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LEARNING METHODOLOGY AND LEARNING SUPPORT IN PUBLIC EDUCATION

THESES OF DOCTORAL (PHD) DISSERTATION

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Content

Introduction

As a teacher educator of initial teacher education and in-service teacher training, I have concerns with the following question: how can future teachers prepare for supporting their pupils' learning process and what factors will influence their work related to supporting learning at schools. My doctoral dissertation reports on the results of research that explores these issues.

Theoretical background

In the first chapter of the dissertation, we have reviewed the theories that constitute the background and starting point of our research. Our goal was to outline the context in which the research questions and results can be interpreted.

As a first step, we dealt with the concept of learning and the content-related changes of the concept, including the socioconstructivist interpretation of learning (Nahalka 2002, 2013) and the characteristics of self-regulated learning (D. Molnár 2013, Kovács 2009). Following this, we elaborated on how these changes, the formation of the new concept of learning resulted in the organic development of the issue of *learning to learn,* as a standalone component of theory and practice (Hoskins & Fredriksson 2008, Hautamäki & Kupiainen 2014). We then reviewed how the new approach institutionalised in the international and domestic pedagogical practice. Finally, we elaborated on the requirements of this new approach towards learning and teaching from teachers and pupils, and the possibilities of measuring the impact and effectiveness of the procedures and methods emerging from the new approach.

Numerous theoretical approaches have been developed related to learning methodology and supporting learning, and in many instances, these served as the foundations for practical materials, guidelines and programs. For an overview of these, see Forrás-Biró (2017).

Learning methodology may play an essential role in teaching to learn, including all methods, strategies, habits that make learning effective, Instead of learning methodology, recently the term *supporting learning* has come in the discourse, which also implies the conceptual change. The essence of this is that pupils are given an active role (compared to the previous concept where the pupils had a passive role), and this also emphasises the shared responsibility (pupil-teacher) for the successful learning process. The approach of supporting learning can be best captured in responses to each other, consciously choosing the applied solutions and continuously evaluation.

Supporting learning assumes, that the teacher is methodologically informed and prepared, however, the emphasis is on supporting the pupil's learning process, therefore the choice of learning methods is no longer the sole decision of the teacher, but it is adapted to different factors of the learning process (pupils' learning characteristics, nature of the curriculum, learning goals, and the impact of these on each other). The pupil is an active participant in his/her own learning, which is supported by the teacher

in a variety of ways: he/she works on such materials and in such organizational manner, that he/she can experience which methods are effective, what are his/her strengths in learning, as well as what are his/her weaknesses in which he/she gets support to overcome. The pupil acquires learning-related self-knowledge during the collaboration with the teacher.

Problem statement

A well-elaborated, theoretically underpinned approach to learning and its institutional frames has emerged in the last decades. This new approach has brought major changes to the concept of learning and the interpretation of knowledge transform process. The interpretation of learning as knowledge creation instead of knowledge transfer has led to the concept of self-regulated learning, which describes a process that is based on the active interaction between the learner and the teacher, and during which the learner acquires mechanisms that are suitable for knowledge building in any specialised field. In such a learning process, acquiring skills plays a major role, including the ability to learn. One of the consequences of this approach is that the importance of programs focusing on learning and teaching to learn has increased in the pedagogical activity – including pedagogical research. In parallel with the emergence of such programs in schools, several methods have been developed to measure the effectiveness of activities focusing on learning and teaching to learn, as well as to provide innovative feedback to schools based on the measurements. This is the point where the present dissertation relates to existing research.

The new approach to learning has slowly become institutionalised over the past two decades, i.e. it has appeared in international documents defining educational frameworks, including the Hungarian national curricula and its related documents. However, one might question how far this approach has gone when it comes to everyday school practice. This question is at the heart of this dissertation. The starting point is the experience that it is hugely varied whether the modern pedagogical approach and the related methods are present (at all) in educational practice. Therefore, our research explores the factors behind the appearance of this approach and the related methods in today's Hungarian schools. Present dissertation deals with the factors which can be analysed based on the available empirical data.

According to literature, the first group of determinants can be called structural factors. These include the characteristics of the school as an institution, the school infrastructure and the physical environment, the curriculum requirements and priorities, the general characteristics of teaching and learning management, the different pupil composition, the composition of the faculty according to age, specialisation and qualification. The second group of factors usually involved in studies can be called subjective factors. The most important among these is the personality of the teacher and the attitudes stemming from it, supportive school leadership, good school climate, cooperative teaching staff. The literature also draws attention to the fact that teachers' work is affected by the organisation, the school they work in, their knowledge, their attitude, and their activities change linked to the organisational

operation (Nahalka & Sipos 2016). Therefore, where it is possible, we include this interaction in our study. The primary hypothesis of our research is that the systematic differences between structural and subjective factors determine the extent to which the systematic teaching of learning (as the primary indicator of the acceptance of the new learning approach) appears in schools. The hypothesis was tested using data collected in two large-scale research. In the first research, which was carried out by a quantitative questionnaire method we mostly focused on the effects of structural factors, while in the second, qualitative research we dealt with the effects of the subjective factors.

In the first, quantitative part of the research, we present the data of two large-scale empirical questionnaires: the first sample's frame was the Hungarian schools, the questions referred to the whole school, and the questionnaire was filled by members of the school leadership. Teachers formed the population for the second sample; the questionnaire used with this sample mapped their personal experiences. With these two questionnaires, we examined to what extent and in what manner were the forms of modern learning supporting present in Hungarian schools these days, whether learning methodology was present as a standalone subject, and what factors could explain the differences that appear between different school in this dimension.

Description of the research

Between June and October 2015, the Zachor Foundation commissioned a large-scale questionnaire inquiry with three components and research based on a series of qualitative interviews. The research was conducted within the framework of the Hungarian Institute for Educational Research and Development TÁMOP 3.1.15-14-2014-0001 project.[1] The empirical data analysed here constitutes four components of the broader research framework with 12 topics.[2]

The questionnaires used in the inquiry included a separate question module on the situation of the teaching of learning methodology and learning support in the examined context. We assumed that the presence of Holocaust as a topic, its teaching, and its management in the schools are related to the level

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I am grateful to the Hungarian Institute for Educational Research and Development for their consent to the use of the data, as well as to the Zachor Foundation for the conduct of the research. The title of the research: *The analysis of the situation and the preparation for training development related to teaching the topic of the Holocaust* (original title: "A holokauszt téma oktatásához kapcsolódó helyzetelemzés és képzésfejlesztés előkészítése"), and its main goal was to provide a comprehensive overview of the teaching of the Holocaust as a topic in Hungarian public school practice.

2

Some parts of the research were published in *The Holocaust, the school and the teacher. The Holocaust as a topic in school teaching: analysis és training development* (original title: „A holokauszt, az iskola és a tanár. A holokauszt téma iskolai oktatása: helyzetelemzés és képzésfejlesztés c. kötet") (Forrás-Biró 2016). The questionnaires used for data collection were developed by myself and András Kovács, the data was collected by Ariosz Szolgáltató, Informatikai és Tanácsadó Kft. I am grateful to Karajánnisz Manolisz, György Fischer, and all the other colleagues from Ariosz Szolgáltató, Informatikai és Tanácsadó Kft. who were involved in the data collection.

of knowledge and use of modern pedagogical methods in the participating institutions; therefore it is related to the teaching of learning methodology and learning support. In the present dissertation, we analyse the research data that is related to learning support and learning methodology, and we do not deal with the other components of the research (see Forrás-Biró 2016).

The quantitative, questionnaire part of our research mainly examines the structural factors' effect. We aimed to reveal *the factors behind the appearance of the new approach to learning in the form of modern learning supporting forms*, and, in case it is present, *to what extent it occurs in Hungarian schools*, and what factors could describe the inter-school differences. Throughout the study, we analysed two fundamental factors: *the characteristics of schools as institutions* and *the characteristics of teacher groups working in schools*. According to this, in the questionnaire phase of our research, we conducted two large-scale empirical inquiry. The first inquiry concerned the school as a whole, and the respondents were schools as institutions. The second inquiry involved teachers filling out the questionnaire.

The „school study"

The population in the school study consisted of schools with 7-12. grade (any of these) pupils. In 2015 there were 3133 such schools in the school address book. The schools were further grouped according to the following four aspects: type of school, maintainer, type of settlement, the region of operation. As the first step, we sent a request letter to participate in the research and the questionnaire to all the schools belonging tot he population (N = 3133). 39% of the invited schools agreed to take part and fill out the questionnaire. As the next step, the respondents' database was weighted against four aspects (the type of school, maintainer, type of settlement (Budapest, city with county rights, city, municipality), the region of operation) aiming to ensure that the respondents' composition equals to the populations' composition.

With the questions in the questionnaire, we explored three scopes related to the presence of learning methodology forms in the respondent schools. First, we looked at whether the pupils receive learning methodology preparation, i.e. whether they are taught during lessons or in other formats how to learn. Then we explored the most common individual learning support solutions in the schools. The third issue we examined was whether the teachers teaching in the schools had participated in professional development focusing on learning methodology, and if so, in what form.

According to our data, pupils receive preparation learning methodology in some form in 45% (N = 565) of the schools. The learning methodology preparation is more often in secondary schools where the maintainers belong to the "other" category and in bigger and city schools than in other institutions.[3] We can observe differences within some categories too: there is more learning methodology training in

[3] From this point forward the differences between the test categories are all statistically significant (Pearson Chi-square < .05)

elementary schools in the city and with „other" type of maintainer than in others, in case of secondary schools there is little difference in favour bigger schools and schools with the church or „other" type of maintainer.

In most schools (80% of schools where it is present) the learning methodology preparation happens during lessons – as an individual subject or as part of another subject (or as both). It is most common as an individual subject when entering upper grades, and at the beginning of secondary school. Besides the lesson type of preparation, the most common form is study circles as an extracurricular activity. This was mentioned by 23% of the respondents. In 73% of the schools offering preparation in learning methodology (33% out of all the schools) pupils have the chance to ask for individual learning support. This type of support is more common in Budapest than in other places. According to the relative majority of the respondents, the individual (or small group) activities have the aim of differential skills- and personality development. Among pupils requiring individual development, the respondents mostly mention those in need of special education and pedagogy support, those in need of catching up, outstandingly talented pupils, as well as those who would like to continue their education. The most common participants of learning support activities are developmental teachers (75%), but school pedagogues and psychologist (30-33%) also take part in them in a relatively high proportion.

77% of the schools offering individual learning support employs a teacher, who has participated in professional development related to learning methodology. In 41% of these schools majority of the teachers has already participated in such professional development focusing on or including learning methodology, that was related to the development of, e.g. disadvantaged pupils or pupils with special educational needs.

The correlational examination of the IT infrastructure in schools and the results of the competence assessment has revealed that in 2014, schools with better IT equipment achieved above-the-average results than schools that lack equipment. Similarly, in 2014, schools that offer preparation in learning methodology achieved slightly better results, especially in reading literacy, than the average.

Based on the results from the school study we may conclude that learning methodology preparation is significantly more common in big, city schools and not in schools maintained by the KLIK, as well as in schools that offer both elementary and secondary education (which obviously has an impact on the school size) than in other institutions. Data also shows that learning methodology training is more often not only in schools with an „other" type of maintainer in its general sense – thus, in schools that often perform special tasks, mostly with a foundation as a maintainer but especially in elementary schools in the cities.

Furthermore, another important result is that when we asked questions related to the frequency and forms of individual learning support, we received a high proportion of responses stating that from those who receive individual learning support *pupils requiring special development* outstand (pupils with

special educational needs, pupils with integration, learning or behaviour difficulties, pupils in need of catch up, outstandingly talented pupils, pupils who would like to continue their education). Moreover, it is important to mention that the proportion of developmental teachers and school psychologists is significantly higher in schools providing learning support.

Based on the responses, it seems that although there is learning methodological support in most schools as part of regular lessons, a high profile learning methodology preparation belongs to the toolset of those schools that considers meeting the special needs of pupils as (one of) their important task, and they also have the flexibility and professional expertise that this task requires.

These research results suggest that such support, in general, is not part of the everyday pedagogical practice in an average school.

The „teacher study"

The second part of the questionnaire inquiry targeted the teachers in Hungarian schools. The study aimed to reveal whether there are systematic differences between teacher groups formed based on their objective indicators that are related to their application of modern learning support methods in their school practice. In the framework of the study, we interviewed those teachers who are either class teachers (regardless of their subject(s)), or teachers of one of the following subjects: History, Hungarian Language and Literature, Ethics, Foreign Language, Art subjects, Media.

During the sampling, we proposed teachers (N = 7593) from those schools that had previously responded to our school study questionnaire. In the end, 2595 teachers from 555 schools filled out the online questionnaire, 2068 of them answered all the questions, while 527 partially filled it out (they did not answer some of the questions). Therefore, the response rate was 34%. Among the respondents, there were 609 teachers teaching History, 870 teaching Hungarian Language and Literature, 693 teaching Foreign Language, and 514 teaching Mathematics. (The teachers could provide more subjects.) 49% of the respondent teachers acquired their degree in undergraduate/college training, and 47% of them has a Masters degree or an equivalent university degree. Three per cent of them took part in higher education vocational training, and one per cent has a doctoral degree. 12% of the teachers responding to the questionnaire were between 22-35 years old, 29% between 36-45 years. More than two-fifths of them (41%) was between 46 and 55 years old. The proportion of respondent teachers elder than 55 years was 18%. The average years of teaching among the respondent teachers is 22,5 years.

92% of the respondent teachers stated that they teach learning methods, learning methodology to their pupils in some form. While 39% regularly deals with learning methodology, 61% only occasionally teaches learning methods to their pupils. In today's Hungarian pedagogical practice, teachers do this primarily within the framework of subject lessons. The elder the teacher is, i.e. the longer the teacher has been teaching, the more likely he/she is to teach learning methods in some forms.

Based on teachers' responses, there is no significant difference between schools concerning the teaching of learning methods according to the type of maintainer, however, the differences according to tot he school type and the type of settlement are significant in the cases where there is only secondary or only elementary education in the schools, as well as in the cases of all the settlement types and municipalities: in the cases of the latter, teaching *learning methods* is rarer in both dimensions.

Teachers of Humanities significantly deal more with teaching *learning methods* than teachers of Sciences.

We chose a few effective learning supporting method (based on the theoretical chapter) that the elder and younger teachers both might have had come across during their teacher education, and we asked whether they practice – i.e. teach – these in their schools. These four methods were the argument (dispute method), creating mindmaps, effective note taking, and drafting good sketches. 16% of the respondents claimed to use all four methods, and with more or less security, 45% of them can be considered as teachers who teach more than one form of learning methods at school.

In the next step we examined whether there were significant correlations between the occurrence frequency of the teaching of the four, abovementioned learning method and, on the one hand, the primary indicators of the school, and on the other hand, the subjects taught by the teachers. The type of the settlement and the school type both correlates significantly with the frequency of teaching *learning methodology*. The bigger the settlement is, the more forms of learning methods are taught by the teachers. The frequency indicator is in a significant correlation with the school type, too: in those schools where there is elementary and secondary school education at the same time, learning methodology is taught in more forms than in other schools. This data is consistent with the school study data.

The frequency of learning methodology teaching forms according to the sub-groups of teachers has revealed, that older teachers with longer school practice and higher qualified teachers, as well as teachers of Humanities, use more such forms than other teachers.

Moreover, we asked the teachers how often they use seven learning organisation method in their teaching practice, including, modern, innovative methods (frontal teacher work, group work, pair work, individual pupil work, cooperative techniques, project work, mosaic method).

Based on the school type (only elementary school, elementary and secondary school, only secondary school), maintainer, and the type of the settlement, the differences between the schools concerning their methods are, similarly to previous results, statistically significant, except in the cases of project work and mosaic method, ie. they are used more often in bigger settlements and bigger schools. There is no significant difference between the teachers according to their age and years of practice.

Thus, in our study, we reviewed the situation of learning methodology in today's schools in two aspects. First, we looked at whether teachers teach learning methodology in various forms at all, and which

schools or groups of teachers are more likely to have this practice. Secondly, we examined which schools use learning organisation which is innovative, involves pupils in the learning process and puts them in an active role. Following this, we aimed to reveal the existence of a correlation between the two indicators, i.e. teachers who have a diverse, innovative learning organisation practice teach learning methods in various forms more often.

There are groups among the respondent teachers that, firstly, do not use innovative learning organisation methods at all, secondly, use some of these methods, and thirdly, use various forms of innovative learning organisation methods systematically. We included the two extreme teacher groups: the group that practically does not use the abovementioned tools and methods at all, and the group that uses almost all methods that we have mentioned above.

When looking closer at the individual groups, we found that in the group using modern methods teachers with a longer practice (more than 16 years), who work in Budapest, in schools that are not only elementary schools, as well as in schools that are not maintained by the government or religious maintainers, who teach Hungarian language, History or Foreign Languages are present in a higher proportion than in the other groups. There is a robust and significant difference between the two extreme groups concerning whether they teach learning methodology to their pupils. Regarding the group using modern methods, data showed that almost two-thirds (64%) of the teachers claimed that they regularly teach learning methodology, 36% of them occasionally. The majority (87%) teaches it both in group and individual forms.

Therefore, the results of the teacher study have revealed not only the inter-school differences but even the differences between the teacher sub-groups, independently from the inter-school differences, correlate with the extent to which pupils receive support in learning methodology. In the studied dimension the differences between schools appear in the school structures, the region of operation and the maintainer, while the differences between the teacher sub-groups appear in the teacher qualification, length of teaching practice and the subject. All these suggest that the structural differences between schools and between teacher sub-groups are accompanied by the differences observed in the presence of learning support in schools. The relationship between the two studied factors requires further research. The data available from the studies analysed within this study indicates that schools in Budapest, that have an elementary and secondary educational profile and are maintained by an „other" type of maintainer have significantly more teachers who use innovative methods and who teach learning methodology than other schools.

Based on our data, we can conclude that in schools that have better structural conditions and are better equipped learning support is more often and more diverse than in other schools. However, the explanation of this correlation requires further research: on the one hand, it is possible that such schools attract teachers who are open for modern methods, and on the other hand, they create such institutional,

organisational opportunities and pedagogical atmosphere that turns the teachers in that school towards such a practice.

Qualitative analysis of teacher interviews

In the first part of our research by the analysis of the questionnaire data, we examined the structural factors that can determine whether modern learning support is present in school activities. In the second part of the research, we explore the same issue from the „subjective" factor's point. We aim to reveal the role of the teacher's personality, the teacher's approach to education, and the teacher's abilities in using or teaching modern learning methods in schools. According to the hypothesis, the above mentioned subjective factors have an independent effect on the role and weight of learning support. However, an interaction between the structural and subjective factors can also be assumed, e.g. those schools that put more emphasis on modern learning support are more likely to attract such teacher personalities that demonstrate broader openness towards these methods. Wherever it is possible based on the research data, we will also discuss this correlation.

The interviews

The study of subjective factors influencing the presence of learning support in schools is based on the data collected in the third phase of the research. In this phase, the interviewers conducted narrative interviews with 101 teachers. The subjects of the narrative interviews are teachers willing to participate, from schools who filled in the school questionnaire.

The conduction of interviews was planned in two steps: at the end of the 2014-15 school year, in June 61, and then at the beginning of the 2015-2016 school year, in August and September 40 interviews were conducted. All the interviewers used the standard interview guideline, where according to the interviewees' answers some questions were discussed in more depth, while some other topics were just briefly mentioned (in case the interviewed teacher did not mention a meaningful experience). The interviews took place in person. The average duration of the interviews was one hour.

When selecting the interviewees, we paid consideration that teachers both from Budapest and the countryside were included. Of the 101 interviews 51 were conducted with teachers working in schools in Budapest, and 50 with teachers working in the countryside (among whom East and West Hungary were represented in a similar proportion). Of the interviews, 38 were conducted with grammar school teachers, 38 with vocational secondary school and vocational school teachers, and 25 with elementary school teachers. When interpreting the grammar school-elementary school ratio, one should take into account that the teachers teaching in the sic and eight years of grammar school belong tot hat category; therefore teachers teaching the age group from 10 to 14 might belong to both groups.

Of the 101 interviewees, 32 were men, 69 women. The majority of the interviewees were from publicly maintained schools (KLIK), but the church- and foundation-maintained schools were also present.

In the first phase of the interviewing, we aimed to include at least two teachers from each school. The number of interviewed teachers per school is between one and six. With little exception, the 101 interviewed teachers were all head teachers at that time or had been head teachers before.

Methodological background

For the analysis of the interview materials from a wide range of qualitative analysis techniques, we chose the methods developed by the representatives of the Grounded Theory. This is primarily justified by the nature of the empirical material. The interviews are semi-structured, where we asked a series of questions from the interviewees, but the interviewers did not interrupt a narratives' associative branches. The interviewees were not asked to talk according to predefined theoretical categories but were encouraged to recall and reflect upon the experiences gained during their pedagogical work. In this manner, such an interview material emerged that is not suitable for analysis with content and text analysis methods using quantification (Ehmann 2002, Krippendorff 1995), because these arrange the data in predefined abstract schemes; therefore they limit the possibilities of emerging categories, and the abstract concepts for the analysis cannot emerge from the data. However, the GT method does not only allow this but also strives to do so.

The GT methodology has developed in different directions during its half-century history. After publishing the first systematic and substantive theoretical and methodological foundations by Barney Glaser and Anselm Strauss (Glaser & Strauss 1967), one of the founding fathers, Anselm Strauss suggested major changes tot he assumptions and procedures of the GT methodology. These were elaborated comprehensively in a book that he co-authored with Juliet Corbin (Corbin & Strauss 1990, in Hungarian: 2015). The most important change compared to the previous version of GT was that while the direction developed by Glaser and Strauss – and represented by Glaser all the time – was based strictly and exclusively on inductive procedures, ie. it considered it unacceptable for the researcher to make any theoretical assumptions, to approach the empirical material with concepts deriving from previous research, and the aim of the analysis to be testing of abstract hypotheses, Corbin and Strauss acknowledged that the researcher should also use readily available categories during the analysis, develop hypotheses, and strive to test them (Horváth & Mitev 2015). The methods of analysis in this dissertation follow this direction.

Corbin and Strauss (2015) called the first and most crucial step in the conceptual analysis of the collected data "open coding" . Open coding assumes the brainstorming approach to analysis because we aim to explore all the possibilities of the data in the beginning. The arrangement of the data into concepts, i.e. the conceptualisation of the data is done in the following way. By screening in depth, we try to understand the essence of the content represented by raw data. We then choose a conceptual name – a term denoted by the researcher – to describe our understanding. First, I chunk the data into manageable pieces. Secondly, I take the data chunks and look at what they contain (interpret them). Thirdly, I assign

conceptual names to the conceptions in the light of how they describe and represent the ideas of the data (Corbin & Strauss 2015).

During the open coding, a set of code of indefinite length is created, which is suitable for sorting the empirical material into classifying categories. The number of these categories is not defined since the aim was not to lose a single element of the material during sorting. The next step of coding is called axial coding by Corbin and Strauss. In this step, the researcher intends to reveal the connections between the categories that were created during the open coding. The open coding and axial coding goes hand in hand. The distinction between the two types of coding is „artificial", and it serves merely explanatory purposes: it informs the reader that although we break down the data and replace them by concepts, we put them back together again when we establish the relationships between the concepts.

By linking the categories, I also refine them. We link lower level concepts to higher level ones. Like building pyramids from interlocking building blocks. The pyramid represents the whole structure that is created by the many elements and the way they are constructed (Corbin & Strauss 2015). However, the structure that emerges in this way means not only the hierarchical arrangement of the concepts according to their abstraction but with selective coding the creation of a category that is called the „central phenomenon". According to Corbin and Strauss (see Horváth & Mitev 2015), with the support of the central category, all other categories can be arranged into a system that can be well-described and explained; thus we arrive at the foundation of a general explanatory theory. GT does not consider the development of this theory necessarily to be the task of the researcher who has reached this point in the analysis.

In the analysis of the interviews, we followed the methodological approach outlined above. First, we present the category system created during the open coding. At the same time, we display the process of the axial coding and map out the relationships between the categories (Figure 1.). Finally, we outline a system that organises the earlier defined codes around central categories; thus, we open the door to the development of an abstract theory (Figure 2. and 3.).

The procedure

Despite the desired procedure by some GT representatives, in our case, the interviewing and the analysis did not proceed in parallel (Charmaz 2000). During the analysis of the text, the interviews' memos were created first. The memos are pieces of text that express contents on the categorical level. The categories of analysis were formulated in parallel with the writing of the memos, and this was followed by the code system used for the analysis (open and axial coding linked together). In the first phase of the coding, the codes changed several times, and the codes were finalised by trial coding of complete interviews. During the coding, some codes proved to be less usable and eventually were omitted from the analysis.

After the trial coding and the alignment of code instructions, the coding was conducted by two coders in parallel, independently of each other (Szabolcs 1996, Krippendorff 1995).

We used binary code. After the completion of the coding, we proceeded to the correction phase. The comparison of the two code tables is an indication of the method's reliability. The consistency between the two coders varies by each code, more complex codes having bigger differences. The interpretation of the codes was complemented by the label that was formulated based on the complete interview. This could be a metaphor the interviewee referred to related to his/her work or a summary label that the coder found appropriate. The labels express content that does not occur in the text explicitly – or only occasionally.

	CODE	SHORT DESCRIPTION
1.	REFLECTIVE	is reflective of his/her teaching
2.	CONSCIOUS	is conscious in his/her teaching
3.	RESPONSIVE	responds to the peculiarities and needs of its pupils
4.	SUPPORTIVE OF LEARNING	teaches learning methods, supports the learning process
5.	INNOVATIVE	uses any innovative solution
6.	PROACTIVE	implements or initiates innovation within the organisation
7.	SELF-FULFILLING	is a devoted teacher, considers every moment of teaching as joy
8.	ROLE CHANGER	shifted towards the role of a facilitator, mediator
9.	EXPERT	is a prepared, careful, professional teacher
10.	CORYPHEUS	blames external circumstances/others if he/she is not able to teach appropriately (according to himself/herself)
11.	PRECISE	is understandable
12.	COMPLAINT	to what he/she typically attributes learning failure
13.	IN CASE OF A PROBLEM	what happens to the pupil who is stuck in the learning process
14.	ORGANIZATION	how the school organisation and colleagues appear

1. table: Code system for the analysis

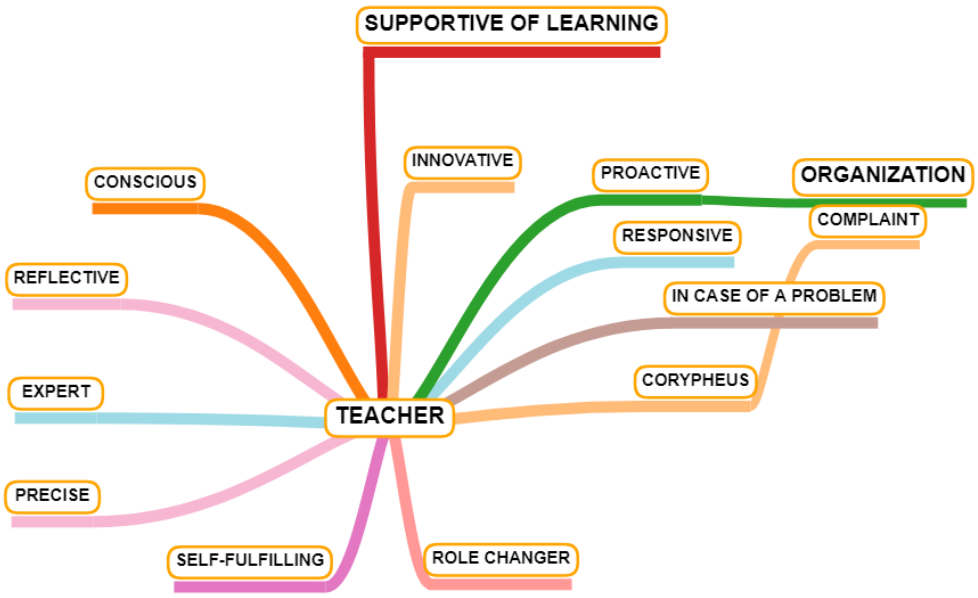

Figure 1. Open and axial coding

Axial and selective coding: the outlines of an inductive explanatory theory

In the axial coding, the relationships between the components of the category cloud, which was developed by the open coding, was explored. The selective coding refers to the final design of the category system, the highlighting of key categories and the integration. By linking the individual codes, we move to a higher level of generalisation, and we also reconstruct the category system in which the interviewee arranges his/her message. In this research, this means that we describe how teacher characteristics are related to learning-supporting attitudes, and we also compare it o the nature of the school where the teacher teaches.

The REFLECTIVE – CONSCIOUS – RESPONSIVE codes refer to similar attitude factors in many respects. During the coding we handled them separately, paying attention to whether they appear together at the interviewees, whether we can create a common feature based on them. Results have revealed that although the co-occurrence of the three characteristics is common, they also occur separately in many instances. Typically, the teacher is responsive; he/she responds to pupil needs and adjust his/her teaching practice. Almost all of those teachers that we described as reflective are conscious and response-ready at the same time. This can be explained by assuming a kind of a curve in changes of teachers' thinking about teacher tasks and engagement, where the first step is responding to pupils getting stuck, curiosity, certain aspects of their learning process. This might be followed by a kind of

consciousness in the design of the learning process, and then reflection can develop. This is just a possible model, as we might think that freshly graduated teachers should be primarily reflective – on the one hand, because reflectivity has a high emphasis during teacher education, and on the other hand, because newly enacted teachers tend to pay more attention to themselves, to their functioning as a teacher –, while consciousness requires some teaching routine. However, if we observe the REFLECTIVE – CONSCIOUS – RESPONSIVE characteristics together, we find that those teachers who can be characterised by all the three codes usually have more than ten years of teaching experience, but it is not rare that these teachers have more decades of experience – this result supports the first explanation.

The joint examination of the REFLECTIVE – CONSCIOUS – RESPONSIVE – INNOVATIVE – SELF-FULFILLING – EXPERT TEACHER – ROLE CHANGER characteristics has revealed that those teachers that have a higher aggregated value of these characteristics are more supportive of learning than teachers having a lower aggregated value. The high aggregated code value is mostly occurring with the teacher having more than ten years of teaching experience, but in many instances, even much more.

The comparison of the ROLE CHANGER and SUPPORTIVE OF LEARNING codes has shown that those teachers that we described as role changers bear learning-supporting attitudes (with a few exceptions of teachers teaching in high prestige grammar schools where there might be less need for supporting pupils' learning). Meanwhile, learning support occurs among among non-role changer teachers, too, and this suggests that the learning supporting attitude does not occur only when there is a change in the approach and a methodological renewal (which can be both assumed at the case of the role changer code), but also in a more traditional approach.

Selective coding involves the structuring of the system that has evolved from the axial coding, and this elevates the abstraction to a higher level. During this, the hierarchical relations between the code categories emerge, which is the next step towards a theoretical causal explanation. In our analysis, the ROLE CHANGER – CORYPHEUS codes emerged to be the main axis of the system, and the opposition of the teacher attitudes indicated by these codes was also revealed.

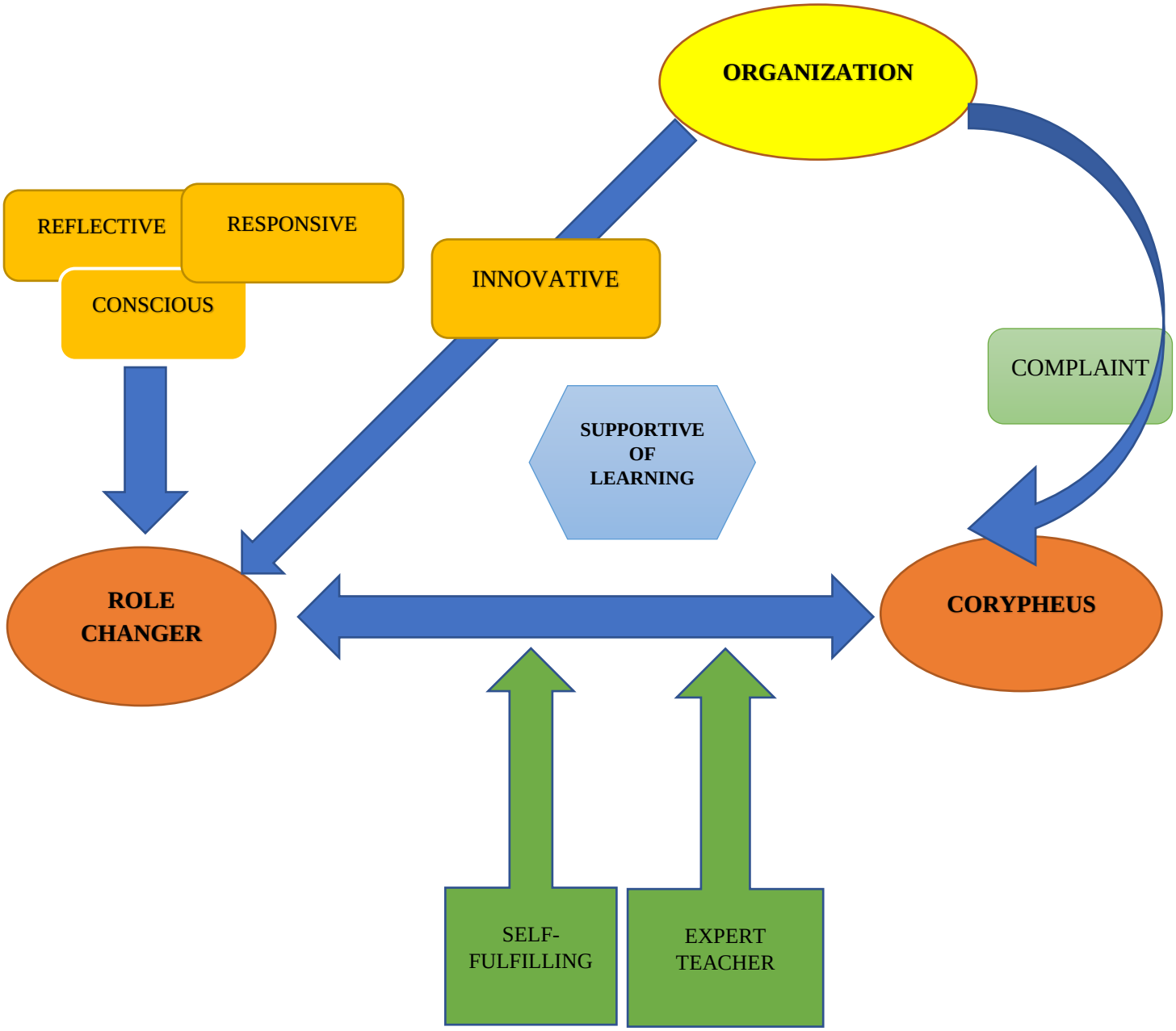

Figure 2. The structure of selective categorisation

The figure shows the central codes and the related codes of the analysis. Codes that proved to be not strong enough during the analysis are not indicated on the figure (PROACTIVE, PRECISE, IN CASE OF A PROBLEM).

The ROLE CHANGER teacher tends to have shifted towards a supportive attitude in their everyday teaching practice and approach to teaching: they are more supportive of learning than corypheus teachers. Many interviewees formulated some complaint, difficulty that they had experienced during

their work (these will be more elaborated on at the results of the COMPLAINT code), and while these might appear legitimate, well-established, existing difficulties, but they can also be considered as general topos supporting teachers' coping mechanisms (e.g. „today's children are so unmotivated"). During the analysis we could not decide on the extent to which the difficulties were established, the CORYPHEUS code referred to the way the interviewees reacted on the difficulties, their solutions, and the attitudes they demonstrated when handling difficulties. At this point, it becomes evident that the question is not whether the impression of a teacher of perceiving a factor or phenomena as a difficulty (that according to him/her hinders the optimal work) being well established, but rather the way the teacher reacts to this difficulty and his/her coping repertoire. The CORYPHEUS characteristic primarily refers to a case when the interviewee, besides mentioning the difficulties parries the responsibility when he/she presents his/her practice about external circumstances. We described a teacher as CORYPHEUS when the context revealed that due to the parry of responsibilities, he/she did not use teaching methods differing from the traditional ones. When choosing this name, we sought to describe the characteristic with a term not used in the terminology of educational science, which allows to present and discuss the relevant manifestations in the least grading way. The controlling personality and the prestigious feature that appear in the word CORYPHEUS, and these can be considered as counterpoints to the perception of the role of being facilitator and mediator. Although this feature often includes elements of teacher burnout, we failed to express this in the name of the code.

The ROLE CHANGER – CORYPHEUS dimension is nuanced by the characteristic described as the EXPERT TEACHER code. Based on the analysis we arrived to a result, that the EXPERT TEACHER characteristics suggest a teaching practice that is reliable, attentive, pays attention to pupils, as a kind of an intermediate feature, because the analysis did not reveal any shift or expected shift towards any of the extremes on the axis of ROLE CHANGER – CORYPHEUS. Therefore, we are not able to say whether the presence of the EXPERT TEACHER feature predicts a shift towards a change in the teacher role. Based on considerations revealed concerning professional development, we may assume that in case the expert teacher receives relevant impulses supporting professional development at the right time, the shift in attitude towards a role change might start. Similarly to this, an innovation-supporting school organisation can also provide a sound basis for maturing teachers' professional attitude.

Both the ROLE CHANDER and CORYPHEUS teacher attitude can be related to the characteristic of the school as an organisation. The form of support that a teacher expects from the organization may appear in his/her responses to the difficulties perceived during work – we may think of the values represented by the school leadership and/or school documents, the attitude of the faculty, cooperation of the faculty, the practice of workgroups or even smaller, non-formal professional communities. The support in practice can be very diverse; besides the concrete solutions, from the point of the analysis it is vital to what extent the interviewee perceives his/her organizational background as supportive, Therefore, in Figure 2. the organization, based on its real role, could be closer to or further from the

teacher. The organization may alter the attitude of teachers to learning support: although it may happen that a teacher is a corypheus focusing on difficulties and passing the responsibility of a less successful learning/teaching process onto external circumstances, but the need for learning support is firmly evident in the organizational culture, e.g. the support of underperforming pupils, therefore the teacher also participates in the process, and practices certain solutions of learning support. The role of the organization is particularly important, because, after their teacher education, the early-stage teachers practice their routine in schools, therefore in a school that is less learning-supportive the approaches learnt in their teacher education may prove to be less adaptive, and this predicts that these will drop out of the teachers' practice in the long term.

During the qualitative analysis, we aimed to reveal the patterns describing teachers learning-support-related activities, as well as the different factors influencing this in its implementation. The analysis has pointed out, that despite the technical knowledge (learning methodology) acquired during teacher education being an important factor, in cases of most teachers this did not seem enough to conduct their everyday work with a learning-supportive attitude. Moreover, key factors may include the integration of everyday teaching experiences, the responses to these, the cultivation of the reflective approach, the coping mechanisms that were activated by the challenges of the teaching profession, the characteristics of the school organisation and the interplay between these factors. These factors play a role in the development of learning-supportive attitudes in a non-quantifiable manner. There are probably teachers whose strong reflection contributes to their learning-supportive attitudes, but a similar effect can be achieved by the meticulous practice of subject-specific methodology related to pupils' responses. The development of the learning supporting attitude is influenced by the school organisation through the declared values and the daily practice of teachers.

The analysis has revealed that merely the technical knowledge on learning methodology does not trigger learning-supportive attitude; in fact, it generates hostile feelings and strong resistance in teachers (and pupils).

The two-axis explanatory model of the analysis

As a result of the analysis, the code categories can be placed on a spacial plane divided into four parts (Figure 3.). The two categories at the two endpoints of the horizontal axis are the two most distant ones: one endpoint represents the ROLE CHANGER category which expresses the attitude that can be characterized by the shift from the knowledgable teacher role towards the facilitator teacher role, and by the teaching practice that aims at knowledge construction instead of knowledge transfer; the other endpoint represents the CORYPHEUS category, where the central elements are the inflexible handling of difficulties during teaching, the inflexible teaching methods, less response to pupils' needs, lack of initiating own solutions, and lower reflection. The ROLE CHANGER category can be characterised by the close relationship with the innovative and learning-supportive categories, which, however, are

independent attitudes, i.e. they are not equal to the role changer attitude; moreover, they may be associated with attitudes that are closer to the other endpoint of the axis. The most typical category between the two endpoints is the EXPERT TEACHER which, based on its general characteristics, can be close to the CORYPHEUS TEACHER, but during the activities organised around the transfer of the knowledge in case of the former one teachers are more open to the use of modern learning supporting methods. This position is well indicated by the fact that while 96% of the role changers have the expert teacher characteristic, only 33% of those belonging to the expert teacher category is role changer, but only 12% of them belongs to the corypheus teacher category. Another intermediate category is the SELF-FULFILLING, which is closer to the ROLE CHANGER category.

On the vertical axis of the plane, one of the endpoints is the CRITICAL-SELF-ABSOLVER category, and the other endpoint is the CRITICAL-DOER category. The majority of the interviewees listed factors that prevent them from using innovative learning organisation and learning supporting methods in their activities. Some of the respondents talked about these difficulties in a self-reliant way, explaining why they did not use such methods in the school, while for another group, these difficulties were obstacles that could be overcome. But not only the role changer type considers these difficulties in such manner, but we can observe this narrative in case of those who are closer to the corypheus teacher type – e.g. the expert teacher type; however, the way of problem-solving can be different in this case.

The static model presented here gives the impression that the shift from one position to another one within this category system is complicated. This impression is corrected by the introduction of the ORGANIZATION category (the blue circle on the figure). The organisation where the teacher works affects whether a teacher's learning supporting attitude is developed. This effect is well reflected in the interview texts. The movements between the categories are strongly influenced by the behaviour of the school leadership and the teaching staff: how the leadership reacts on the initiatives of teachers with role changer and critical attitudes, how much they support the downsizing or maintain the corypheus teacher attitudes, whether the school takes the inevitable risks when introducing innovations, whether the school support further training, whether the colleagues collaborate on the use and development of new methods.

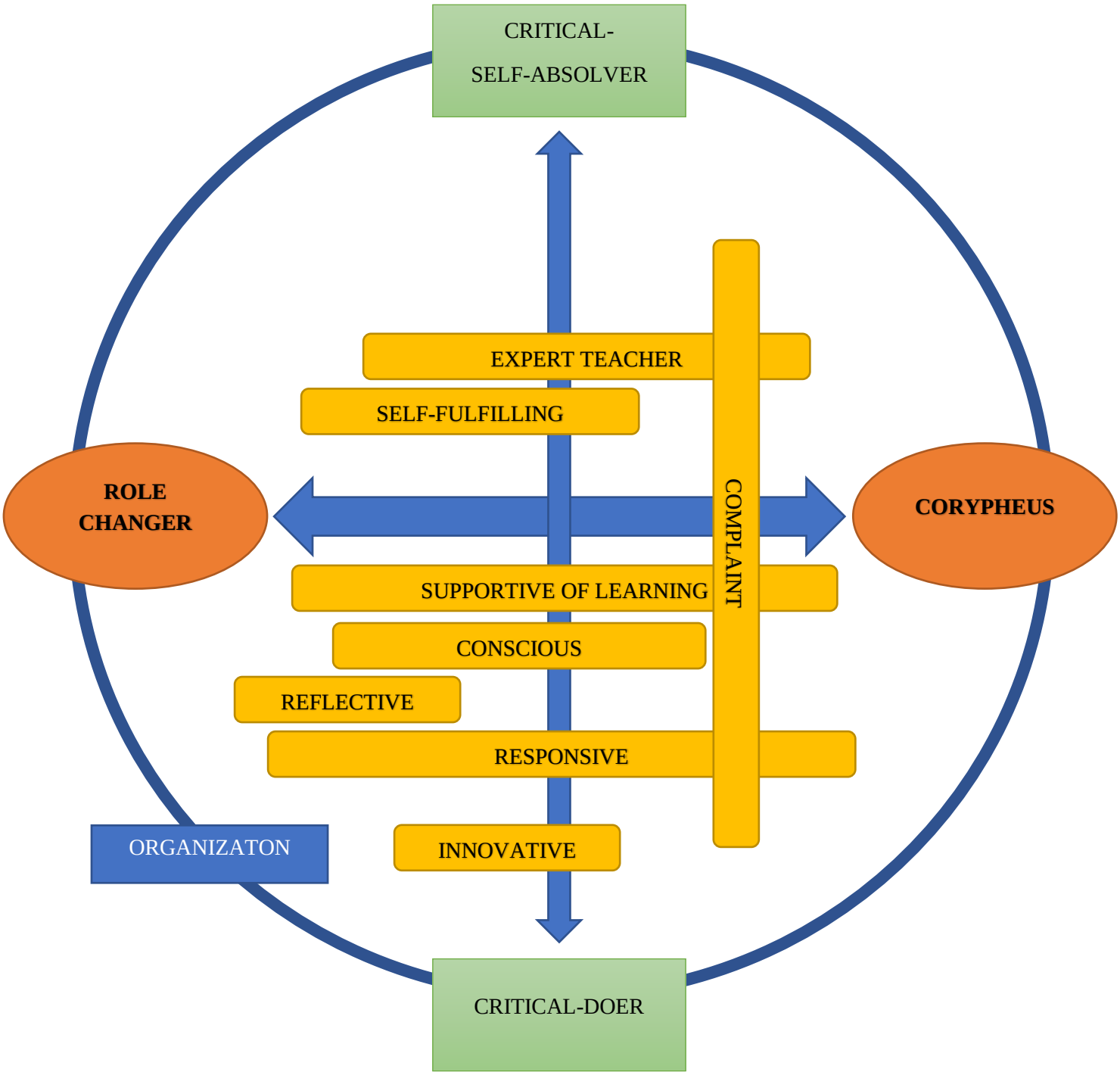

Figure 3. The explanatory model with two axes

Outlook

In our research, we sought to answer the question of what factors determine whether modern teaching and learning support methods appear in the practice of today's Hungarian schools, as well as in the practice of teachers teaching in these schools. We can answer this question based on the results of the three big empirical research: the quantitative data collection and the qualitative inquiry with a big sample

have resulted in a broad identification of those independent variables that strongly influence the presence of learning support in schools, as a dependent variable.

The results of the school study have revealed that the school type influences whether the modern methods of learning support are present in the school, and partly the kind of methods that are used. It seems that these are much less common in everyday pedagogical practice in an average school than in big schools, schools in the city, or in schools that are not publically maintained, often performing special tasks. It has also been revealed that although some kind of modern learning supporting methods is present in almost all schools, it acquires the definite profile beyond subject lessons and subject teaching only if it becomes part of the work with special need pupils. However, this also means that these procedures and methods are part of the pedagogical toolkit of highly qualified experts.

The results of the questionnaire research have revealed another essential structural factor: the effect of the differences between various subgroups of teachers that is independent of the differences between the schools. Teachers' education, the extent of their experience and the subject they teach have a significant impact on whether modern learning organisation procedures, learning methodology, learning support appear in their teaching activities. It is out of the scope of this research to conclude the relationship between the two independent structural factors. The data shows that in schools that are open to modern learning support, there are tendencies of teacher sub-groups to be more willing to use these methods. The analysis and explanation of this correlation require further investigation. Based on the analysis of the data collected in this research, we do not know a reasonable answer to the question of whether the schools whose activities, on the one hand, *are* likely to include modern learning supporting forms due to their structural characteristics are more attractive to those teacher sub-groups that, also due to their structural characteristics, are more susceptible to the use of such methods than other schools; and/or on the other hand the nature of the school simply incite opportunities for specific teacher sub-groups working in the school for developing their activities towards this direction. It would also be worth to examine whether the joint presence of the two factors have a longitudinal multiplication effect in schools where teachers open to the use of modern learning methods work, i.e. whether the presence and weight of these methods increase by time in teachers' activities in general.

The qualitative research with the teacher sample has revealed the third independent factor of the situation of learning support in schools. Analysing the interview materials with the methods of Grounded Theory has revealed that certain teacher attitudes and their co-occurance are closely related to whether the teachers use these methods. Those components of the pedagogical personality that enables or prevents the teacher from being open for such methods could be identified based on the text analysis. Further research is needed to reveal the factors causing or preventing these teacher attitudes: what is the effect of teacher education, continuous development, teacher collective, school organisation and – in a broader perspective – education and school policy, school- and teacher-related social expectations and norms.

The categories developed through the GT analysis can be considered as a solid basis for further research: the opposition of the ROLE CHANGER – CORYPHEUS teacher appears to be a usufel analytical aspect, and it might be worth elaborating on it in more depth. Moreover, it would also be worth inquiring on the CORYPHEUS characteristic with the characteristics and predictors of teacher burnout.

However, the conducted analysis is limited in the fact that it is based on teachers' self-reported data; therefore, it was not possible to compare the results we obtained with the actual teaching practice of the interviewees.

References

Charmaz, K. (2000): Grounded Theory Methodology: Objectivist and Constructivist Qualitative Methods. In: Denzin, N. K., Lincoln, Y (Eds). *Handbook of Qualitative Research* 2nd ed. (pp. 509-535), Thousand Oaks: Sage.

Corbin, J. & Strauss, A. (2015): *A kvalitatív kutatás alapjai* [Foundations of qualitative research]. Budapest: L'Harmattan.

D. Molnár Éva (2013): *Tudatos fejlődés. Az önszabályozott tanulás elmélete és gyakorlata* [Conscious development. Theory and practice of self-regulated learning]. Budapest: Akadémiai Kiadó.

Ehmann Bea (2002): *A szöveg mélyén. A pszichológiai tartalomelemzés* [In the depths of the text. Psychological content analysis]. Budapest: Új mandátum Könyvkiadó.

Forrás-Biró Aletta (2016, ed.): *A holokauszt, az iskola és a tanár. A holokauszt téma iskolai oktatása: helyzetelemzés és képzésfejlesztés* [The Holocaust, the school and the teacher. The Holocaust as a topic in school teaching: analysis és training development]. Budapest, Oktatáskutató és Fejlesztő Intézet. http://ofi.hu/sites/default/files/attachments/a_holokauszt_az_iskola_es_a_tanar_0.pdf Retrieved on 10.03.2019.

Forrás-Biró Aletta (2016): Pedagógusok a holokausztoktatásról. Iskolai tapasztalatok 100 mélyinterjú alapján [Teachers on the education of the Holocaust. School experiences based on 100 deep interviews]. In: Forrás-Biró Aletta (ed.): *A holokauszt, az iskola és a tanár. A holokauszt téma iskolai oktatása: helyzetelemzés és képzésfejlesztés* [The Holocaust, the school and the teacher. The Holocaust as a topic in school teaching: analysis és training development]. Budapest, Oktatáskutató és Fejlesztő Intézet. http://ofi.hu/sites/default/files/attachments/a_holokauszt_az_iskola_es_a_tanar_0.pdf Retrieved on 10.03.2019.

Forrás-Biró Aletta (2017): A tanulás tanulása és tanítása [Learning to learn and teaching to learn]. In: N. Kollár Katalin & Szabó Éva (eds.): *Pedagógusok pszichológiai kézikönyve 1* [Psychological handbook for teachers]. Budapest: Osiris Kiadó. 425-451.

Glaser, B.G. & Strauss, A.L. (1967): *The Discovery of Grounded Theory: Strategies for Qualitative Research.* Chicago: Aldine.

Hautamäki, J. & Kupiainen, S. (2014): Learning to learn in Finland. In: Crick, R. D., Stringher, C. & Ren, K. (eds.): *Learning to Learn: International perspectives from theory and practice*. New York: Routledge. 179-205.

Horváth Dóra & Mitev Ariel (2015): *Alternatív kvalitatív kutatási kézikönyv* [Handbook of alternative qualitative research]. Budapest: Alinea Kiadó.

Hoskins, B., Fredriksson, U. (2008): *Learning to Learn: What is it, and how can it be measured?* European Commission Joint Research Centre JRC46532 http://publications.jrc.ec.europa.eu/repository/bitstream/JRC46532/learning%20to%20learn%20what%20is%20it%20and%20can%20it%20be%20measured%20final.pdf Retrieved on 18.01.2019.

Kovács Zsuzsa (2009): Az önszabályozó tanulást támogató osztálytermi környezet sajátosságai. PhD értekezés [The characteristics of a self-regulated learning-supportive classroom environment. PhD dissertation]. http://www.ppk.elte.hu/file/kovacs_zsuzsa_disszertacio.pdf Retrieved on 03.03.2014.

Krippendorff, K. (1995): *A tartalomelemzés módszertanának alapjai* [Methodological foundations of content analysis]. Budapest: Balassi Kiadó.

Nahalka István (2002): *Hogyan alakul ki a tudás a gyerekekben?* [How does knowledge develop in children?] Budapest: Nemzeti Tankönyvkiadó.

Nahalka István (2013): Konstruktivizmus és nevelés [Constructivism and Education]. *Neveléstudomány*, 4. 21-33.

Nahalka István & Sipos Judit (2016): Az iskola eredményességével kapcsolatos nézetek [Views on school effectiveness]. In: Vámos Ágnes (ed.): *Tanuló pedagógusok és az iskola szakmai tőkéje* [Learning teachers and the professional capital of the school]. Budapest: ELTE Eötvös Kiadó. 37-56.

Sallay Viola (2015): Előszó a magyar kiadáshoz [Preface to the Hungarian edition]. In: Corbin, J. & Strauss, A.: *A kvalitatív kutatás alapjai* [The basics of qualitative research]. Budapest: L'Harmattan.

Szabolcs Éva (1996): Tartalomelemzés [Content analysis]. In: Falus Iván (ed.): *Bevezetés a pedagógiai kutatás módszereibe* [Introduction to methods of pedagogical research]. Budapest: Keraban Könyvkiadó. 330-339.