-practice differences indicate that for all educational levels the concepts' assigned priority is not reflected in practice. Between gaps is not so big difference.

5.3 Concepts of desirable science education – general assessment by the sub-sample groups

This chapter takes presents the general assessments of the different sub-sample groups. For this purpose, the analyses from the general assessment by the four different sub-sample groups (students, teachers, education researchers and scientists), are addressed with regard to priority, realization in practice and the calculated priority-practice differences.

5.3.1 Priority assessments

The general priority assessment by the different sub-sample groups is presented in this chapter (Table 8).

Educational level	Mean values				Significance values		
	Concept A: Awareness of the sciences in current, social, globally relevant and occupational contexts relevant in both educational and out-of-school settings	Concept B: Intellectual education in interdisciplinary scientific contexts	Concept C: General science-related education and facilitation of interest in contexts of nature, everyday life and living environment	Average of all three concepts	A/B	A/C	B/C
Students	4,6	4,0	4,8	4,4			
Teachers	4,6	4,6	5,5	4,9			
Ed. researchers	4,9	4,1	5,1	4,7			
Scientists	4,7	4,4	4,5	4,5			

Table 8: Mean values of the general priority assessments by the sub-sample groups

5.3.2 Practice assessments

The general practice assessment by the different sub-sample groups is presented in this chapter (Table 9).

Educational level	Mean values				Significance values		
	Concept A: Awareness of the sciences in current, social, globally relevant and occupational contexts relevant in both educational and out-of-school settings	Concept B: Intellectual education in interdisciplinary scientific contexts	Concept C: General science-related education and facilitation of interest in contexts of nature, everyday life and living environment	Average of all three concepts	A/B	A/C	B/C
Students	3,4	3,3	2,9	3,2			
Teachers	3,1	3,0	3,2	3,1			
Ed. researchers	3,3	3,8	3,1	3,4			
Scientists	3,3	3,2	3,5	3,3			

Table 9: Mean values of the general practice assessments by the sub-sample groups

5.3.3 Priority-practice differences

The general priority-practice differences assessments by the different sub-sample groups are presented in this chapter (Table 10).

Educational level	Mean values				Significance values		
	Concept A: Awareness of the sciences in current, social, globally relevant and occupational contexts relevant in both educational and out-of-school settings	Concept B: Intellectual education in interdisciplinary scientific contexts	Concept C: General science-related education and facilitation of interest in contexts of nature, everyday life and living environment	Average of all three concepts	A/B	A/C	B/C
Students	1,1	0,7	1,8	1,2			
Teachers	1,5	1,6	2,3	1,8			
Ed. researchers	1,6	0,3	2,0	1,3			
Scientists	1,4	1,2	1,0	1,2			

Table 10: Mean values of the general priority-practice differences of the sub-sample groups

5.3.4 Summary

The general assessments of the three concepts by the different sub-sample groups mainly reflect the tendencies of the general assessment by the total sample. The practice assessments show a very homogeneous picture for all three concepts being not very much realized in science education. More valid assessment must be based on additional statistic testing.

6 Results

In the course of the third round of the MU PROFILES Curricular Delphi Study on Science Education the Delphi study, we found some common important aspects arising from the findings:

- As all concepts are – within different accentuations – assessed as important, it seems that especially the combination of the three concepts would account for desirable and meaningful science education.
- In contrast to the results from the second round, it seems that the assessments by the different sub-sample groups in the third round assessments have converged.
- The higher the priorities are given to the concepts in more advanced the educational level.
- The deeper gaps between priority and practice arise with arising of educational levels.

More detailed conclusions of the analysis are provided in the individual chapters. For more results of the research will provide a more detailed statistical analysis, which we plan to implement. We're ready for a comparative analysis with other PROFILES partners.

7 REFERENCES

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8 Appendix

Czech version of the questionnaire:

DOTAZNÍK 1:

Prosím označte na stupnicích důležitost, kterou připisujete třem pojetím (způsobům) přírodovědného vzdělávání (výuky) podle vaší představy (přání - teorie) a podle skutečnosti ve výuce (praxe - realita). První sloupec je tedy vaše přání, druhý realita.

<p>POJETÍ (ZPŮSOB) VZDĚLÁVÁNÍ (VÝUKY) PŘÍRODOVĚDNÝCH PŘEDMĚTŮ</p> <p><i>Prosíme, ohodnoťte následující pojetí podle dvou otázek v záhlaví sloupců (teorie a praxe).</i></p> <p><i>Pročtěte nejdříve všechna pojetí A, B a C, a pak odpovídejte.</i></p>	<p><i>Jakou prioritu by mělo mít příslušné pojetí (způsob) přírodovědného vzdělávání? (TEORIE - přání)</i></p>	<p><i>V jaké míře je příslušné pojetí (způsob) realizováno v současném přírodovědném vzdělávání (výuce)? (PRAXE - realita)</i></p>
	<p>1 – velmi nízká priorita 2 – nízká priorita 3 – spíše nízká priorita 4 – spíše vysoká priorita 5 – vysoká priorita 6 – velmi vysoká priorita</p>	<p>1 – velmi málo 2 – málo 3 – spíše málo 4 – spíše hodně 5 – hodně 6 – maximálně</p>
<p>Pojetí A: Výuka je zaměřena na představu o významu přírodovědy pro rozvoj společnosti, člověka a na přípravu pro budoucí povolání a každodenní život.</p>	<p>[1] [2] [3] [4] [5] [6]</p>	<p>[1] [2] [3] [4] [5] [6]</p>
<p>Pojetí B: Výuka je zaměřena na intelektuální rozvoj osvojením vědeckých poznatků (objevy, metody, způsoby myšlení) v mezipředmětovém pohledu.</p>	<p>[1] [2] [3] [4] [5] [6]</p>	<p>[1] [2] [3] [4] [5] [6]</p>
<p>Pojetí C: Výuka je zaměřena na propojení s každodenním životem a na vytváření zájmu o přírodovědu a životní prostředí.</p>	<p>[1] [2] [3] [4] [5] [6]</p>	<p>[1] [2] [3] [4] [5] [6]</p>

DOTAZNÍK 2:

Prosím označte na stupnicích důležitost, kterou připsujete třem pojetím (způsobům) přírodovědného vzdělávání (výuky) podle vaší představy (přání - teorie) a podle skutečnosti ve výuce (praxe - realita). První sloupec je tedy vaše přání, druhý realita. Vyplňte, prosíme, u každého pojetí (A, B a C) všechny řádky pro různé stupně škol.

POJETÍ (ZPŮSOB) VZDĚLÁVÁNÍ (VÝUKY) PŘÍRODOVĚDNÝCH PŘEDMĚTŮ <i>Prosíme, ohodnoťte následující pojetí podle dvou otázek v záhlaví sloupců (teorie a praxe).</i> <i>Pročtěte nejdříve všechna pojetí A, B a C, a pak odpovídejte.</i>	Stupeň vzdělání	<i>Jakou prioritu by mělo mít příslušné pojetí (způsob) přírodovědného vzdělávání? (TEORIE - přání)</i>	<i>V jaké míře je příslušné pojetí (způsob) realizováno v současném přírodovědném vzdělávání (výuce)? (PRAXE - realita)</i>
		1 – velmi nízká priorita 2 – nízká priorita 3 – spíše nízká priorita 4 – spíše vysoká priorita 5 – vysoká priorita 6 – velmi vysoká priorita	1 – velmi málo 2 – málo 3 – spíše málo 4 – spíše hodně 5 – hodně 6 – maximálně
Pojetí A: Výuka je zaměřena na představu o významu přírodovědy pro rozvoj společnosti, člověka a na přípravu pro budoucí povolání a každodenní život .	mateřská škola	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	1. stupeň ZŠ	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	2. stupeň ZŠ	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	střední škola	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
Pojetí B: Výuka je zaměřena na intelektuální rozvoj osvojením vědeckých poznatků (objevy, metody, způsoby myšlení) v mezipředmětovém pohledu.	mateřská škola	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	1. stupeň ZŠ	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	2. stupeň ZŠ	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	střední škola	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
Pojetí C: Výuka je zaměřena na propojení s každodenním životem a na vytváření zájmu o přírodovědu a životní prostředí.	mateřská škola	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	1. stupeň ZŠ	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	2. stupeň ZŠ	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]
	střední škola	[1] [2] [3] [4] [5] [6]	[1] [2] [3] [4] [5] [6]