SWOT Assessment Usage in School Talent Management

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Abstract. Talent management is important part of human resource management in business world. There are two frequently used tools that supports talent management. DISC assessment is the leading personality assessment tool in the business world that helps improve work efficiency, team work, and workplace communication. SWOT analysis is a popular marketing tool that often use as personal develop tool. These can be particularly useful in talent development at secondary school. This research presents a possible application of the SWOT tools in secondary education. Beside the talent management SWOT can also use in formative assessment.

Keywords: SWOT analysis, formative assessment, talent management, digital competences

1.   Introduction

The talent management in the world of work is more productive than in education, so the application of the methods used in this field in industry can be especially useful at schools. Those methods can be used in public education that are commonly used, tried, and useful in business and industry.

The Human Resource department of bigger companies regularly select the talented employees and train them as a potential manager. After the selection the employees' skills are evaluated by the common used assessments. The results of these assessments point to what kind of skills should be developed. The most frequently applied tests are DISC and SWOT assessments in the business world. While DISC investigates the personality of people, SWOT focuses on the skills and potential of the tested persons. DISC assessment helps to find the proper position while SWOT highlights the strengths and weaknesses of the tested employee. Based on the results of these tests the specialists prepare a training and self-training plan to develop the potential manager.

School talent management requires a similar approach so it was examined how teachers can use these assessments in public education. This paper presents some sample usages of SWOT and the experiences of these assessments' usage at secondary school.

2. Concept and definition of SWOT analysis

SWOT analysis is well-known within the Hungarian public education system as well as in the business world. It mainly used for evaluation of curriculums or schools in education. The name SWOT is a mosaic word composed of the initials of Strengths, Weaknesses, Opportunities and Threats.

There is a debate between historians of science regarding the origin of SWOT. According to one concept, it was developed by George Albert Smith Jr. and C. Roland Christensen at Harvard University in the 1950s. Others state SWOT came from Albert Humphrey who worked at Stanford University since he was the first who published about SWOT. The Harvardians' work was continued by Kenneth Andrews and based on his lectures at the Harvard Business School SWOT became a known marketing tool. [1] [2]

The aim of the analysis is to position a product properly in the market. Strengths and weaknesses are internal factors that refer to the physical and financial characteristics of the product and the human resources behind it. Opportunities and threats from external factors such as economic and

market trends. At the end of the analysis, a proposal and a goal must be formulated, and the strategy necessary to achieve the goal must be found.

SWOT was first used in the 1960s, and the method has since proven much, so it has been used in more and more areas. The employee is the product that needs to be able to sell on the labour-market. So the human resource management staff, the company trainers, coaches and the head-hunters started to apply SWOT to employees as individuals as well. The result is an individual marketing plan that outlines the strategy of a personal development plan. [3][4]

3 Literature review

SWOT has a wide literature in marketing and human resource management, while there are only few papers regarding usage in education. The most of education related SWOT paper focuses on curriculum and institution evaluation. There is an interesting study from Thailand which investigated medical students by SWOT analysis. It searched to answer the question: Which students will become a dedicated well-educated doctor? The primary goal of the research was to explore the threats that result in students not being placed in a medical field after their graduating. Knowing the results, the curriculum was modified so that as many students as possible would take up the medical profession. [4][5]

4 Business tool at school

Pedagogy uses the achievements of psychology in many areas just like the human resource management and marketing in the world of work uses. Psychological tools are particularly useful when teachers work with non-average pupils especially in the case of talents. It is a well-known fact that the talents are usually 'odd', they require special communication and special care. Some are loud and disturb lessons, while others are retreating and quiet and they don't express their knowledge. Teachers' task to explore the hidden skills of pupils and teach them to utilize these skills. The presented assessments can help to implement these expectations, and these are well-known and proven in the world of work and a lot of experiences are available regarding their usage. The next trials show an example, a possible way of how can we use the demonstrated marketing tool within the public education.

4.1   Evaluation at school

Formative evaluation is still a novel method although it has been in the Hungarian literature for 20 years. Nowadays, of course, it is one of the most popular topics in both conferences and papers, despite these it is not used generally in practice.

The need for formative assessment is most often justified by continuous feedback and the importance of properly informing the learner. It allows individual students to better manage their time, their energy for learning, while it helps teachers recognize which topics need to be addressed more or to teach with new metaphors for better understanding. [6]

The most frequently used elements of formative assessment are the homework assignment, presentation, standardized tests, quizzes, oral question, or draft work. The ICT tools are particularly useful in the computer science subject and are being used by more and more teachers to support formative assessment (e.g. Kahoot, Redmenta, Learningapps.com, etc.) [7]

There is another aspect along the lines of formative and diagnostic evaluation. In addition to continuous information, it is important to involve pupils in the assessment. The evaluation builds on comparison and mathematical relations that improves pupils' mathematical competences as well as it also develops the ability to self-assess of students.

The importance of formative assessments is strengthened in the case of school talent management. The venue of talent management is usually study groups as well as specialization classes where the small groups provide a possibility to discuss evaluation aspects between the teacher and the pupils.

4.2 SWOT analysis as a tool for formative assessment

The classic SWOT analysis explores the internal and external factors of the given product. SWOT can be applied on workers in human resource management and career counselling to explore their strengths and weaknesses as they are 'sales products' on the labour market. Generally, internal factors are mainly the relevant skills from the point of view of a given job that are available in the job description. There is an analogy in the case of pupils, because they are also living persons who would like to achieve better results. On the other hand, there are some differences as they are not 'sales products' and their self-knowledge is not as developed as adults'. Pupils require a guidance for evaluating, especially self-assessment. The best solution is if we provide a group of predefined factors and the pupils' task is only responding.

First we need to specify the proper internal and external factors that we can apply on pupils at school. What kind of criteria can be the base of our assessment, what are the internal and external factors of students? After we defined the necessary factors pupils can start to get knowledge about SWOT. It is important to inform them about the concept and definition of SWOT and the main aims of analysis. The teacher has to introduce self-assessment to them, while pupils have to make a decision in the case of each factor, whether it is a strength or a weakness, an opportunity or a threat. This 'driven' SWOT can be repeated during the academic year to strengthen pupils' self-assessment skill and to help them become more familiar with SWOT analysis. As pupils and teacher evaluate these analyses they implement a special case of formative assessment. They can clarify goals, they can track development and this activity develops pupils' self-assessment skills.

4.3 Internal and external factors at school

We have decades of experience in competency measurements, and the areas of competence defined by the EU are a good starting point as internal factors. From the point of view of computer science subject, it is also good to start from the competencies, which are arranged in a hierarchical structure. The 8 key competencies are known to everyone (In some cases there are separated the mathematical and the science and technology competencies): [8]

- 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;

- Cultural awareness and expression.

Pupils can examine themselves by these competencies. Is the given competence their strength or weakness? They have to make decision; they need to practice their self-assessments by these factors. In terms of IT talent management these areas of general competences at the higher level cannot be neglected. Many IT talents have a hard time expressing themselves. The weaknesses of communication in the mother tongue still can be improved at secondary school. There are some international competitions in computer science where the talented students are also entered, so the knowledge of English language is required. It is a great loss if our best student cannot be named due to lack of language skills. Mathematical, Science and Technical competences are close to digital competence we refer those frequently as STEM (science, technology, engineering and mathematics). The areas of social and civic competences are also important and to be examined in terms of talent development, as well as the areas of competence of initiative, cultural awareness and learning ability.

The next step is a detailed investigation the components of relevant competence. The second level is no longer clear. There are several grouping of components in the case of digital competence. The European Commission has developed the European Digital Competence Framework for Citizens (DigComp) which is divided into five areas: information and data literacy; communication and collaboration; digital content creation; safety; and problem solving. [9] Another grouping is common used in Hungarian public education and it more fits to computer science subject. [8] This grouping divides digital competence to the next ten components:

- algorithmic thinking

- data modelling

- modelling the real world

- problem solving

- communication skills

- application skills

- team work, collaboration, interoperability

- creative skills

- orientation and information skills

- systemic thinking

Similar to first level of internal factors pupils have to make decision again. Is the given component of digital competence their strength or weakness? The result of this level can already provide several feedbacks to teacher. It informs about the interests of pupils. On the other hand, it provides feedback about the understanding of the given curriculum. Both help teachers to apply the proper differentiation in classroom. This is even more true for small group lessons where teacher can customize curriculum by pupil.

The result of this level, the components of digital competence allows us to continue our analysis in different ways based on the pupils' interests. It also helps the talent management as we analyse the pupils' interests and measure their strengths and weaknesses. There are three well defined areas of IT talent at secondary school: application, creative and programming.

The algorithmic thinking is a very strong base of programming so we expound on this component on the next hierarchical level.

- Recognising and Understanding Algorithms (a sequence of activities)
- Implementing Algorithms (a sequence of actions)
- Analysing Algorithms (a sequence of actions)
- Making Algorithms (a sequence of actions)
- Realising Algorithms (a sequence of actions)
- Modifying and Changing Algorithms (a sequence of actions)
- Designing Complex Algorithms (a sequence of actions)

The curriculum at secondary school doesn't allow the coverage all part of this level. Study groups and specialization classes provide possibility to practice programming, that requires the knowledge and applying of algorithms. Focus on implementing algorithmic element we go down to a new level. There are several directions to approach the specifications and levels of implementing algorithmic competence. Adapted to the curriculum of secondary school the following competences are relevant.

- Data types and data structures
- Concept and usage of variable
- Conditions
- Loops
- Patterns of algorithms
- The knowledge at least a programming language
- Value assignment (in the given language)
- File handling (in the given language)
- Functions and procedures (in the given language)
- Implement patterns of algorithms (in the given language)
- Implement recursive algorithms (in the given language)

The number of levels can vary per student and subject, as can the assessment criteria at each level. These assessment aspects themselves also help to formulate goals for both the pupils and the teachers.

The analysis is not complete yet, the previous criteria help to examine the internal factors, strengths and weaknesses. What are the external factors and how can we measure those? The external factors can be closely related to internal factors when analysing a person instead of a product. Opportunities can be related to strengths, while threats can be related to weaknesses. When the given competence is the strength of the pupil it is worth entering the competition, it is an opportunity. In the case of weakness, we have to improve the given competence of pupil to avoid threats.

There are other aspects to analyse external factors regardless competencies. The background and the environment of pupils are a real external factors. The next four categories can cover the most relevant external factors:

- School

- Social background

- Community

- Other external factors

The talent management provides some further interesting criteria that can be used for SWOT analysis. Czeizel extended Renzulli's talent model and defined his 2x4+1 factors model. [10] The main factors of this model are also interesting as an external and internal factors of SWOT.
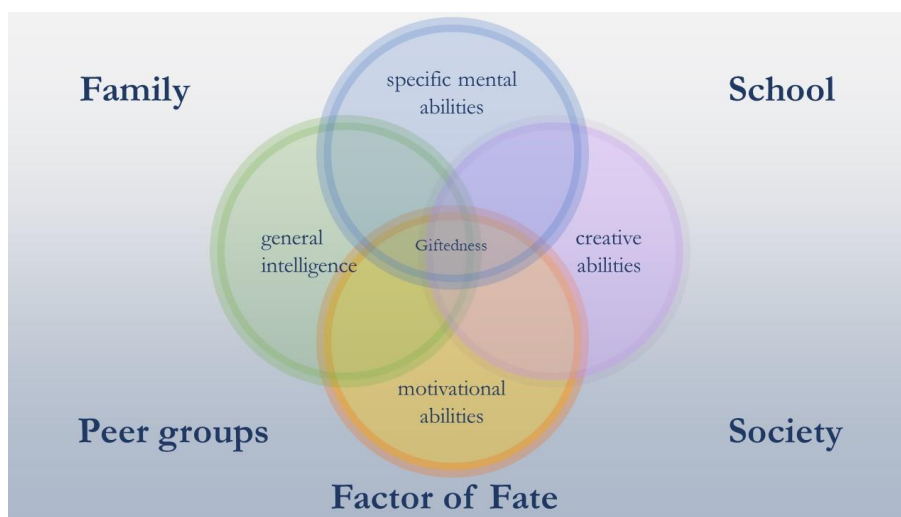

Figure 4: Czeizel's 2x4+1 factors talent model [10]

The internal factors are within the rings while the external factors are outside of rings on the chart. The intersection of internal factors refers to the possible talent. When a pupil is characterized by these presented internal factors we can suppose we found a possible talent. The four external factors can help or block to unfolding the given talent even just the additional fate factor. The teachers' scope is limited, it focuses on school and affects the peer groups as well partly the families. However, this scope can be enough to support the talented children at school. The benefit of SWOT analysis is that it helps detect the critical parts of external and internal factors.

There are well-known strategic models developed during the decades of practice in the literature of SWOT analyses. These models can also be transferred to school evaluation, especially in formative evaluation with a feedback and regulatory function. The four basic strategies come from the letter pairs written in the combined SWOT matrix. The figure 5 summarizes these basis strategies that can also be applied in school talent management.

	Strengths	**Weaknesses**
Opportunities	SO strategies Leverage strengths to maximize opportunities Attacking strategy	WO strategies Counter weaknesses through exploiting opportunities Build strengths for attacking strategy
Threats	ST strategies Leverage strengths to minimize threats Deffensive strategy	WT strategies Counter weaknesses and threats Build strengths for defensive strategy

Figure 5: SWOT basic strategies

- S-O Strategy: Offensive Strategy - Exploiting opportunities through strengths

- W-O strategy: Crisis-oriented strategy - Overcoming weaknesses by seizing opportunities

- S-T Strategy: Diversified Strategy - Defending Against Threats Using Strengths

- W-T Strategy: Defensive Strategy - Strategy that protects against the threat targeted to weaknesses

Choosing the right strategy together with the pupil is another way to engage students in assessment. It helps develop the students' analytical skills. At the same time, the teacher's pedagogical sense and experience are needed for the chosen strategy to contribute to the pupil's development. When some pupils recognize their weaknesses they cannot make a decision which strategy should be applied to develop themselves. Teacher has to help whether to start defensive strategy or develop as many areas as possible, or to focus on some strengths with offensive strategy. The decision also depends on the personality of the particular pupil. These difficulties affect all pupils regardless of their skills and marks.

The formative nature of the evaluation is strengthened by the repeating of SWOT analysis following the application of a strategy. We can try another strategy or can continue the selected one based on the new results. The pupils should be being involved both parts of SWOT, not only in the evaluative part of the analysis, but also in the selection of strategy, when we precise formulation of the learning goals.

4.4 Classroom examples of using SWOT analysis

SWOT analysis was tested within my classes several times. [7] The pupils of first sample group were graduate students of a small IT specialization group. They filled out a spreadsheet only about their internal factors. The evaluation pointed out which parts of curriculum requires more focus during the education. The pupils were confident on the level of key competencies, but they thought the 'designing complex algorithms' is their weakness. Examining individual pupils more weaknesses were recognized. It has already matched better to the teacher's evaluation. These internal factors were the following: The 'data modelling', the 'modelling the real world' and the 'systemic thinking' between the 'digital competences', while the 'making algorithms', the 'realising algorithms' and the 'designing complex algorithms' on the 'details of algorithmic thinking' level. The group-level results identified the teaching goals, what topics need to be practiced even more.

The individual-level results should be discussed pupil by pupil. The most of talented pupils are unaware with their talents while some other think themselves even more talented. SWOT analysis and the personal discussion about the results helped to clarify the actual level of skills. Teacher and pupil can discuss and mark together the areas that should be developed. The differs are reduced between the evaluation of teacher and pupils during the repetition of analysis, so SWOT helped develop pupils' self-assessment. The pupils from this group achieved a good graduation result and they were admitted to IT faculty of University. [7]

A new extended form was created based on the first experiences that contains more internal factors and it already contains external factors too. The aspects for internal factors compound from the well-known competences. The external factors based on the social background of Czeizel's talent model. [10] The form is available via internet and the results are stored in a database. There were examined two IT specialization groups from 10 and 11 school years.

The first step was the fill out the form. The prepared webpage displayed the aspects of internal and external factors and the pupils had to select the strength or the weakness and the opportunity or the threat row by row.

The examined internal factors are the following:

Internal Factors
Key Competencies - Communication
Speaking skill in native language
Reading, writing and comprehension (traditional)
Reading and comprehension (digital)
Typing
Foreign language skill
Key Competence - Mathematical competence and basic competences in science and technology
Arithmetic skill (fractions, percentages)
Geometry skill
Comparison, estimation
Mathematical rule recognition
Combinatorics, probability and computing
Numeral systems, binary numbers
Mathematical reasoning, writing and proof
Science (physics, chemistry, biology)
Technology, usage and theory
Key Competence - Learning to learn and social and civic competences
Skill of perseverance in learning
Awareness of the learning process, conscious learning
Organizing learning
Self-control
Note-taking
Scheduling
Intrinsic motivation
Skill of self-checking
Critical thinking
Cooperative learning
Integration into the community
Adaption to school

Key Competence - Digital competence
Algorithmic thinking
Data modelling
Modelling the real world
Problem solving
Communication skills
Application skills
Team work, collaboration, interoperability
Creative skills
Orientation and information skills
Systemic thinking
Details of algorithmic thinking
Recognising and Understanding Algorithms (a sequence of activities)
Implementing Algorithms (a sequence of actions)
Analysing Algorithms (a sequence of actions)
Making Algorithms (a sequence of actions)
Realising Algorithms (a sequence of actions)
Modifying and Changing Algorithms (a sequence of actions)
Designing Complex Algorithms (a sequence of actions)
Details of Implementing Algorithms
Data types and data structures
Concept of variable, variables, assign value
Conditional, logical expression
Loops
Patterns of algorithms
Knowledge of at least one programming language
Handling of variables, assignment, input
File handling
Functions and procedures
Implementation of patterns of algorithms
Implementation of recursive of algorithms

Table 10: Internal factors of SWOT

The examined external factors are as follows:

External factors
School
Teachers' knowledge
Teachers' humanity
Consultation with teachers
Study group, tutoring
Competition
Library
Study room
Backrgound
Family
Social background
Socio-economic status
Financial background
Own computer
Community
Classmates
Friends
Teachers
Parents
Relationship (friend, girlfriend)

Other
Freedom close to adulthood
Relax, entertainment
Trend and fashion
External motivation
Health (mental health)
Commute
Sports

Table 11: External factors of SWOT

The evaluation started with the comparison of pupils' marks and their strengths and weaknesses. While on the highest level of competencies there is not any discrepancy between teachers' and pupils' evaluation, there are differs on the deeper levels. These differs are important feedback for teachers. On the one hand, it provides feedback about pupils' self-assessment skills, so it implements one of the aims of formative assessment. On the other hand, it presents the understanding level of each topic from the given subject, so it implements another one aim of formative assessment.

SWOT analysis provides feedback to pupils too. When they evaluate the components of competencies as an internal factor they can recognize what are the most important competences to be acquired. The repetition of SWOT analysis a few months later helps improve pupils' self-assessment skills.

First let's see the aggregated internal factors. Each strength means one and each weakness means minus one. The serious weaknesses are important feedback to teachers, these competencies should be improved. Some of those belongs to computer science subject, so it defines our next task with the given group. Some others weaknesses belong to other subject and other teachers, so these should be discussed with colleagues.
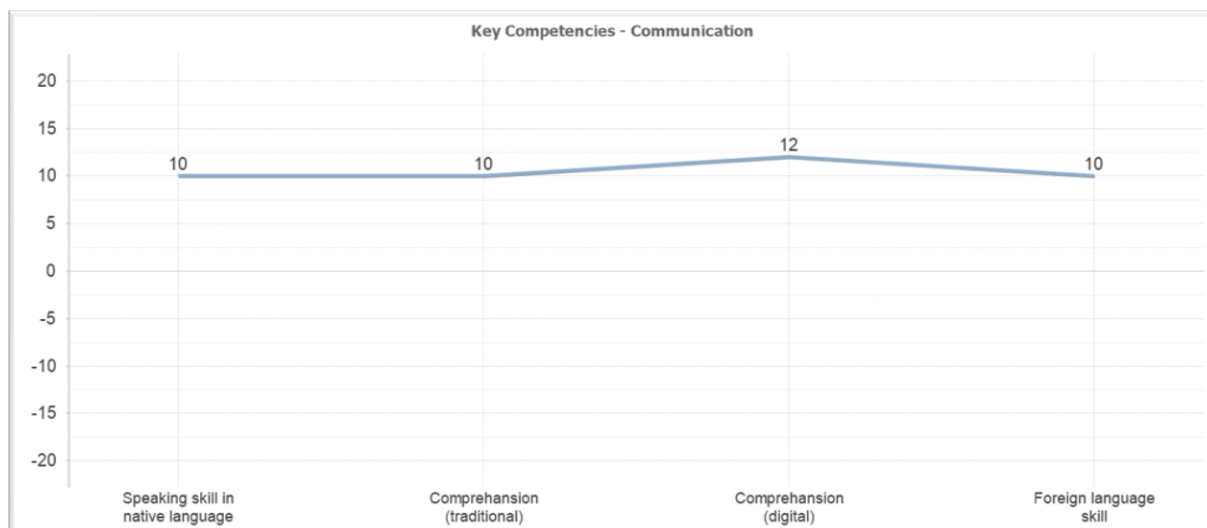
Figure 6: Key Competencies - Communication

The first group of internal factors are related to native and foreign language competences. The reading-writing and comprehension were divided two parts by the format, because there can be differences between paper-based and digital reading and comprehension based on the assessments. [11] In the case of the examined group typing skill was significantly low. It was confirmed by other examined groups so we inserted some typing lessons into the curriculum.
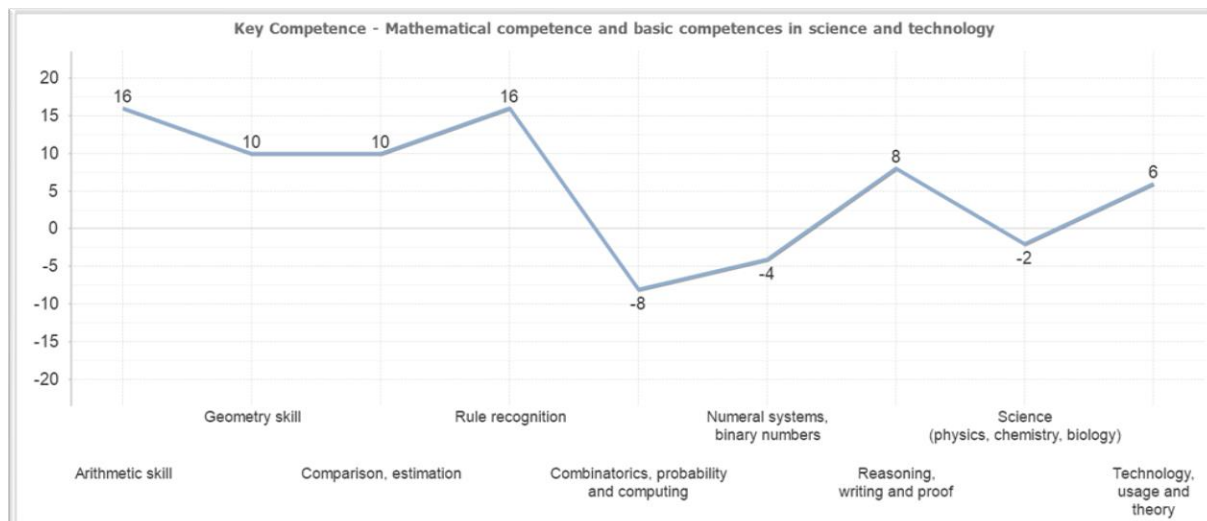
Figure 7: Key Competencies - STEM

The STEM skills were weaker. The combinatorics, probability and computing are new at secondary school, it is reasonable that pupils need more practice. The low level of science skills reflects to curriculum that reduced the number of science lessons in the last couple of years. There is no reasonable explanation for the low level of numeral systems and binary numbers knowledge. It was an important feedback of SWOT analysis.
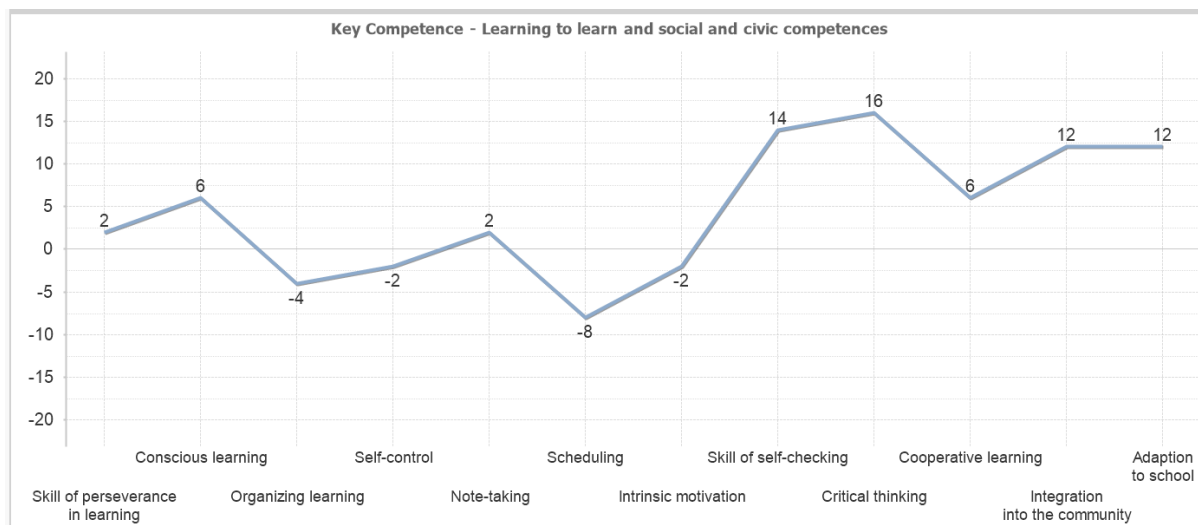

**Figure 8**: Key Competencies – Learning to learn and social competences

The examination of learning to learn and social competencies are new internal factors that were not investigate last year. There are four factors under zero. The weakness of scheduling, self-control and the organizing learning are age-specific, they have to develop these skills if they would like to go to University. The lack of intrinsic motivation made me think. Would that be burnout? The lessons need to be made much more interesting and the practices require more interesting tasks. Lack of motivation doesn't affect only IT lessons, however it confusing in the case of IT specialization group.
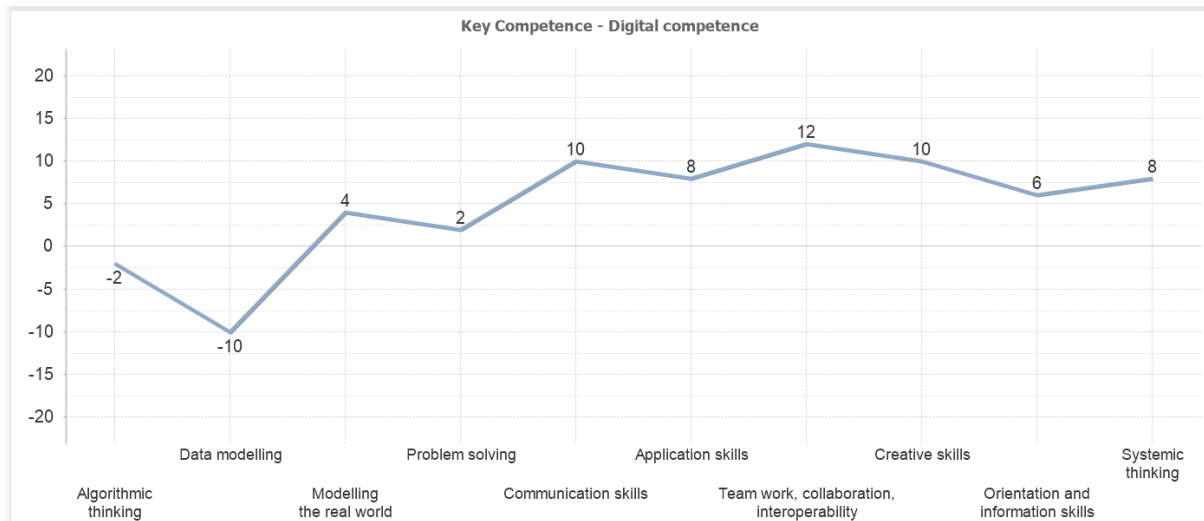
**Figure 9**: Key Competencies – Digital competences

The components of digital competencies are well-known within the group and the pupils' evaluation were close to teacher's opinion. The differs were at the negative values and these came from the pupils evaluated their skills to weaker than teacher thought. Based on the experience of the task solution the pupils recognized their weaknesses regarding algorithmic thinking and data modelling. In this special case in addition to further practice pupils also need more time to deepen their knowledge.

After the evaluation of general competences, the examination of internal factors focusses on computer science. A selected competence component was examined using the drill-down method as a next step. The 'algorithmic thinking' is an important base of programming that is the aim of this course, therefore, we chose this for deeper analysis.
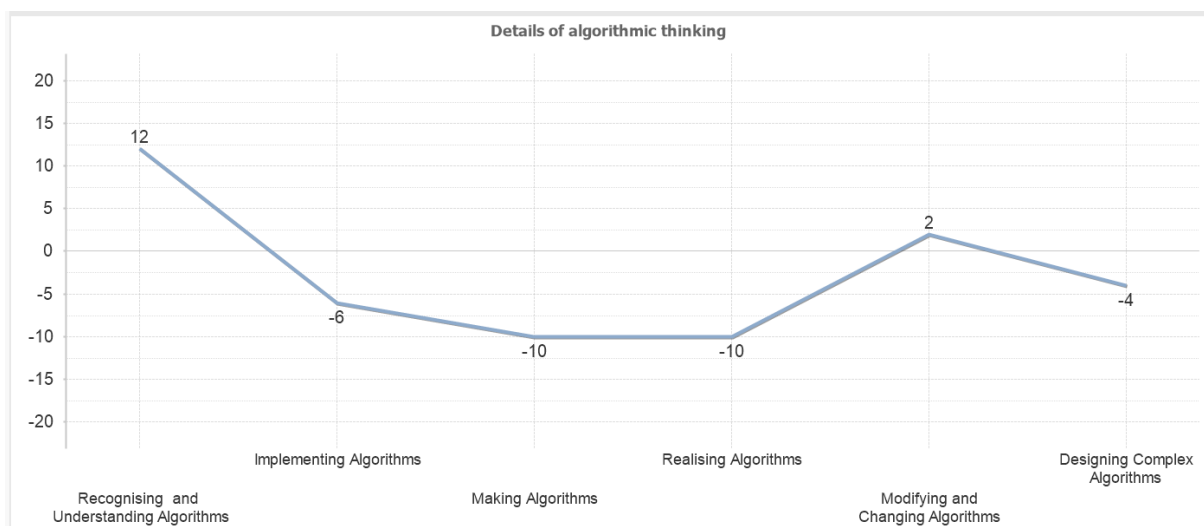
Figure 10: Details of Algorithmic thinking

Similar to previous level the less-known and less-practised topics were evaluated to even neutral and the well-known and well-practised topics were evaluated to weaker. The most frequently practiced part is the implementing algorithms and this component is not a major weakness based on the teacher's evaluation. The making algorithms and realising algorithms are also well-practiced components and the analysis pointed out the importance of developing these parts.
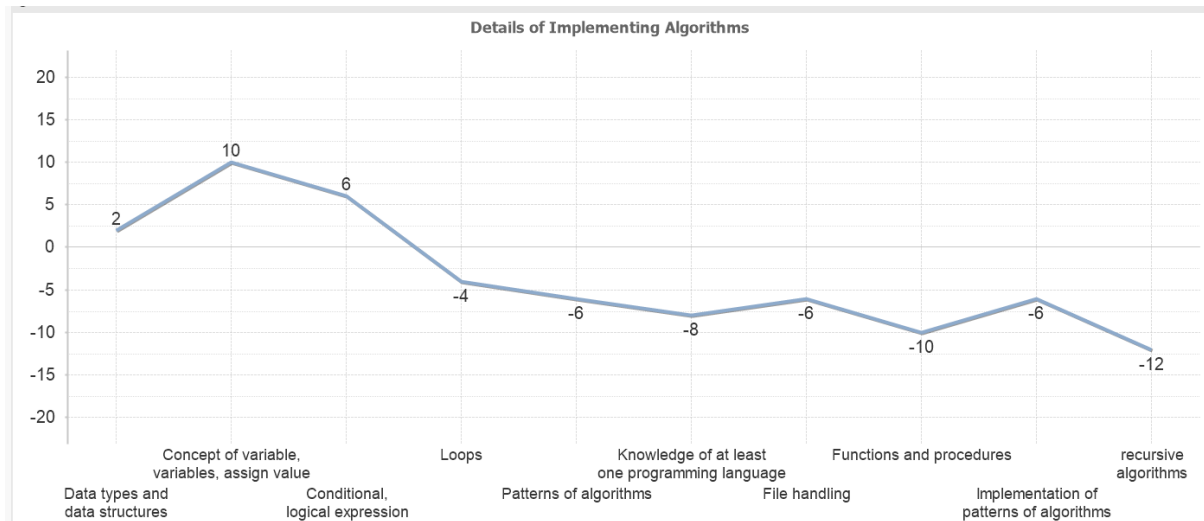
Figure 11: Details of Implementing Algorithms

The details of 'implementing algorithms' is the deepest level that contains elementary simple to knows. The concept of loops is well-known similar to conditional and logical expression. Behind the weaknesses are the differences between the different kind of loops, that are not so clear for the given group. It affects other components, like patterns of algorithms and implementation of patterns of algorithms as the pupils often mix the required loops during implementation of algorithm patterns. It also affects to knowledge of at least one programming language and file handling as these use different kind of loops. This is again a well-defined area that the teacher has to teach better. The question about the recursive algorithm is a control point. We haven't learnt about it yet. It was set as strengths by two pupils who learnt about it at summer camp.

The external factors are not so interesting on the group level except for some questions. The pupils were satisfied with their school background and their family background, these contain opportunities rather than threats. However, owning a computer is a threat rather than an opportunity as the online virtual world is stealing their time. The community around the pupils is also supportive. However, most of the pupils thought the relationship (between a boy and a girl) is a threat, similar to own computer, and the time requirement is the reason for this. Pupils thought they can manage their downtime, entertainment and the increased freedom. But they thought the influence of trends and fashion are threats. The last external factor that provides threat is the commute. The study group classes are usually late in afternoon and it is a threat to commitment.

The previous analysis helps the teacher to improve their teaching process as well as it helps pupils recognize the details of requirements. The personal level of SWOT provides useful support to talent management as it allows to customize curriculum. It cannot be implemented within a standard class, but it can be implemented within study group. The personal discussion is a good possibility to clarify real strengths and weaknesses as well the real opportunities and threats. At the end of this kind of discussion the teacher and pupil can define together the goals for the next period.
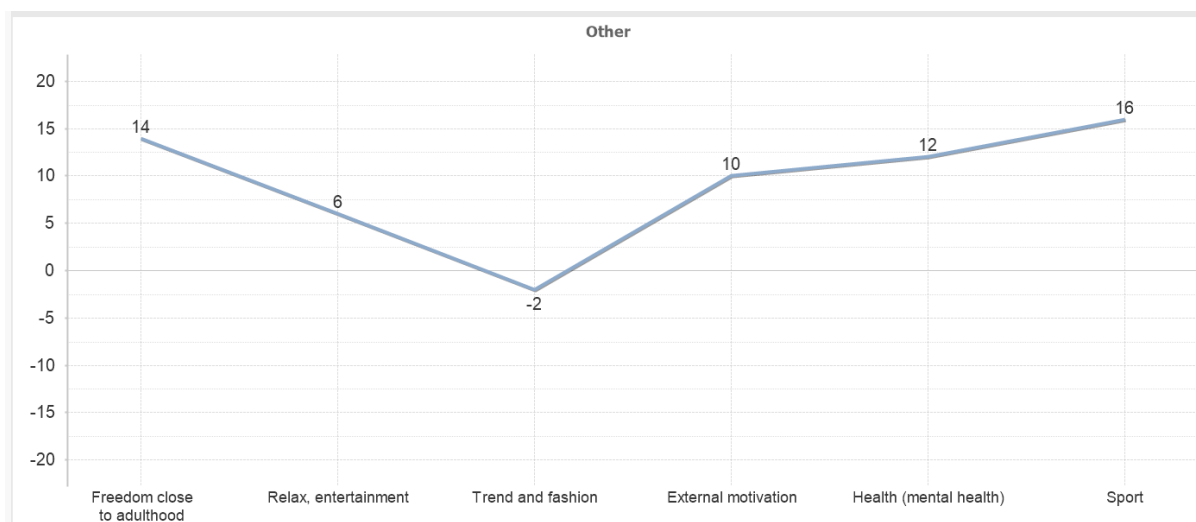
Figure 12: Other external factors

The following table contains a pupil's SWOT:

Internal factors	
Key Competencies – Communication	
Speaking skill in native language	1
Comprehension (traditional)	1
Comprehension (digital)	1
Typing	-1
Foreign language skill	1
Key Competence - Mathematical competence and basic competences in science and technology	
Arithmetic skill, fractions, percentages	1
Geometry skill	1
Comparison, estimation	1
Mathematical rule recognition	1
Combinatorics, probability and computing	-1
Numeral systems, binary numbers	1
Mathematical reasoning, writing and proof	1
Science (physics, chemistry, biology)	-1
Technology, usage and theory	1
Key Competence - Learning to learn and social and civic competences	
Skill of perseverance in learning	1
Awareness of the learning process, conscious learning	1
Organizing learning	1
Self-control	1
Note-taking	1
Scheduling	-1
Intrinsic motivation	1
Skill of self-checking	1
Critical thinking	1
Cooperative learning	1
Integration into the community	1
Adaption to school	1

Table 12: General competencies of a pupil

According to the analysis, the selected pupil has good opportunities. His general education and intelligence are outstanding, he enjoys IT and has a strong basis. The typing skill can be developed by practices and he received a link to a site with online typing lessons. He was informed during the

discussion about the importance of mathematical and science skills and his teachers were also involved to his development. The scheduling is not an easy question, he received some suggestions like he should create weekly and daily agendas that he has to check regularly. The second SWOT helps to check the improvement a few months later.

Key Competence - Digital competence	
Algorithmic thinking	-1
Data modelling	-1
Modelling the real world	1
Problem solving	-1
Communication skills	1
Application skills	1
Team work, collaboration, interoperability	1
Creative skills	1
Orientation and information skills	1
Systemic thinking	1
Details of algorithmic thinking	
Recognising and Understanding Algorithms (a sequence of activities)	1
Implementing Algorithms (a sequence of actions)	1
Analysing Algorithms (a sequence of actions)	-1
Making Algorithms (a sequence of actions)	-1
Realising Algorithms (a sequence of actions)	-1
Modifying and Changing Algorithms (a sequence of actions)	-1
Designing Complex Algorithms (a sequence of actions)	-1
Details of Implementing Algorithms	
Data types and data structures	-1
Concept of variable, variables, assign value	1
Conditional, logical expression	1
Loops	-1
Patterns of algorithms	-1
Knowledge of at least one programming language	-1
Handling of variables, assignment, input	1
File handling	1
Functions and procedures	1
Implementation of patterns of algorithms	1
Implementation of recursive of algorithms	-1

Table 13: Digital competencies of a pupil

The personal discussion between the teacher and pupil helped to clarify the internal factors of digital competences. The data modelling was a real weakness, while algorithmic thinking and problem solving were close to strengths. The given pupil understands the algorithms and he can implement those in C++ environment. The clarified goals are the practicing of analysis and changing of algorithms.

There were some differences between teacher's evaluation and pupil's evaluation on the deepest level that was clarified during personal discussion. The pupil knows the necessary data types and data structures and he handles these in C++ environment. The teacher's suggested a table creation that contains loop types and loop indexing by pattern of algorithm. The fulfilment of defined goals should be checked via repeated SWOT a few months later.

External factors	
School	
Teachers' knowledge	1
Teachers' humanity	1
Consultation with teachers	-1
Study group, tutoring	-1
Competition	1
Library	1
Study room	-1
Backgound	
Family	1
Social background	1
Socio-economic status	1
Financial background	1
Own computer	1
Community	
Classmates	1
Friends	1
Teachers	1
Parents	1
Relationship (friend, girlfriend)	1
Other	
Freedom close to adulthood	1
Relax, entertainment	1
Trend and fashion	1
External motivation	1
Health (mental health)	1
Commute	-1
Sports	1

Table 14: External factors of a pupil

The external factors contained some threats that should be avoided. It became clear during the personal discussion that there is only one real threat: commute. The pupil has to go home from the school before he can talk with the teacher and he cannot join prepare sessions for competition. As the given pupil is motivated and he has a good chance in competitions the teacher proposed an online preparation for him. It is a good example of applying different strategies. The suggestions contained an S-O strategy as built on the strengths that exploit opportunities, while a W-T strategy as it protected from the threats that target its weaknesses. The focus on the customized personal strategy is what supports talent management at secondary school.

The above presented analysis and the repeating of SWOT analysis is a good method for applying formative assessment. The predefined internal and external factors can be changed depend on the examined pupils. There are two kind of IT study groups at the examined school. The presented internal factors help the analysing the pupils of programmer group. The other study group focuses on creative component of digital competencies, the pupils study vector graphics and raster graphics applications. In this case the drill-down to details of digital components uses other questions to explore internal factors. In this case the survey analyses the creative skills part of digital component on different levels.

This SWOT analysis also was tested at an IT department of University where it examined freshmen during the first semester. The applied internal factors were same as used at programmer study group, while the external factors were specified to freshmen. There are more possible threats in this special age when students start their study at university parallel they enter to adult age. SWOT

helps them recognize several threats and the discussion with a mentor can help to explore opportunities and some relevant strategies.

5. Conclusion

The above presented SWOT analysis with DISC assessment [12] are mutually supportive in school talent management as well education in general. Both methods are very useful tools for both parties at public education. These are deservedly commonly used assessments in human resource development in the business world and these methods works at secondary school too, especially in talent management. While SWOT analysis helps detect strengths, weaknesses, opportunities and threats and assists to find necessary strategy, DISC helps the teacher select the proper communication based on the given pupil's personality.

SWOT analysis provides feedback on the success of teaching that is important from the teachers' point of view. On the other hand, it helps to clarify the curriculum to be learned for pupils and the multiple implemented analyses develop the pupils' self-assessment skill. It should be noted that the SWOT result depend on pupils' decision at a given moment. For the right evaluation require a personal discussion between the teacher and pupil. Personal communication does miracles usually.

In addition, the school environment provides possibility of long term observation of pupils. While psychologists or talent experts examine test results, mark and meet with pupils only few times, the teacher meets with them every week. The classroom work, the regular test, homework and the repetition of SWOT assessments allows the teacher a deeper observation and get detailed and confirmed information about pupils.

Talent management is not new within the education, however it is outdated, while it is more modern in the business world. These assessments are regularly used in human resource management and corporate talent management programs [13][14]. However, it is not really used within public education, meanwhile the school talent management is the exact environment where these assessments could be used efficiently. It has to be noted these assessments support talent management rather than talent search and talent recognition.

SWOT analysis is a good complement of DISC assessment in the case of talent management. Similar to company talent management, the selected pupils have to create a SWOT analysis together with their teacher. The common personal analysis helps to recognize and understand for both side the real strengths and weaknesses of a given pupil. SWOT can also be part of common used portfolio assessment; it is a good complement of its. Based on the SWOT result the teacher can provide a personal coaching to pupil that can reduce weaknesses and improve strengths. The young talents require the customized attention and care. The teacher task regarding the talent management can be supported by tutor and mentor. SWOT analyses as well DISC assessment provide the necessary inputs to the team that develop the talented pupils. This special process is called coaching in the business world and it should be spread at secondary school.

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