IMPORTANCE OF THE VARIOUS CHARACTERISTICS OF EDUCATIONAL MATERIALS: DIFFERENT OPINIONS, DIFFERENT PERSPECTIVES

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ABSTRACT
The article addresses the issues related to the use and evaluation of educational materials during the teaching process and independent learning. The first part defines the didactic function of educational materials, placing particular emphasis on the optimum explicitness of the educational contents under discussion, the improved rationalization and efficiency of the organization of the teaching process, and increasing students' activity during school instruction and independent learning. The authors argue that the selection of educational materials is influenced by a variety of factors, including educational goals, the educational contents under discussion, the developmental characteristics of learners and, last but not least, the design and availability of educational materials. They also discuss some of the *main criteria* according to which the didactic quality of educational materials can be assessed.

The second part of the article presents the findings of the empirical research study conducted in Slovenia in 2010 and 2011. The research – which consisted of a random sample of 370 teachers and 552 students of three selected and reformed educational programs of vocational education and training – studied the importance that the teachers and students attach to the structural and content characteristics of the educational materials they work with during school instruction and learning.
Key words: educational technology, educational materials, vocational education and training, criteria for the assessment of the quality of educational materials, characteristics of educational materials

INTRODUCTION

Educational materials are one of the key components of *educational technology*. From the general didactic aspect, educational materials can be defined as the didactically adapted materials that the teacher can use during the teaching process as *teaching materials*; for the students who are acquiring or revising their knowledge with the help of the materials, these materials are *learning materials* or *learning sources* (cf. for example Apple & Christian-Smith, 1991). Consequently, educational materials must be prepared in such a way that they help *the teacher* with quality planning and carrying out of the teaching process and *students* with their independent learning, that is, gaining, revising, reflecting on, valuing and using knowledge.

Educational materials are therefore all the specially prepared materials intended to be used during the processes of teaching and learning, in other words, when studying specific educational contents and achieving specific educational goals defined in syllabuses. For that reason, they are appropriately didactically adapted. Educational materials consist of books, encyclopedias, atlases, dictionaries, textbooks, etc.; that is, mostly written materials, which can be either printed or available in electronic form (on digital media or on-line). Both printed and electronic educational materials are indispensable in the teaching process, since they are – in addition to the teacher's direct explanation and other learning activities – an important source for students.

But what does the requirement for a suitable didactic adaptation of educational materials actually mean? To put it otherwise, what characteristics of educational materials have the most decisive impact on their didactic quality, effectiveness and functionality during the processes of teaching and learning? These are the issues addressed in this article; the first part (i) defines the *didactic functions* of educational materials, (ii) defines the *factors influencing the selection* of educational materials during instruction, and (iii) discusses some of the *main criteria* according to which the didactic quality of educational materials can be assessed.

The second part of the article presents the results of the empirical study we conducted in order to find out what level of importance is ascribed to the individual characteristics of educational materials by the teachers and students of vocational education and training (VET) in Slovenia.

The population attending vocational education and training was chosen for two reasons: first, VET programs typically prepare students for entry into the labor market, where employers expect them to possess appropriate work-specific competences; and second, this population is generally less inclined and motivated to acquire academic knowledge. As for educational materials, this means that they have to be didactically designed in a particularly careful way. They have to encourage the acquisition of the knowledge and skills that lead students to

effective vocational competence, while also integrating a high degree of the motivational elements that are effective in attracting students to cooperation during school classes and to independent learning.

In the last decade the area of Slovene vocational education and training has been undergoing fundamental legal and curricular reform processes: new frameworks for national curricula have been adopted, which have a modular structure and are based on competences evaluated in terms of credit points (credit transfer system). Some 20% of the curriculum is flexible, depending on local needs. Learning outcomes are specified in terms of obtaining professional competences (linking theory and practice) and building on key competences and general knowledge (Vocational Education and Training in Slovenia …, 2008, p. 16). The modularly structured and competence-based programs, a closer connection with labor market needs, the openness of curriculum planning and, in this respect, a greater autonomy of educational institutions are the characteristics of VET that undoubtedly have an effect on the expectations for appropriately designed educational materials.

The didactic functions of educational materials and educational technology

In 1970, Gagne wrote about the functions of educational media as an important part of educational technology. For him, the key functions of educational media primarily include presenting the stimulus, directing attention, furnishing external prompts, guiding the direction of thinking, inducing transfer of knowledge and assessing learning attainments (Gagne, 1970, p. 230). The functions that are ascribed to educational technology as a whole are, of course, valid when discussing educational materials as an important part of educational technology, as well. They enable higher explicitness; they help organize instruction more rationally and effectively (thereby realizing the didactic principles of effectiveness and rationality); they stimulate students' activity and effectiveness; they make the process of learning easier; they help acquire knowledge of better quality; they encourage students' independence and critical thinking when selecting/collecting information and so on (cf. also Akhtar, Munshi, & Naseer Ud Din, 2010; Fleischman, 2004; Means & Olson, 1995; Prensky, 2008). As Saglam also emphasizes, "Teaching materials provide a great deal of convenience in teacher's ability to convey a message to students in an accurate, proper, clear and understandable manner; in making abstract knowledge concrete and in enabling students to comprehend complex ideas through simplification. When properly used, printed materials, audio-visual materials and experience-giving methods help make the learning process easy and enduring. Studies concluded that the number of sensing organs activated by the teaching materials used in learning–teaching process is directly proportional to an easy and enduring learning process. In other words, the higher the number of sensing organs activated by the teaching materials employed in learning–teaching process, the better and more enduring the learning process is" (Saglam, 2011, p. 36).

A Slovene author, Jana Kalin (2004), adds some further functions of educational technology and educational materials: the functions of instruction, control, evaluation and organization. She places an especially strong emphasis on:

- *the rationalization and effective organization of the teaching process*: with the use of educational technology we increase students' motivation for learning, stimulate their thinking and illustrate educational contents better, which enables gaining quality knowledge within available (i.e. always limited) time (cf. ibid., p. 212);
- *increasing students' activity*: educational technology can help activate students' sensory channels through which they receive information. This – with a more optimal explicitness – can also help kindle students' interest in the content under discussion and increase their learning *effectiveness* (ibid., pp. 211–212). In this respect, various educational media can help students gain a more comprehensive knowledge of educational contents.

We should not overlook, however, that the role of the professionally well qualified and educated teacher is crucial for a didactically good-quality use of educational materials during instruction. As Valenčič Zuljan et al. assert, a significant factor influencing effective instruction and learning is "the extent to which the teacher manages to stimulate the learner's activity in the process of instruction, especially with learning tasks that aim at achieving the planned educational goals" (Valenčič Zuljan, Peklaj, Pečjak, Puklek, & Kalin, 2012, p. 51).

The use and implementation of good quality educational materials in teaching and learning processes is, without doubt, one of the key components of the teacher's didactic efforts. In this aspect, too, Kalin (2004, p. 212) stresses the importance of the teacher's role when developing and specifying (predominantly operational) educational goals; choosing suitable educational media; preparing, organizing and conducting instruction; and evaluating instruction as well as students' knowledge. In her view, this calls for "a different qualification of the teacher, for innovativeness, creativity and openness to new media" (ibid.).

What are the key factors in selecting educational materials for teaching and learning processes?
Various authors (cf. for example Dowling & Harland, 2001; Ertmer, Ottenbreit-Leftwich & York, 2007; Parker, Bianchi & Cheah, 2008; Wang & Reeves, 2003; Csomai & Mihalcea, 2007) write that the teacher should choose the educational materials to be used during instruction according to educational objectives and planned learning outcomes. Some authors specifically emphasize that the effectiveness of educational materials significantly depends on the already existing (that is, prior) knowledge of learners: "According to studies in cognitive science, an important aspect of the understanding and learning process is the ability to connect the learning material to the prior knowledge of the learner. /…/ The amount of background knowledge necessary for a satisfactory understanding of an educational material depends on the *level of explicitness* of the text. However, it is almost impossible to create pedagogical materials that simultaneously serve the needs of both low- and high-knowledge users" (Csomai & Mihalcea, 2007, p. 557).

Teachers' didactic practice, that is, their anticipation as to how to achieve the objectives (didactic strategies, teaching methods, forms of class organization) is another important factor. Briggs, relying predominantly on Gagne's functions of educational media (Gagne, 1970), maintains that the teacher's decision about the selection of educational media should be primarily deduced from the goals of the practice (i.e. the desired output), learning types, the functions of teaching and the modalities of sensory perceptions (Briggs, 1970).

To summarize, the following factors should be taken into account when deciding on the use of educational materials in the teaching process: the objectives and goals of instruction, the characteristics of educational contents, the intended didactic strategies, the characteristics of the social environment, the characteristics of students and teachers, and the characteristics of the materials themselves (cf. also Kalin, 2004, pp. 213–214). The factors influencing the teaching process are, undoubtedly, intertwined and should therefore be addressed as a synchronous whole.

The objectives and goals of instruction are the starting point for the selection and structuring of materials during instruction. They make up a framework for the selection of the materials that will enable the achievement of specified educational goals (ibid.). According to Gagne (1970), the teacher should not start only from the goals themselves; rather, he/she should establish a connection between educational goals and appropriate ways of learning (such as classical conditioning, operant or instrumental conditioning, psychomotor-chain learning, verbal-associative learning, discrimination learning, learning concepts, laws, principles and rules, and learning as solving problems). Identifying the learning method suitable for a specific goal also makes it easier to identify an appropriate educational medium through which the goals that different ways of learning lead to can be achieved.

Educational contents, as Jana Kalin (2004, p. 213) writes, also define the selection of materials, as the teacher should choose such a medium that will allow for a systematic treatment of the educational content and its credible representation and will take into account learning steps.

When selecting educational media/materials, the teacher should also bear in mind the *didactic strategies* that he/she will use during the teaching process. Kalin (ibid.) distinguishes the media in terms of methods. They can be a means of assistance in learning and teaching, a means of independent learning or a source and transmitter of information. When choosing materials, this is especially important since an appropriate selection of materials will improve motivation, readiness to learn and students' activities, which are, as Radovan emphasizes, the key factors of learning achievements. "In other words, motivation to learn was identified as the most important factor for the interpretation of individual achievement in the learning task" (Radovan, 2011, p. 216).

Considering *the characteristics of students and teachers*, we have to be aware of and take into account students' abilities, gender, age, experience, prior knowledge, working tempo and learning progress (Kalin, 2004). Great importance should also be placed on *the teacher's attitude toward educational media, his/her experience in using educational technology, qualification for its use* and the professional judgment on the manner and frequency of its use (ibid.).

And, finally, *the technical and didactic characteristics of the media/materials* are also highly relevant. The materials have to be didactically adapted, that is, suited to the needs of the teaching process. They should contain and transmit information as well as allow students the attainment of educational goals (ibid., p. 214).

The criteria for the assessment of the quality of educational materials
Within the Institute of the Republic of Slovenia for Vocational Education and Training we have prepared the criteria for the assessment of the quality of educational materials. The criteria applying to the general-didactic suitability, quality and variety of educational materials are the following: the clarity and coherence of the

materials' structure, the quality of multimedia elements, the goal-oriented design of educational materials, the promotion of the development and acquisition of key competences, the use of the inductive approach, the methodical and didactic adaptation of the materials for the needs and characteristics of the target group, the inclusion of motivational elements in educational materials, the provision of stimuli for active learning, the incorporation of the activities that lead to the attainment of goals at different taxonomic levels, and the inclusion of recommendations for establishing connections with other program units (see Table 1 below).

Table 1*:* Criteria for the assessment of the quality of educational materials.

Criteria	Criteria's descriptions
The clarity and coherence of the **materials' structure**	Educational materials are clearly and coherently structured if, among other things: - the title and designed use of the materials are clearly marked at the beginning (the program, module/course, competences), - there is a clear table of contents, - the goals of each individual unit are clearly identified, - the content of the materials is logically arranged, - the conclusion provides a summary or activities for summarizing the content, and - the sources are consistently cited.
The quality of **multimedia elements**	Multimedia elements are suitably integrated in the materials in terms of design and didactics; their didactic (particularly illustrative) role and functionality are easily recognizable. In addition, they are technically and graphically sufficient to fulfill their purpose.
The **goal-oriented design** of educational materials	The materials' contents originate in educational and functional goals, not in systemic sciences or scientific disciplines or areas of expertise. The materials lead to the attainment of goals and allow their users to achieve vocational competences, both generic and occupation-specific.
The promotion of the development and acquisition of **general/key competences**	The materials' contents reveal the author's consideration and integration of the possibilities of acquiring key competences for lifelong learning: • communication in the mother tongue, • communication in foreign languages, • mathematical competence and basic competences in science and technology, • digital competence, • learning to learn, • social and civic competences, • sense of initiative and entrepreneurship, and • cultural awareness and expression.
The use of the **inductive approach**	The materials' contents originate in practical problems, which are subsequently associated with appropriate professional–theoretical and general knowledge. Theoretical knowledge is related with practical knowledge, which makes sense of theoretical knowledge and/or illustrates it.
The **methodical and didactic adaptation** of the materials for the needs/characteristics of the target group	The materials are adapted to the difficulty and level of the educational program. They are structured so as to enable the individualization and differentiation of teaching/learning the contents, and it takes into account students' different learning styles.
The inclusion of **motivational elements** in educational materials	The materials include the elements that strengthen motivation for learning, such as the presentation of goals in the introduction, pictures, graphical illustrations, small icons for easier orientation, interesting facts, real-life examples, life stories, links to other sources, problem-solving, etc.
The provision of stimuli for **active learning**	The materials encourage the user to take the active role at all times; they also expect a response to the presented contents. They offer different activities to practice, revise and test knowledge, as well as questions for thinking and suggestions for project work.

The incorporation of the activities that lead to the attainment of goals at **different taxonomic levels**	The activities planned in the materials lead to the attainment of goals at different taxonomic levels (the revised Bloom taxonomy): • level 1 – remembering • level 2 – understanding • level 3 – applying • level 4 – analyzing • level 5 – synthesizing • level 6 – creating, generating new knowledge • level 7 – evaluating The instructions for doing exercises and performing tasks are clear and allow independent work. The tasks are doable. When reasonable, the materials include keys to exercises or suggestions on how to do them.
The inclusion of recommendations for establishing **connections with other program units**	The so-called cross-curricular connections or recommendations and guidelines for them are included when/if reasonable and didactically justified by adding quality to the materials.

Based on the criteria described above and the processes of rational evaluation, it is possible to assess the quality of educational materials and their suitability for a quality implementation in the processes of teaching and learning. The presented criteria were the basis for the development of the instrument for the identification of the importance that teachers and students ascribe to the various characteristics of educational materials in the programs of vocational education and training in Slovenia. The methodological design and findings of the research are presented in the text below.

The importance of the characteristics of educational materials: the results of the empirical research study[1]
In 2010 and 2011 we conducted a research study in Slovenia in order to achieve two main goals in relation to the students and teachers of three selected, reformed educational programs: we inquired *how often* the students and teachers *use* particular educational materials and *what importance they attach to the structural and content characteristics* of the educational materials they work with during school instruction and learning. The first aspect was examined particularly due to the still persisting school practice that sees the teacher's explanation as the primary – and all too often the only – source from which students gain new knowledge. On the other hand, we were interested in the students' and teachers' views on what characteristics of educational materials they see as more or less important, which can form a basis for the conclusion on what materials they see as being of good quality and would perhaps use on a more regular basis.

THE METHODOLOGY
The descriptive and causal non-experimental method was used for the research. The data were gathered with a questionnaire, which mainly consisted of opinion scales and evaluation scales. The data are presented in frequency and structural tables. Certain variables, although ordinal in nature, were treated as interval variables, and arithmetic means as well as standard deviations were calculated for them. The hypotheses on arithmetic means were tested with the independent T-test, having previously run Levene's Test of Equality of Variances. For testing some of the hypothesis we used Pearson's chi-squared test for independence.

The sample
The questionnaire on the characteristics and use of educational materials was completed by 370 teachers (29.6% of them were men and 70.4% were women) and 552 students (50.4% of them were male and 49.6% were female).

The random sample included the *teachers* working in the reformed programs of *the mechanical technician* (37.5% of those participating), of *health care* (32.3%) and of *the economic technician* (30.2%). More than half of the teachers surveyed (53.0%) taught general education subjects, a good four tenths (41.5%) taught technical subjects or modules, and a negligible few (5.5%) taught both general education and technical subjects. The teachers surveyed had an average of 15.12 years of working experience; those with less than six years of experience amounted to 13.5%, those with six to fifteen years of working experience totaled 42.1%, and the rest had more than fifteen years of experience. It can, therefore, be concluded that the majority of the sample

[1] The research was conducted within the European Social Funds project *The effective implementation of educational programmes and the assuring of quality 2010–2012* as part of *The evaluation of the effects of the implementation of new educational programmes and the assuring of the quality of the pedagogical process.*

consisted of experienced teachers, who can be assumed to be competent enough to give a reliable, professional assessment of educational materials.

The sample of the *students* also randomly included the students from the aforementioned educational programs (the majority, 40.8%, attended the program of *health care*, 32.2% that of *the mechanical technician* and 27.0% the program of *the economic technician*). A third of the students surveyed (33.0%) attended the third year of secondary school, 29.3% attended the fourth year, 23.2% the second year and 14.5% attended the first year of their educational programs. The majority of the students completing the questionnaire (62.3%) thus attended the third and fourth years of educational programs, which can lead us to presume that they were quite experienced in regards to secondary-school educational materials.

The teachers' and students' views on the characteristics of educational materials

An important part of the research carried out among the teachers and students of the three secondary school technical programs referred to their views on the importance of the *characteristics* that educational materials should contain. The aspects relating to the characteristics of educational materials were developed on the basis of the criteria for the assessment of the quality of educational materials discussed above and created within the central Slovene institution responsible for with the development of vocational education, the Institute of the Republic of Slovenia for Vocational Education and Training. The characteristics of educational materials were divided into three groups, called *general* characteristics, *content* characteristics and the characteristics of the *questions and tasks* contained in the materials.

General characteristics predominantly consist of those concerning the structural and design elements of educational materials and the characteristics that were not easily included in either of the two remaining categories. *Content characteristics* concern the quality of the treatment (explicitness, comprehensiveness, understandability, logical correctness) of concrete educational contents, whereas the characteristics of *questions and tasks* mostly refer to the appropriate arrangement, content, understandability, level of difficulty and differentiation of the tasks, which require students to be independent in their learning.

How do the teachers and students assess the importance of the general characteristics of educational materials?

Initially, the teachers and students used a four-point scale[2] to assess the importance of the individual *general* characteristics of educational materials. At first sight, the comparison of the mean values of importance shows that both groups assessed individual elements similarly. Both groups of respondents list the following as the two most important characteristics: (1) the dynamism and diversity of educational materials, that is, the intertwining of various elements (basic texts, more demanding texts, pictures, tasks, questions, interesting facts, practical examples, etc.) and (2) the furnishing of educational materials with the photographs, illustrations and other graphic representations that bring explicitness to the text. These are the only two general characteristics of educational materials whose importance the students assessed with a mean value above 3.40 and the teachers with a mean value above 3.50. These two mean values stand out significantly above the remaining mean values in both groups of the respondents. The third place in terms of importance is given by the teachers to a clear and coherent link (agreement) between educational materials and the goals in the catalog of knowledge, giving it the mean value of 3.37. The students, however, follow the first two characteristics in order of importance with the inclusion of a clear table of contents, giving it the mean value of 3.09 (see Table 1). Likewise, there are statistically significant differences between the values that the teachers and students attach to different characteristics of educational material for almost all the elements, except for the recognizable graphic symbols that mark individual sections of materials and the value they place on interesting covers.

Table 2: The comparison of the mean values assessing the general characteristics of educational materials between teachers and students.

Educational materials …	M Teachers (N = 370)	SD Teachers	M Students (N = 552)	SD Students	α[3]
… are dynamic and diverse, with different intertwining elements (basic texts, more demanding texts, pictures, tasks, questions,	**3.66**	.556	3.41	.725	.000

[2] The variable values were: 1 – completely unimportant, 2 – slightly important, 3 – important and 4 – very important.

[3] In all the cases where the null hypothesis on the differences of population arithmetic means was tested with the T-test, the values of Levene's Test of Equality of Variances were statistically significant.

interesting facts, practical examples, etc.)					
… are furnished with the photographs, illustrations and other graphic representations that bring explicitness to the text	3.56	.574	**3.47**	.707	.024
… include a clear table of contents	3.20	.689	3.09	.872	.039
… have additional e-materials	3.17	.643	2.61	.915	.000
… list the goals that the use of the materials will help achieve in the introduction	3.03	.715	2.65	.853	.000
… contain recognizable graphic symbols that mark individual sections of the materials	3.02	.656	3.00	.818	.589
… cite the sources that the author used when creating the materials and which can provide me with more information on the content under discussion	2.90	.770	2.23	.893	.000
… have an interesting, attractive cover	2.52	.829	2.61	1.020	.115

The mean values that the *students* ascribe to the importance of the individual characteristics of educational materials are generally *lower* by a couple of tenths than the mean values attached to the same characteristics by the *teachers*. The teachers' values given to individual characteristics are also more homogenous, whereas the students' are much more dispersed.

Teachers, being professionals in the area of education, are certainly more aware than students of the importance of the characteristics and their impact on the quality acquisition of knowledge and the carrying out of other activities related to the attainment of educational goals. This is revealed by the frequency distribution, that is, the frequency of the choice of individual values on the four-point scale: while the share of the responding teachers selecting "completely unimportant" as their response remains all but negligible (below 5%) in practically all of the listed characteristics, the share among the students reaches significantly higher values in some characteristics, and in two of them it even exceeds 15%: 15.7% of the students think it is completely unimportant whether materials have an attractive cover or not and as many as 21.9% of them believe it is completely irrelevant whether materials contain the sources that the author used and which can give them more information on educational contents. The high share of the students who believe that citing the sources used is not important (together with those thinking this is only slightly important the share reaches almost two thirds) probably means that during school instruction or independent learning students only rarely turn to other, didactically not adapted sources that the authors of educational materials quote in their lists of references. It does not necessarily mean that they do not use other sources at all; however, it does show that they do not use the educational materials used during school instruction and independent learning as a reference point when searching and choosing other learning sources. It is another matter how much teachers encourage the use of such sources, since the share of the teachers who agree with the students on the (un)importance of the inclusion of sources in educational materials is almost 30%.

Two further points stand out among the responses given by the students on the importance of the general characteristics of educational materials. As regards educational goals, it was expected that the students would find them less important than teachers; it is, therefore, not surprising that 42.2% of them responded it was slightly or not at all important if the introduction lists the goals that the use of the materials help achieve. In general, students, quite understandably, do not consider the categories of educational goals, standards and competences when using educational materials; rather, they focus on educational contents, that is, the knowledge they have to acquire. Educational goals (especially if they are copied from curriculum documents without any appropriate didactic transformation), therefore, do not mean much to many students. It is perhaps a bit more surprising that a relatively high share of the students think it is only slightly or even not at all important if printed materials are supplemented with e-materials – the share almost reaches half of the students (48.8%), whereas the share of the teachers is significantly lower (12.9%; see Table 3).

Table 3: The importance of including e-materials. Comparison between students and teachers.

Students/ Teachers	The importance of including e-materials								Total	
	Very important		Important		Slightly important		Completely unimportant			
	f	f%	f	f%	f	f%	f	f%	f	f%
Students	107	19.6	173	31.7	210	38.5	56	10.3	**546**	**100.0**
Teachers	112	30.6	207	56.6	46	12.6	1	0.3	**366**	**100.0**
Total	**219**	**24.0**	**380**	**41.7**	**256**	**28.1**	**57**	**6.2**	**912**	**100.0**

This is open to more than one interpretation: on the one hand, the data reveal that the use of e-materials is not yet common enough among the students for them to attach any considerable significance to them[4] and, on the other hand, they show that e-materials still do not function in a complementary fashion in relation to the more widespread printed sources. On the assumption that in the future the conditions for the use of e-materials during instruction will become more favorable and that materials in electronic form (e.g. with the use of modern, reasonably priced, but most of all functional e-readers) will become an increasingly more frequent part of the educational process, students will probably attach higher values to them as well.

How do the teachers and students assess the importance of the content characteristics of educational materials?

In addition to general characteristic, the teachers and students also assessed the importance of the *content characteristics* of educational materials. Here, too, they were asked to use the four-point scale to express their views (cf. footnote 2). Both the teachers and students assessed the importance of eleven content characteristics of educational materials (see Table 4).

Table 4: The comparison of the mean values assessing the content characteristics of educational materials between teachers and students.

Educational materials …	M Teachers (N=370)	SD Teachers	M Students (N=552)	SD Students	α[5]
… contain concrete examples illustrating the content under discussion practically	**3.65**	.512	3.17	.737	.000
… contain logically arranged chapters, so that the content of each chapter sensibly follows the content discussed in the previous chapter	3.57	.548	3.30	.727	.000
… contain comprehensive explanations of the topic, which allow independent learning at home, even if the student could not follow the explanation of the topic during school instruction	3.52	.553	**3.47**	.680	.242
… contain a special section that explains new or more difficult concepts	3.26	.664	3.22	.772	.334
… are not too detailed, that is, they do not contain too much information	3.19	.690	2.94	.882	**.**000
… address educational contents cross-	3.14	.634	2.72	.825	.000

[4] This can, furthermore, be concluded from the responses they gave on the frequency of the use of e-materials during school instruction and individual learning, the question that was asked in the second part of the same research study. As many as 73.2% of the students thus said they only rarely (32.2%) or never (41.0%) use e-materials during technical subject classes, with similar answers provided when asked about the frequency of the use of e-materials when learning independently at home: as many as 58.5% of the students never use e-materials at home, and 28.6% of them claimed they only rarely use them. In the context of the otherwise widespread availability and use of computers, the Internet and IT technology in general, these percentages seem extremely high. Yet, they are logical as well: since schools are not equipped with ICT well enough to allow a functional use of e-materials during instruction, students consequently turn to them less often when learning independently at home, too.

[5] In all the cases where the null hypothesis on the differences of population arithmetic means was tested with the T-test, the values of Levene's Test of Equality of Variances were statistically significant.

curricularly as well					
… contain interesting facts and/or anecdotes that make educational contents more interesting	3.13	.772	2.89	.875	.000
… contain a special section after each chapter that briefly summarizes the content discussed by the chapter	3.12	.676	3.20	.803	.108
… contain an introduction that presents the content of the materials in a way which is attractive to students	3.02	.670	2.79	.922	.000
… have specially marked more demanding/additional contents	3.02	.649	2.86	.858	.001
… contain keywords or key thoughts on each page margin recapitulating the content of the chapter or paragraph	2.99	.735	2.83	.850	.002

Both the teachers and students place the highest importance on the logical arrangement of chapters, whereby the content of each chapter sensibly follows the previous one and on comprehensive explanations of the topic, which allow independent learning at home, even if the student could not follow the explanation of the topic during school instruction. This leads to the conclusion that teachers and students primarily expect educational materials to provide them with a clear explanation of educational content, with the authors taking into account the general didactic principles such as explicitness, structural and systematic organization, etc. In the students' view, this was the content characteristic that they attached the greatest importance to.

If we compare the teachers' and students' responses, we see that the mean values that the students ascribe to the importance of the specific content characteristics of educational materials are generally lower by a couple of tenths than the average values ascribed to the same characteristics by the teachers. Again, there is only one exception: on average, the students attach higher importance than the teachers (3.20 vs. 3.12) to the special section after each chapter that briefly summarizes the content discussed by the chapter. There are statistically significant differences between the teachers' and students' values for the majority of characteristics.

The difference between the teachers and students, however, is especially prominent concerning the importance of the presence of concrete examples that illustrate the content under discussion practically (see Table 5).

Table 5: It is important for educational materials to include concrete examples that illustrate the content under discussion practically. Comparison between students and teachers.

Students/ Teachers	**The importance of concrete examples illustrating the content under discussion practically**								**Total**	
	Very important		**Important**		**Slightly important**		**Completely unimportant**			
	f	**f%**	**f**	**f%**	**f**	**f%**	**f**	**f%**	**f**	**f%**
Students	193	35.7	253	46.8	88	16.3	7	1.3	**541**	**100.0**
Teachers	244	66.3	118	32.1	6	1.6	/	/	**368**	**100.0**
Total	**437**	**48.1**	**371**	**40.8**	**94**	**10.3**	**7**	**0.8**	**909**	**100.0**

Although we might expect the illustration of educational content with concrete examples to be equally, if not even more important for the students, it is obviously not true. If we concentrate on the share of the respondents choosing the response "very important" for this characteristic, we will see that the share of the teachers is almost twice as large as that of the students. Among the latter, only a good third think that the inclusion of concrete examples concerning educational contents in educational materials is very important, whereas the view is shared by a great majority of the teachers – almost two thirds. There are a negligible few teachers who think that the characteristic is only slightly important, but the share of the students is as high as 16.3%, with some thinking that the inclusion of concrete examples is completely unimportant. We also inquired if the students' view on the importance of the characteristic of educational materials depends on the frequency of the use of textbooks during general subject classes, technical modules and independent home learning, but we were unable to confirm any statistically relevant interdependence between the variables. The reasons for the fact that almost one fifth of the students do not attach any special importance to the illustration of educational contents with concrete examples is, therefore, a relevant issue worthy of further empirical investigation.

Statistically significant differences between the teachers' and students' views also appear with relation to some other characteristics. Here, we will focus on two more, namely, the view on the importance of cross-curricular treatment of educational contents and the view on the importance of the presence of interesting facts and anecdotes that make the educational content more interesting.

On average, cross-curricular treatment of educational contents is *the least important* content characteristic of educational materials in the students' view (M = 2.72). As Table 6 shows, almost 40% of students think that the characteristic is only slightly important or completely unimportant.

Table 6: It is important for educational materials to address educational contents cross-curricularly as well. Comparison between students and teachers.

Students/ Teachers	It is important for educational materials to address educational contents cross-curricularly as well								Total	
	Very important		Important		Slightly important		Completely unimportant			
	f	f%	f	f%	f	f%	f	f%	f	f%
Students	98	17.9	233	42.6	183	33.5	33	6.0	**547**	**100**
Teachers	102	27.8	218	59.4	45	12.3	2	0.5	**367**	**100**
Total	**200**	**21.9**	**451**	**49.3**	**228**	**24.9**	**35**	**3.8**	**914**	**100**

Perhaps we could assume that the students are not familiar enough with the concept of cross-curricularity to be able to assess the importance of this characteristic of educational materials in the same manner as the teachers. From the students' point of view, the attached importance seems understandable and expected. It can be assumed that students expect educational materials to address the educational content that is directly associated with the aims of the particular subject or module. Knowledge assessment, too, is generally done by teachers assessing students' knowledge of the subject area they teach, with cross-curricular links being the exception rather than the rule. Thus, what may be surprising is the share of the students (60.5%) who nevertheless think that a cross-curricular approach to educational content is important or even very important. In comparison with the teachers (87.2%), the share is significantly lower, but the very high value among the teachers was expected.

Less expected, however, was the difference appearing between the students and teachers when responding to the question about how important they find the presence in educational materials of interesting facts and/or anecdotes that make educational contents more interesting.

Table 7: It is important for educational materials to contain interesting facts and/or anecdotes that make educational contents more interesting. Comparison between students and teachers.

Students/ Teachers	The importance of interesting facts and/or anecdotes								Total	
	Very important		Important		Slightly important		Completely unimportant			
	f	f%	f	f%	f	f%	f	f%	f	f%
Students	149	27.4	217	40.0	145	26.7	32	5.9	**543**	**100.0**
Teachers	116	31.7	185	50.5	60	16.4	5	1.4	**366**	**100.0**
Total	**265**	**29.2**	**402**	**44.2**	**205**	**22.6**	**37**	**4.1**	**909**	**100.0**

Since interesting facts and anecdotes are primarily added to educational materials in order to motivate students to use the materials – authors thus include them, thinking they are of special importance to students – the percentage of the students thinking that interesting facts and anecdotes are slightly important or completely unimportant (32.6%) seems relatively high, especially when compared to the teachers, among whom more than 80% think that it is an important or very important characteristic of educational materials. The data could, perhaps, also be understood through the fact that at least some students use educational materials more or less with the intention of successfully preparing for exams; consequently, they find the characteristics that help them achieve the goal crucially important. Knowing interesting facts and anecdotes, however, is probably not the topic of knowledge examination and assessment in the majority of the subjects of vocational educational and training.

How do the teachers and students assess the importance of the characteristics of the questions and tasks contained in educational materials?

The responding teachers and students were also asked to express their views on the four-point scale on the importance of certain characteristics of the *questions and tasks* contained in educational materials. In terms of importance, this category of the characteristics of educational materials was also given lower mean values by the students than the teachers. Moreover, while only one of the characteristics of questions and tasks was given a

value lower that 3.00 by the teachers, as many as five (out of seven) characteristics were given lower values by the students.

Table 8: The comparison of the mean values assessing the characteristics of the questions and tasks contained in educational materials between teachers and students.

Educational materials …	**M Teachers**	**SD Teachers**	**M Students**	**SD Students**	**α**[6]
… contain understandable and unambiguous instructions for completing tasks	**3.61**	**.536**	**3.21**	**.816**	.000
… contain the questions and tasks that are closely related to the explanation of the educational content and appear in the materials regularly during explanation, not only at the end of chapters	3.28	.652	**3.22**	.757	.181
… contain the tasks which require completing in practical circumstances, e.g. during practical classes	3.23	.733	2.99	.795	.000
… contain the questions/tasks that require students to evaluate the topic under discussion and reflect on it critically	3.16	.619	2.68	.852	.000
… contain the questions/tasks that require the use or at least recall of the knowledge that students gained in other subjects (or modules/units)	3.16	.606	2.83	.841	.000
… contain the questions and task that are clearly arranged at various levels of difficulty	3.09	.650	2.98	.774	.002
… contain the tasks that require the mutual cooperation of two or more students	2.96	.713	2.73	.899	.000

The differences between the teachers' and students' values for almost all the characteristics are statistically relevant. Moreover, the teachers are more homogenous in their assessments when compared to the students, whose values are much more dispersed. However, the order of importance of the characteristics of educational materials does not differ substantially between the teachers and students. In both target groups, the respondents' mean values place understandable and unambiguous instructions for completing tasks and a close relation between the questions and tasks and the explanation of the educational content at the top of their lists of importance.

Practically all the teachers (97.6%) think that understandable and unambiguous instructions for completing tasks are very important or at least important. On the other hand, "only" 80.6% of the students think so; it would be really interesting to know what the 20% of the students who responded by saying that for them the characteristic is only slightly important or completely unimportant (a good 2%) had in mind. We could assume that the latter predominantly include the students who hardly ever or never use educational materials – in which case it is logical that even such essential characteristics as the understandability of instructions is irrelevant for them. This

[6] Except for the characteristic "*Educational materials contain the tasks which require completing in practical circumstances, e.g. practical classes,*" the hypothesis on the equality of variances was rejected in all points.

is partly (although not completely) confirmed by the cross-tabulations of the responses to the question about the frequency of the use of textbooks and the responses to the question about the importance of understandable and unambiguous instructions – in terms of the frequency of the use of textbooks during technical module classes the interrelatedness could not be confirmed. However, there were statistically significant differences between the assessments of the importance of understandable and unambiguous instructions and the frequency of the use of textbooks during general subject classes ($\chi 2 = 49{,}910$, $g = 9\alpha = 0{,}000$) and independent learning at home ($\chi 2 = 19{,}085$, $g = 9$; $\alpha = 0{,}024$). Thus, for instance, among the students claiming they do not use textbooks for any general subject, there are "only" 63.2% of those who find understandable and unambiguous instructions to be important or very important, whereas the share of those saying they use textbooks for all, most or at least some subjects was around 80%.

The teachers and students agree on another extremely important characteristic of educational materials: the interrelatedness of questions and tasks with the explanation of the educational content, appearing in the materials regularly during explanation, not only at the end of chapters – as many as 90.0% of the teachers and 83.2% of the students believe this is very important or important. Since currently used educational materials often place questions and tasks separately from the explanation of educational contents (e.g. at the end of each chapter in the form of revision questions), the respondents' high shares could be an incentive for authors to conceive their educational materials more dynamically in this respect, by intertwining various functional–didactic elements.

Generally, not many teachers – similarly to what we observed when discussing their assessments of the importance of the general and content characteristics of educational materials – express a view saying that any of the characteristics of questions and tasks is entirely unimportant. Approximately one tenth, however, do assess certain characteristics as only slightly important. As for the share of the teachers who selected the responses "slightly important" and "completely unimportant," three characteristics stand out to a certain degree: 15.2% of the teachers say that it is slightly important or unimportant if educational materials contain the tasks that require completing in practical circumstances (e.g. during practical classes). The percentage is not so high after all, because it is important to take into account the fact that the questionnaire was completed by the teachers who teach different subjects and modules, including those who require a more theoretical and those who require a more practical knowledge.

A good 15% of the teachers also believe it is not terribly important whether the questions and tasks in the materials are clearly arranged at various levels of difficulty. The share, again, does not seem too high – a certain share of the teachers would probably insist that secondary school programs are no place for the differentiation of tasks according to difficulty, as all students should acquire both less and more demanding knowledge. Some school subjects or modules, furthermore, are also less extensive, being only taught in one or two school years and in fewer lessons, which consequently means that there are fewer educational contents being discussed and less need for an explicit delineation of the tasks and questions according to their levels of difficulty.

The biggest share of the teachers (22.9%) chose the responses "slightly important" or "completely unimportant" when describing the importance of the inclusion of the tasks that require the mutual cooperation of two or more students. To put it another way, a good fifth of the teachers – if we go by their assessments of importance – perceive facing tasks and questions in educational materials as first and foremost an individual activity of each individual student. In a sense, of course, they are right – to an important degree, *learning* is an explicitly *intrasubjective activity*, and it would be counterproductive if the majority of the questions and tasks expected the cooperation of more students. On the other hand, completing more extensive and more demanding tasks or looking for answers to more complex questions (say, at the highest taxonomic levels) can be more efficiently accomplished in mutual cooperation between two or more students.

The share of the students who think that the tasks requiring mutual cooperation between two or more students are not very important is also relatively high – 40.3% of them selected the responses "slightly important" and "completely unimportant."

An even bigger share of the students think that it is only slightly important or completely unimportant if educational materials include the questions and tasks that require students to evaluate the topic under discussion and reflect on it critically – as many as 42.7% of them share the view. This is also the characteristic where the opinions of the teachers and students differ the most (see Table 9).

Table 9: The importance of the inclusion of the questions/tasks that require students to evaluate the topic under discussion and reflect on it critically. Comparison between teachers and students.

Students/ Teachers	The importance of the inclusion of the questions/tasks that require students to evaluate the topic under discussion and reflect on it critically								Total	
	Very important		Important		Slightly important		Completely unimportant			
	f	f%	f	f%	f	f%	f	f%	f	f%
Students	97	17.8	216	39.6	192	35.2	41	7.5	**546**	**100.0**
Teachers	103	28.1	223	60.8	39	10.6	2	0.5	**367**	**100.0**
Total	**200**	**21.9**	**439**	**48.1**	**231**	**25.3**	**43**	**4.7**	**913**	**100.0**

The share of the teachers who do not place any special importance to this characteristic of educational materials is a good 11%. The share of the students, however, comes close to half of the respondents, with only a good 17% thinking that this characteristic is very important. The data most likely demonstrate that both during school instruction and independent learning students only rarely come across the tasks which didactic theory would place at the highest taxonomic level. Another question would be: How much attention and consideration do teachers pay to such tasks? If teachers are mostly satisfied with tasks at the lower taxonomic levels, it is probably pointless to expect students to attach a high importance to tasks requiring them to evaluate educational contents and reflect on them critically.

The teachers' views on the importance of the characteristics of educational materials that the students did not assess.

As subject and pedagogical experts the teachers were also asked to assess the importance of certain characteristics of educational materials that the students did not assess, since they would, in general, be unable to do so competently. They were the following structural and content characteristics of educational materials:

Table 10: The mean values of the importance of certain structural and content characteristics of educational materials that only the teachers assessed.

Educational materials …	M Teachers (N=370)	SD Teachers
… cover an entire and complete area (module/content unit/subject), not only a specific content section or chapter	3.40	.623
… are structured so that the links (harmonization) with the goals in the catalogue of knowledge are transparent and clear	3.37	.728
… discuss educational contents on the basis of the inductive approach, that is, they start from concrete, practical examples (the learning situation), to which technical-theoretical and general knowledge is then related	3.36	.625
… take into account the fact that students learn in different ways, that is, they have different learning styles	3.30	.680
… contain tasks at all taxonomic levels	3.23	.628
... are supplemented with additional materials for teachers, which contain didactic recommendations for the use of the materials during the teaching process	3.13	.748
… allow good quality internal learning differentiation and the individualization of the teaching process	3.11	.686
… contain the information about what vocational competences can be developed with the use of the materials	2.93	.772
… contain the information about what key competences can be developed with the use of the materials	2.92	.761
… contain the information about what educational program and what program unit the materials are intended for	2.89	.758

As Table 10 shows, the teachers find it fairly important for educational materials to cover an entire and complete area, that is, a technical module or subject as a whole, not only a specific content section or chapter; for the links with the goals in the catalog of knowledge (the national curriculum for each subject) to be transparent and clear; and for the discussion of educational contents to be based on the inductive approach, which starts from concrete, practical examples to which technical–theoretical and general knowledge is subsequently related.

Let us consider this in some more detail: practically all the teachers (94.3%) think that it is important or very important for educational materials to cover an entire and complete area, that is, a module or content unit or subject of a school year; we can, therefore, conclude that they do not favor the materials that only discuss a specific content section or chapter at all. An exceptionally high share of the teachers (92.1%) also believe that it is important or very important for educational materials to be based on the inductive approach, which starts from practical work situations to which technical–theoretical and general knowledge is related. We should not overlook the fact that, at the same time, an extremely high share of the teachers (97.2%) also believe that it is important or very important for educational materials to contain comprehensive explanations of the topic, which allows independent learning at home if, for instance, the student could not follow the explanation of the topic during school instruction. Thus, *both at the same time* are important: educational materials should (at least partly) be based on the inductive approach, since especially in the programs of vocational education and training this can encourage a more effective attainment of vocational competence but, *at the same time*, the educational contents in them should be addressed thoroughly, clearly, comprehensively, systematically and explicitly. This makes the task of the authors of educational materials a particularly challenging one.

On the other hand, the results reveal an important share of the teachers who think that it is only slightly important or even completely unimportant whether educational materials contain the information about what vocational and key competences can be developed with the use of the materials (this is the view of a good quarter of the respondents on both competence types) or the information about what educational program and what program unit the materials are intended for (30.4% of the respondents). Given the fact that as many as 89.1% of the teachers see the structure of the materials where the links with the goals in the catalog of knowledge are transparent and clear as important or very important, it is reasonable to conclude that quite a large share of the teachers do not perceive key or vocational competences to be closely related with the educational goals and knowledge standards defined in the existing curriculum documents. The conclusion, however, would require further analyses, especially in the light of the fact that competence-based design is one of the key characteristics of the reformed VET programs.

CONCLUSION

The article presents the results of the empirical research study we conducted to find out what level of importance is ascribed to individual characteristics of educational materials by the teachers and students of vocational education and training (VET) in Slovenia.

Although the comparison of the mean values of the importance does reveal some degree of similarity in the values given to individual characteristics by both groups, the mean values that the *students* ascribed to the importance of the specific characteristics of educational materials were generally *lower* by a couple of tenths than the average values ascribed to the same characteristics by the *teachers*. The values given by the latter to individual characteristics are also more homogenous, whereas the students' are much more dispersed.

A finding that probably requires further investigation is the one showing that the students attach a relatively low importance to the inclusion of e-materials: almost half of the students responded it is only slightly or even not at all important if printed materials are supplemented with additional e-materials. As we have shown, this leads to the conclusion that the use of e-materials is not yet common enough among the students for them to attach any considerable significance to it, which could be either the cause or consequence of the fact that e-materials are still not complementary to the more widespread printed sources.

We have also established the high importance that both the teachers and students place on the logical arrangement of the contents whereby each unit sensibly follows the previous one, and on comprehensive explanations of the topic, which allow independent learning at home, even if the student could not follow the explanation of the topic during school instruction. In addition, the respondents' mean values place understandable and unambiguous instructions for completing tasks and a close relation between the questions and tasks and the explanation of the educational content at the top of their lists of importance. On the other hand, however, we have found that the students attach a rather low importance to the tasks that require mutual cooperation between two or more students or the evaluation and critical reflection on the topics under discussion. This may suggest that the students do not attach a high importance to the tasks that could be placed at the highest taxonomic levels (e.g. Bloom's evaluating). When looking for the answer to why this is so, we would probably have to turn to the teachers, too: the question, namely, is how much attention and consideration teachers themselves pay to such tasks. If during knowledge examinations or the teaching process they are mostly satisfied with tasks at the lower taxonomic levels, it is probably pointless to expect students to attach a high importance to the tasks that require them to evaluate educational contents and reflect on them critically.

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