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Students' Self-Assessment and Self-Regulated Learning in Different Age Categories

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Abstract Life-long learning is crucial for present and future generations to manage their life and to build their professional career. Self-regulated learning supported by Self-assessment has a big potential in educational research. The article presents the results of a longitudinal action-research focusing on the triangle of students' Self-assessment, Self-efficacy perception and Teacher's assessment in the context of Self-regulated learning. The research goal was to examine how these notions relate to each other, how their interrelations change if the students do Self-assessment on a regular basis, and furthermore, to integrate research results into teacher education in the didactic field of formative assessment. We carried out the research in the mixed paradigm in two cohorts of students (high-school EFL students and student teachers doing their individual long-term practice). Although we examined two target groups in different learning contexts supported with different self-assessment tools, our research resulted in high importance related to teaching practice. They show that being an autonomous reflective learner does not depend on age. Furthermore, we identified different patterns of Self-assessment-Self-efficacy perception. According to our results, regular Self-assessment contributes to identifying participants' strengths and weaknesses, but they do not always form their learning goals based on this identification process. The newly developed Self-assessment measuring tools and methodological implications also deserve consideration in teaching practice. Being an action research, it has its limitations in terms of the size of the samples and generalizing the results; however, these types of longitudinal interventions are rare because they need time and deep professional involvement in the research process.

Keywords Self-Assessment, Self-Regulated Learning, Self-Efficacy, Teaching Practice

1. Introduction

The concept of life-long learning, which envisions learners responsible for their own learning, takes priority in the strategic documents of the European Union [1, 2]. These documents serve as a base for national curricula [3]. Experiences gained during the pandemic caused by Covid-19 also contributed to the growing importance of Self-regulated learning (SRL) [4-7]. Research conducted at this time underpins the deficiencies of students' SRL. The third source of the research problem is our research interest focusing on the role of Self-assessment (SA) in SRL. Working as a practicing teacher at a high school teaching English as a foreign language and mentoring student teachers during their individual long-term school practice, we realized that both high school students and student teachers need professional assistance for their SA and SRL.

In order to develop the students' (high-school students and student teachers) SRL, we opted for applying SA on a regular basis. We realized the intervention in the frame of an action research using a mixed-method research strategy. The basic conceptions of the theoretical frame are Self-regulated learning, Self-assessment and Self-efficacy perception. We also introduced two SA tools, which we applied regularly in the process of intervention. After

providing a theoretical base for the action research, we present the results and conceptualize them. Finally, we give the limitations of the research and highlight certain aspects worth considering for future research.

The longitudinal action research combines two sub-researches from the field of pedagogical practice. We conducted them at the same venue focusing on two target groups. The research brings a new perspective to SA studies because former studies have a profile of cross-sectional character.

2. Theoretical Frame

Self-regulated learning is a process through which the learner led by his inner, personal goals regulates his cognitive, metacognitive, motivational and behavioral processes. The learner uses complex cognitive, emotional and behavioral skills in the processes of regulation [8]. McCombs and Marzano [9] conceptualize SRL as a fusion of self-directed metacognitive, affective and behavioral processes. According to Winne and Perry [10], self-regulation means that learning is metacognitively guided, at least partly intrinsically motivated and strategic. They conceptualize self-regulation as an aptitude and an event.

Panadero uses SRL as a powerful umbrella term, which includes all cognitive, metacognitive, behavioral, motivational and emotional aspects of learning, and therefore learning processes can be formulated by numerous factors (self-efficacy, effort regulation, procrastination) that influence academic performance [11]. Analyzing the models of SRL, Panadero concludes that SRL is a cyclical process where different phases and sub-processes are shifting. Certain models of SRL make clear distinctions between three phases: forethought (analyzing the task, planning, goal setting, planning how to reach them), performance (executing the task, while monitoring how students are progressing, and self-reflection (assessing how the task has been performed, making attributions about success or failure and adaptation (Zimmerman and Pintrich's model). Other models conceptualize SRL as an open process with repeating phases not clearly separated from one another (Winne and Hadwin's, Boekaerts', and Efklides' models). All these models confirm that feedback plays a crucial role and it is often connected to forming a judgement (evaluation).

Various studies have supported the role of SA [12-15]. According to them, SRL can be achieved when students set learning goals and monitor their thoughts, emotions and behaviors, reflecting on their original goals. This process includes making judgements and modifying students' actions accordingly if needed. SA is an essential component of SRL and examining its role in developing SRL has great potential for researchers and for practicing teachers [16].

We should consider different approaches when we define the notion of SA [17]. In the past, scholars identified SA as knowledge and a collection of beliefs with the help of which a student can assess his own knowledge. On the other hand, SA is also defined as a method of formative assessment [18-21]. According to this approach, SA combines two main components: defining the criteria of students' performance and then judging the quality of the performance [17]. We can do Self-assessment in three steps. First, we form the criteria for the task performance. Then, we assess task performance individually based on the criteria. Finally, we review the performance based on the feedback made during the process of learning, reviewing the "product" of learning, and that of "production" [22]. Defining SA as a method leads us to its role in SRL. According to this approach, SA is a function in this context and it contributes to improving the quality of learning. The learner applies different strategies to keep his thoughts, behavior, emotions, and motivations under control in order to achieve his learning goals [23]. From this point of view, SA is a process with the help of which students regulate their own learning processes.

We can see from the research that scholars can define SA as knowledge, an instructional method of formative assessment and a function supporting SRL. We do not argue against defining SA as knowledge or a method but we focus on its role in SRL in this research; therefore we use this term to describe it as a function supporting the quality of SRL.

Effective SRL requires a motivational agent and it is Self-efficacy beliefs/conceptions [24-26]. Self-efficacy is an individual's perceived capabilities to attain designated types of performance and achieve specific results [27]. Zimmerman, Bandura and Martinez-Pons [28] make distinctions between two types of beliefs: Self-efficacy beliefs/conceptions for academic achievement and those for Self-regulated learning. In their point of view, the latter has a positive impact on Self-efficacy beliefs/conceptions for academic achievement. According to the research results by Zimmerman and Bandura [29], student teachers' self-efficacy beliefs for self-regulation influence their self-efficacy beliefs for their achievement in writing skills development in a positive way. These two types of beliefs have a positive impact on their setting learning goals and the prediction of their final grades. Positive correlations between self-efficacy beliefs/conceptions and academic achievements were justified by other researchers [30-32]. We also have to mention research results according to which students with higher Self-efficacy perception are more committed to studying harder [33-35].

There is a wide range of methods, which can support students' SA. Two of them need consideration in the context of our research. The first one is rubrics, which are a coherent system of indicators showing the stages of development [36]. Rubrics contain quality indicators showing progressions. Students use them to fit various aspects of their work with the help of these indicators [37].

The main advantage of rubrics is that they support student's learning. Many scholars making it a research field of SA discuss all benefits and drawbacks of rubrics, and relevant methodological implications [37-42]. The other tool of SA is self-estimates of performance on formal assessments. This method includes marking or grading one's own work using either a marking guide for objectively answered questions or a model answer [43]. The application of these two SA tools makes students deeply engaged in the processes related to self-regulation (i.e., goal setting, self-monitoring, and evaluation against valid, objective standards); consequently they contribute to increased self-regulation of learning [44, 45]. On the other hand, applying these two methods requires teacher' s assistance by using models, answers, and giving feedback to guide self-assessment judgments; this way it generally improves performance [46, 47].

By analyzing scientific literature, we identified two gaps in academic research. In case of high-school students, it is the interrelationships of their SA, Self-efficacy beliefs/conceptions and Teacher's assessment, the role of these interrelationships in SRL and the role of SA in the classroom environment. In case of the student teachers doing their long-term individual school practice, the research gap is their conceptualization of SA, their SA and applying SA in their teaching practice.

To close the gap, we conducted a longitudinal action research characterized by the following features:

- it originates from a problem of pedagogical practice,
- it reflects on it and returns to the problem,
- the research is carried out by those who are involved,
- there is a dialogue between the participants,
- the research takes several cycles the ending of which is the starting point of a new cycle, and it is based on the clear definition of constructs and relevant methodology,
- the results are justified by empirical data [48].

The research questions related to the high school students' Self-assessment, Self-efficacy perception and Self-regulated learning were:

- How do students' Self- efficacy perceptions change if they carry out SA regularly in the field of writing and speaking skills development in the process of learning English as a foreign language?
- How does students' SA change if they carry out SA regularly in the field of writing and speaking skills development in the process of learning English as a foreign language?
- What interrelations are there among students' Self-efficacy perceptions, SA and Teacher's assessment in the field of writing and speaking skills development of English as a foreign language?

The research questions related to the student teachers' SA were:

- How do student teachers conceptualize the notion of SA?
- How does student teachers' SA change due to the regular use of SA during their long-term individual school practice?
- How does student teachers' SRL change due to the regular use of SA?
- What changes can we identify in student teachers' classroom assessment practice due to the regular use of SA?

3. Materials and Methods

Within the frame of a longitudinal action research, we applied a mixed method combining quantitative and qualitative phases. The results are based on data gained from pre- and posttests, and SA tools applied during the process of development (high-school students – rubrics; student teachers – self-assessment sheets). The measurement tools included questionnaires (entry and follow-up in case of high-school students), semi-structured interviews and document analysis.

The questionnaire to measure high-school students' Self-efficacy perceptions was applied at the beginning and at the end of the intervention. The questionnaire consisted of 32 items measuring students' Self-efficacy perceptions generally in the fields of reading (9 items), listening (7 items), speaking (6 items) and writing skills development (10 items). Wang et al. [49] developed these items. We added 10 items measuring students' Self-efficacy perception, referring especially to their writing skills and their self-regulation in the field of writing skills development. Content validity was provided by the fact that we based the constructs on the contents described in scientific literature and the inner coherence of the scales (items referring to general Self-efficacy perception - Cronbach-alpha=0.99, N=32; items referring to the specific field of self-efficacy perception - Cronbach-alpha=0.954, N=32).

We measured students' Self-efficacy perception and SA with rubrics developed together with the students, making them able to estimate their performance completing several tasks during the school year. The rubrics were presented on assessment sheets divided into two sections: before completing the task (Self-efficacy perception), and after completing the task (Self-assessment). These sheets had two variations: one for measuring students' self-efficacy perception for writing skills and the other for measuring speaking skills development in the context of the specific task. We developed different variations of the sheets depending on the specific writing task (informal letter, story, essay, etc.). The assessment sheets included Teacher's assessment, and there was a space to express students' opinions about the whole process of assessment related to one particular task.

The rubrics referring to writing skills development contained the following criteria:

- completing the task: the students completed the task according to the instructions using an appropriate type of document following the guiding instructions (e.g. informal letter, formal letter, story, essay),
- structuring the text: the students wrote a well-structured (paragraphs) composition containing necessary elements of the type of piece of writing (informal letter: greeting, opening paragraph, etc.),
- vocabulary in use: the students used an appropriate number of words (+/-10%), and the words should be relevant to the topic discussed,
- grammar in use: the students should use grammatically correct structures, sentences and punctuation, and spelling is also included.

The rubrics referring to speaking skills development contained the criteria as follows:

- completing the speaking task,
- structuring the speaking task,
- vocabulary in use,
- grammar in use,
- intonation, pronunciation, and rhythm of speech.

The high school where we conducted the action research is located in the North of Hungary, in the center of Heves County. The number of students studying at the school is about 670-680. The sample included an experimental and a control group of students from the ninth and tenth grades (14 -15 years old). The experimental group consisted of 15 students (11 male, 5 female), while the control group included 17 students (1 male, 16 female). Both groups had five English lessons a week and were taught by the same teacher. The school allowed the teacher to conduct English lessons parallel to each other in the two groups. The method of sampling was based on this condition. The experimental group did SA on a regular basis throughout the academic year. In the control group, SA was not included on a regular basis.

The other target group of the action research was student teachers doing their long-term individual school practice at the same high school. The sample consisted of nine student teachers (5 in the experimental and 4 in the control group). The sampling depended on how many student teachers applied to the high school to do their individual long-term practice in the years of 2021/22, 2022/23 and 2023/24. The members of the experimental group carried out SA on a regular basis after their observed lessons and extra-curricular activities with an assessment sheet developed together with the mentor teachers and former student teachers at the school. The assessment sheet tested student teachers' estimates of their performance on the lessons and extra-curricular activities conducted by them. We interviewed all the nine student teachers (semi-structured interviews) at the beginning and at the end of the school practice, and the members of the experimental group after their observed lessons and extra-curricular activities. We also gathered data with the help of document analysis (student teachers' written reflections) in the experimental group. Data collection with all student teachers took two and a half years. The quality features of this part of the complex research are justified by multiple data sources, theories and methods. Intra-coding provided analytical consistency. We calculated reliability coefficients (Cohen's Kappa) ranging from 0.97 to 1.00 in the case of the pre- and post- semi-structured interviews, and those ranging from 0.88 to 1.00 in the case of the interviews conducted after the observed lessons.

4. Research Results

4.1. Students' Self-Efficacy Perception Related to Learning English as a Foreign Language

Students' Self-efficacy perception was measured with the questionnaire developed by Wang et al., [49], supplemented with 10 items measuring students' Self-efficacy perception, referring especially to their writing skills development and its self-regulation. The data gained from the measuring tool let us make comparisons between the experimental and control groups. We also measured students' Self-efficacy perception in the experimental group before performing each writing and speaking task. The Self-efficacy scales were a part of the students' SA sheet in the form of rubrics.

As we mentioned earlier, we intended to explore students' self-efficacy perception in general and especially referring to writing skills development and its self-regulation. At the end of the first academic year, in both groups, Self-efficacy perception in general was lower than at the beginning ($M_{exp.gen\_entry}=5.39$, $M_{exp.gen\_exit}=5.34$; $M_{contr.gen.entry}=6.40$, $M_{contr.gen\_exit}=5.86$). This result confirms previous research results pointing out the challenges students have to face because of the difficulties of adolescence forming their identity, coping with emotional difficulties, and the process of transition from elementary to high school with new learning environments, new classmates, and new requirements [50]. The students had to face similar difficulties at the beginning of their studies at the secondary school in our case.

Comparing the entry and the exit means, out of ten sub-categories, seven were higher at the end of the first year in the experimental group and none in the control group. The categories such as "42. I am capable of making new learning goals based on the assessment of the previously written task" ($M_{exp}=5.80$) referring to Self-regulation, and the category of "36. I am capable of planning completing the writing task" ($M_{exp}=5.73$) with the biggest differences compared to the entry results justify that students' Self- efficacy perception changed with a bigger rate in the experimental group than in the control group. The Independent T-test did not show a significant

difference in these categories; consequently our results are relevant to describe the changes only in the sample. Furthermore, the students in the experimental group reached higher means in two categories at the end of the year referring to Self-efficacy perception in general, and in four categories referring especially to Self-efficacy in writing skills development and its self-regulation, than those in the control group compared to the entry results (35. item, 38. item, 39. item and 42. item). The Independent T-test did not show any significant differences between the groups; consequently these results characterize only the sample justifying the impact of contextual factors on students' learning.

Considering Students' Self-efficacy perception referring especially to writing skills development and its self-regulation, the experimental group had higher means at the end of the school year compared to the entry results (M_exp.spec_entry=5.11, M_exp. spec_exit=5.47), whereas the control group had lower means (M_cont.spec_entry=6.11, M_cont. spec_exit=5.71) (See Table 1).

As we extended our experiment for the second year, we could compare the means of the entry and exit surveys with each other. Comparing the entry and exit results (second year), the mean differences were bigger in the experimental group than in the control group. We could find significant differences ($p<0.05$) in the experimental group in the following categories:

4. I am able to write texts in English on the internet (Facebook, blog, and messenger). $F(5,90)=7.085$, $p<0.00$; M_entry.=4.53, M _exit=6.13)

20. I am able to read short stories in English. $F(5,50)=6.765$, $p<0.05$; M_entry=4.53, M_exit= 6.13

22. I am able to answer the teacher's questions in English. $F(5,90)=6.682$, $p<0.05$; M_entry=4.60, M_exit=6.00

26. I am able to understand telephone numbers in English. $F(5,90)= 5.352$; $p<0.05$; M_entry=4.73, M_exit=6.52

31. I am able to write a short introduction in English. $F(5,90)=12.319$, $p<0.05$; M_entry=3.87, M_exit= 6.27

35. I am able to write a letter in English in an appropriate style. $F(5,90)=3.999$, $p<0.05$; M_entry=5.20, M_exit=6.47

38. I am able to write an opinion essay in English on a given topic. $F(5,90)=5.391$, $p<0.05$; M_entry=4.73, M_exit=6.40

39. I am able to write a formal letter to ask for information (application for a language course, a summer job). $F(5,90)=3.314$, $p<0.05$, M_entry=4.93, M_exit=6.27

Five out of eight categories refer to writing skills development.

Examining the control group, we could find significant differences in the following categories, both referring to writing skills development:

17. I am able to make sentences with set expressions. $F(5, 90)=4.400$, $p<0.05$; M_entry=6.59, M_exit=6.76

31. I am able to write a short introduction in English. $F(5, 90)=12.319$; M_entry=5.29, M_exit=6.88

We surveyed students' Self-efficacy perception before completing each writing in the experimental group with the help of an assessment sheet containing rubrics. This way, we had an opportunity to see the trends during the time of two years. In the field of writing skills development, students had the highest Self-efficacy perception related to structuring the task (M=92.76%), followed by completing the task (M=90.54%), vocabulary in use (M=76.15%) and grammar in use (M=63.73%). The trend lines showed a slight increase in grammar in use, stagnation in vocabulary in use and completing the task, and a slight decrease in structuring the task.

As we mentioned earlier, we extended the scope of research in time, and in the second academic year, we decided to include regular self-assessment in the field of speaking skills development. In performing speaking tasks, students reached the highest mean in completing the task (M=81.89%), followed by structuring the speaking task (M=81.80%), vocabulary in use (M=69.49%), pronunciation, intonation and the rhythm of speech (M=68.63%) and grammar in use (M=56.53%). The trend lines were increasing in all categories during the two years' time.

Table 1. Students' Self-efficacy perception referring especially to writing skills and their self-regulation at the end of the first year

Self-efficacy perception referring especially to writing skills development and its self-regulation												
		33. category	34. category	35. category	36. category	37. category	38. category	39. category	40. category	41. category	42. category	M
control group (N=17)	**entry**	6.35	6.12	6.47	6.24	6.12	6.12	5.71	5.53	6.00	6.41	6.11
	exit	5.76	5.94	6.12	6.06	5.65	5.35	5.41	5.41	5.65	5.76	5.71
experimental group (N=15)	**entry**	5.40	5.20	5.20	5.20	5.40	4.73	4.93	4.93	5.07	5.07	5.11
	exit	4.93	5.60	6.13	5.73	5.20	5.40	5.67	5.27	4.93	5.80	5.47

To summarize the results referring to students' Self-efficacy perception, we examined it in three dimensions in our research: at the beginning, at the end of the intervention in the experimental and the control groups, and before completing each task in the experimental group during the time of the intervention. At the end of the first year, the means of Self-efficacy perception in general were lower than the means of the entry test in both groups. It is probably because of special challenges of adolescence culminating at this age, and difficulties of transition between two education levels. Comparing the means of the two groups, certain categories of Self-efficacy perception referring especially to writing skills development and its self-regulation, were higher at the end of the first year in the experimental group than in the control group. Differences between means of the exit and entry tests were bigger in the experimental group than those in the control group. The experimental group had more categories with significant differences by the end of the intervention than the control group, and among them, the experimental group showed more categories referring to writing skills development than the control group. Only the means of certain categories of writing skills development showed rising trends by the end of the second year, whereas all means of speaking skills development were rising.

4.2. Students' Self-Assessment and Self-Efficacy Perception

Seeing the trends at the end of the first academic year, when students' Self-efficacy perception in general was a bit lower than at the beginning of the year, we decided to prolong our intervention for the second academic year and extend the regular use of SA in a new field, speaking skills development. We got the results depicting the interrelations among students' Self-efficacy, SA and Teacher's assessment by analyzing data gained from the assessment sheet and its variations used on a regular base.

In the length of two academic years, in the experimental group, students' SA showed varied trends viewing the categories of completing the task, structuring the text, vocabulary in use and grammar in use in writing skills development. Their SA was the strongest in the case of structuring the text. The range of means was from 72%-96.67% depending on the type of the task. The lowest means appeared in grammar in use ranging from 65.67 % to 74. 67%.

In the field of speaking skills development, SA categories showed increasing trends by the end of the second school year. The category of grammar in use was at the lowest level ranging from 57.80 % to 64.60%, and structuring the speaking task was at the highest level ranging from 64.55% to 93.33% (See Table 2).

Pearson correlation coefficients showed positive, weak but significant associations between the categories of Self-efficacy perception and SA ($p<0.000$; 0.004; 0.031; 0.014; 0.001; 0.002; 0.006) in the field of writing skills development. Consequently, higher Self-efficacy perception aligns with higher SA. The strongest association appeared between the categories of Self-efficacy perception of grammar in use and SA of grammar in use ($r=0.745$, $p<0.05$) (See Table 3).

As for speaking skills, Pearson correlation coefficients indicated positive, weak and moderate associations between the categories of Self-efficacy perception and SA, with fewer cases of significance ($p<0.005$) than in the field of writing skills. The strongest association was between the Self-efficacy perception of grammar in use and SA of grammar in use ($r=0.684$, $p<0.05$). These two strongest associations reveal that students in the experimental group perceived the highest Self-efficacy if they performed well in grammar in use in both types of tasks; consequently they perceived their Self-efficacy through the lens of grammar in use. This result directs our attention to the role of the components of Self-efficacy perception and SA in language learning.

Summarizing the results referring to SA and its relationships with Self-efficacy perception, we could see varied trends in writing skills and a slight increase in speaking skills development by the end of intervention. Pearson correlation coefficients showed stronger associations between the categories of Self-efficacy perception and SA in writing skills than in speaking skills development. In both cases, the strongest associations showed students perceived stronger Self-efficacy if they did better in grammar in use. We cannot generalize the results; they depict a certain group of students in a certain context, revealing certain factors dominating the formulation of participants' Self-efficacy perception and SA.

4.3. Interrelations among Self-Efficacy Perception, Self-Assessment and Teacher's Assessment

In order to explore the interrelations among students' Self-efficacy perception, SA and Teacher's assessment, we conducted linear regression analyses. The results show that the variables of SA and Self-efficacy perception explain each other most often and to the largest extent (See Figure 1).

The regression coefficients of Self-efficacy perception in grammar in use (ß=0.723), and that of SA in grammar in use (ß=0.723) prove their mutual interrelations. Moderate impact of Self-efficacy perception in vocabulary in use (ß=0.401) on SA in vocabulary in use, and that of Teacher' assessment in grammar in use (ß=0.242) on SA in grammar in use, was justified by our research results. It confirms the previous research results according to which Self-efficacy perception and SA have a mutual impact on each other [51, 52]. Our research results show how certain variables of Teacher's assessment influence SA; however, we could not justify the impact of any variables of Teacher's assessment on students' Self-efficacy perception in our sample.

Table 2. Associations between the categories of Self-efficacy perception and Self-Assessment - writing skills development

N=15 (p<0.05)		SA_Completing the task	SA_Structuring the text	SA_Vocabulary in use	SA_Grammar in use
SEp_Completing the task	Pearson Correlation	0.427**	0.326**	0.299**	0.337**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000
SEp_Structuring the text	Pearson Correlation	0.225**	0.578**	0.168*	0.190*
	Sig. (2-tailed)	0.004	0.000	0.031	0.014
SEp_Vocabulary in use	Pearson Correlation	0.414**	0.263**	0.597**	0.312**
	Sig. (2-tailed)	0.000	0.001	0.000	0.000
SEp_Grammar in use	Pearson Correlation	0.242**	0.213**	0.461**	0.745**
	Sig. (2-tailed)	0.002	0.006	0.000	0.000

Table 3. Associations between the categories of Self-efficacy perception and Self-Assessment – speaking skills development

N=15 (p<0.05)		SA_Completing the task	SA_Structuring the speaking task	SA_Vocabulary in use	SA_Grammar in use	SA_Int_Pron_Rhythm of speech
SEp_Completing the task	Pearson Correlation	0.515**	0.202	0.239*	0.385**	0.429**
	Sig. (2-tailed)	0.000	0.082	0.039	0.001	0.000
SEp_Structuring the speaking task	Pearson Correlation	0.346**	0.488**	0.354**	0.402**	0.342**
	Sig. (2-tailed)	0.002	0.000	0.002	0.000	0.003
SEp_Vocabulary in use	Pearson Correlation	0.255*	0.226	0.440**	0.454**	0.413**
	Sig. (2-tailed)	0.027	0.051	0.000	0.000	0.000
SEp_Grammar in use	Pearson Correlation	0.411**	0.127	0.430**	0.684**	0.489**
	Sig. (2-tailed)	0.000	00.279	0.000	0.000	0.000
SEp_Int_Pron_Rhythm of speech	Pearson Correlation	0.356**	0.162	0.573**	0.543**	0.622**
	Sig. (2-tailed)	0.002	0.166	0.000	0.000	0.000

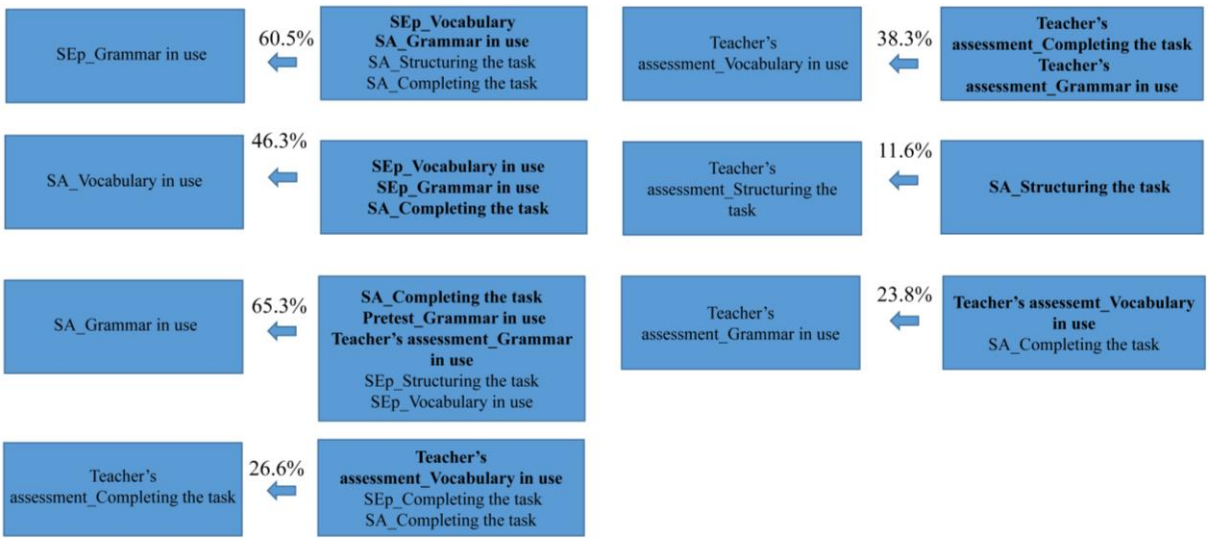

Figure 1. The interrelations of the variables – writing skills

In the case of speaking skills development, we could analyze only the interrelationships among the variables of students' Self-efficacy perception and SA because of the small sample size (See Figure 2). The linear regression analyses showed the strongest impact of Self-efficacy perception in grammar in use on SA grammar in use (β=0.527), aligning with the results of the writing skills development. We can conclude that the variables of the two constructs included in the models have a strong impact on each other, but not separately, rather as a whole as a combination effect.

1. model		
SEp_Completing the task	**46%**	SEp_Structuring the speech SEp_Vocabulary in use **SA_Completing the task (β=0.355)+** SA_Vocabulary in use SA_Int_Pron_Rythm of speech
2. model		
SEp_Completing the task	**45%**	SEp_Completing the task SEp_Grammar in use **SA_Structuring the speech (β=0.417)+** SA_Vocabulary in use SA_Completing the task
3. model		
SEp_Vocabulary in use	**37%**	SEp_Completing the task **SEp_Int_Pron_Rythm of speech (β=0.361)+** SA_Vocabulary in use SA_Grammar in use
4. model		
SEp_Grammar in use	**60%**	SEp_Completing the task SEp_Int_Pron_Rythm of the speech **SA_Grammar in use (β=0.472)+**
5. model		
SEp_Int_Pron_Rythm of the speech	**59%**	SEp_Completing the task SEp_Vocabulary in use SA_Vocabulary in use **SA_Int_Pron_Rythm of the speech (β=0.270)+**
6. model		
SA_Completing the task	**39%**	**SEp_Completing the task (β=0.423)+** SEp_Structuring the speech SEp_Grammar in use SA_Structuring the speech
7. model		
SA_Structuring the speech	**41%**	SEp_Structuring the speech **SA_Completing the task (β=0.314)+** SA_Grammar in use
8. model		
SA_Vocabulary in use	**44%**	SEp_Strukturálás SEp_Vocabulary in use SEp_Grammar in use **SEp_Int_Pron_Rythm of the speech (β=0.326)+** **SA_Completing the task** SA_Grammar in use SA_Int_Pron_Rythm of the speech
9. model		
SA_Grammar in use	**61%**	SEp_Completing the task SEp_Vocabulary in use **SEp_Grammar in use (β=0.527)+** SA_Structuring the speech SA_Vocabulary in use SA_Int_Pron_Rythm of the speech
10. model		
SA_Int_Pron_Rythm of speech	**50%**	SEp_Completing the task SEp_Structuring the speech **SEp_Int_Pron_Rythm of the speech (β=0.367)+** SA_Vocabulary in use SA_Grammar in use

Figure 2. The interrelations of the variables – speaking skills (We indicated only the significant variables in the models. The strongest explanation force is marked with +)

The cluster analysis helped us to explore naturally occurring groups within the data set in two fields of language development. With the help of Hierarchical cluster analysis with Ward's method, we could identify two clusters in writing skills development: the Realistic (nine students) and the Unrealistic (six students) groups. Students in the Realistic group (First cluster) had high levels of Self-efficacy perception and SA, and Teacher's assessment was at the same level as their SA. Students in the Unrealistic group (Second cluster) had a slightly higher level of SA compared to Teacher's assessment (See Table 4).

Regarding speaking skills, we could identify three clusters: the Realistic group 1 (First cluster), the Unrealistic group (Second cluster) and the Realistic group 2 (Third cluster) (See Table 5).

Table 4. Self-efficacy perception – SA - Teacher's assessment –patterns within the experimental group_writing skills

Report													
Ward Method		SEp_completing the task	Sep_structuring the text	Sep_vocabulary in use	Sep_grammar in use	SA_completing the task	SA_structuring the text	SA_vocabulary in use	SA_grammar in use	TA_completing the task	TA_structuring the text	TA_vocabulary in use	TA_grammar in use
1	Mean	87.22	81.44	86.89	88.11	88.33	86.33	85.78	84.22	87	85.44	84.11	86.11
	N	9	9	9	9	9	9	9	9	9	9	9	9
2	Mean	73.83	67.5	73.5	78.33	79.67	72.5	76.33	75.67	71.83	70	72.83	70.67
	N	6	6	6	6	6	6	6	6	6	6	6	6
Total	Mean	81.87	75.87	81.53	84.2	84.87	80.8	82	80.8	80.93	79.27	79.6	79.93
	N	15	15	15	15	15	15	15	15	15	15	15	15

Table 5. Self-efficacy perception – SA - Teacher's assessment–patterns within the experimental group_speaking skills

Report															
Ward Method		Sep_completing the task	Sep_structuring the speech	Sep_vocabulary in use	Sep_grammar in use	Sep_Int_Pron_Rhythm	SA_completing the task	SA_structuring the speech	SA_vocabulary in use	SA_grammar in use	SA_Int_Pron_Rhythm	TA_completing the task	TA_structuring the speech	TA_vocabulary in use	TA_grammar in use	TAK_Int_Pron_Rhythm
1	Mean	95.00	85.00	87.00	72.00	85.25	90.00	90.00	85.00	78.50	85.25	98.25	98.25	96.50	90.25	93.50
	N	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2	Mean	61.75	65	58.25	36.5	55	70.5	76.75	63.5	41.5	56.75	83.25	85	70.25	48.25	65.25
	N	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3	Mean	85.86	89.57	66	59.14	67	82.86	84.71	65	56.29	65.86	92.43	85.86	78.29	64.86	73.29
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Total	Mean	81.87	81.8	69.53	56.53	68.67	81.47	84	69.93	58.27	68.6	91.53	88.93	81	67.2	76.53
	N	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15

In the Realistic group 1, the students (N=10) had high levels of SA and Self-efficacy perception, and SA was slightly higher than Self-efficacy perception. Comparing the students' SA to the Teacher's assessment, we can see that they overlap each other. In the Realistic group 2 (N=4), SA and Self-efficacy perception were also high but a bit lower than in the Realistic group 1. In this group, the students' Self-efficacy perception was slightly higher than their SA, and the Teacher's assessment, similarly to the first group, overlapped with SA. The Unrealistic group included only one student, whose Self-efficacy perception and SA were much lower than in the case of the previous two groups, and there was a wide gap between SA and Teacher's assessment. The student assessed his achievements at a higher level than the teacher did. This result pointed out the need for assistance from the teacher in order to back the student's SA by explaining the criteria of assessment, giving examples and modelling SA.

The results of linear regression analyses showed that the categories of students' Self-efficacy perception and SA are closely interrelated, especially referring to grammar in use in writing and in speaking skills development. Based on the cluster analysis, we could identify different patterns regarding the interrelationships among Self-efficacy perception, SA and Teacher's assessment, revealing problematic cases.

4.4. Student Teachers' Conceptualization of Self-Assessment

We explored student teachers' beliefs on SA with semi-structured interviews, which we recorded and then transformed into word documents by typing and double-coding. We calculated fidelity coefficients (f) [53] based on the sets of interviews. In case of the entry and exit interviews, the intra-coder reliability resulted in the values between 0.95 and 1, and in case of the interviews following the observed lessons between 0.88 and 1. It means that the reliability of coding was acceptable. The code system of the entry and exit interviews of the nine interviewees contained the following codes:

- conception of SA: SA in everyday life, SA in learning processes, knowledge of SA methods,
- SA as a student at the university,
- SA as a beginner teacher,
- sources of SA: students, leading teachers, mentor teachers, fellow university students, university instructors including those of instructional methodology, teacher colleagues at the partner school, family members, friends,
- strengths,
- weaknesses,
- learning goals,
- connecting learning needs (weaknesses) to learning goals,
- ways of achieving learning goals,
- assistance in achieving learning goals,
- the use of SA in their own instruction.

According to the student teachers (N=9), SA is a complexity of processes which is present not only in people's lives in general but also especially in the context of their professional development. In the context of teaching, it is the engine of professional development. Learning means two things for the student teachers in the cohort. On the one hand, it refers to their learning as students at the university; on the other hand, it refers to their professional development as beginning teachers. They identified SA as a tool for improvement, making their own way in life, and being an active agent in their life. They do SA with the help of criteria defined by others or by themselves. Some student teachers conceptualized SA as an instructional method. They usually ask students to reflect on their learning processes in oral or written form during or after lessons. The student teachers in the sample articulated the need for realistic SA, and they claimed that the sources of their SA are students, mentor teachers and leading teachers.

The members of the experimental and the control groups named several strengths and weaknesses in the entry and exit interviews. In the entry interviews, these were related mainly to their student's identity (reading, writing skills, critical way of thinking, learning individually, learning in a group, self-assessment as a student etc.) but in the exit interviews, they were mostly related to their professional identity (selecting teaching material, differentiation, motivating students, supporting sense of community, planning lessons, communication skills, collaboration, adjusting to students' needs etc.). The members of the experimental group (N=5) mentioned more professional fields as their strengths than the members of the control group (N=4) in the exit interviews. Considering learning needs, in the exit interviews, the members of both groups mentioned almost the same professional fields; there was no difference between the groups in this matter, showing that their pedagogical content knowledge became deeper due to the long-term teaching practice and not regular SA.

As for the learning goals, the interviewees named 18 fields including three domains. The first group contains goals, which contribute to instruction itself: time management, flexible planning, class management, and motivating students. The second group includes goals referring to the pedagogical and pedagogical content knowledge: wider knowledge as a form teacher, pedagogical content knowledge, knowledge of the curriculum, gaining deeper practical knowledge, self-development, applying theory in practice, and knowing and applying a wide range of instructional methods. It is interesting that they hardly ever mentioned subject knowledge to be developed. The third group of goals refers to their personality traits: capability of managing unexpected situations, adjustment to students' interests, needs, and developing self-confidence.

We can see from the results that the long-term individual practice greatly contributes to the development of pedagogical content knowledge. It is justified by the results showing the transformation of the student teachers' identity.

4.5. Student Teachers' Self-Assessment Based on Two Sets of Criteria

Besides qualitative analysis, we examined student teachers' SA gained with the help of quantitative data, which we collected with the help of two scales. One of them consisted of constructs related to the components of the teaching process (planning lessons, conducting lessons, assessment and extra-curricular activities), altogether 35 items. The other set of criteria contained the learning outcomes of the particular teacher-training program conceptualized in student teachers' competences (9 items). We measured their SA with two five-level scales ranging from very bad to excellent.

As for the teaching process, the means at the beginning of the school practice ranged from 2.22 to 4.78 (M=3.85), and at the end of the practice from 2.67 to 4.56 (M=3.97). The highest mean was in the category of "communication with my mentor teacher" at the entry (M_entry=4.78) and at the exit (M_exit=4.67). The lowest mean appeared in the category of "communication with the parents" (M_entry=2.22; M_exit=2.627). Comparing the means of the experimental group to those of the control group, we can see that the experimental group had the same means at the entry (M_entry_exp=3.89) and the exit (M_exit_exp=3.89), while the control group had higher means at the exit (M_entry_cont=3.79; M_exit_cont=4.08).

The biggest differences between the means in the experimental group occurred in the category of "differentiation" (M_entry_exp=3.6, M_exit_exp=2.6) in a negative direction, and in the categories of "conducting extra-curricular activities" and "writing professional portfolio" in a positive direction (M_entry_exp=2.8; M_exit_exp=4.22

In the control group, the biggest differences between the means were in the categories of "time management in the classroom" (M_entry_cont=3.25; M_exit_cont=4.50), "managing tasks of the long term school practice", "writing my thesis", "preparing for lessons", "writing reflections on the lessons", "completing university assignments" (M_entry_cont=3.00, M_exit_cont=4.25) in a negative direction. The biggest difference in a positive direction occurred in the category of "forming goals after conducting extra-curricular activities" (M_entry_cont=4.25; M_exit_cont=3.25).

The criteria of the of the SA of the competences were as follows: "developing students' personality" (1. comp.), "supporting development of sense of community" (2. comp.), "pedagogical planning" (3. comp.), "developing students' knowledge, skills" (4. comp.), "developing students skills contributing to life-long learning" (5. comp), "organizing learning processes" (6. comp), "pedagogical assessment" (7. comp.), "professional cooperation and communication" (8. comp.), "commitment to professional development" (9. comp.). The student teachers' overall SA was higher at the exit than at the entry (M_entry=3.90; M_exit=4.26). The competences (2, 3, 4, 7, 8, 9.) had higher means at the exit than at the entry. The means in the experimental group ranged from 3.40 to 4.40 at the entry (M_entry_exp=3.98), and from 3.8 to 4.6 at the exit (M_exit_exp=4.20) (See Table 6).

The control group had means ranging from 3.25 to 4.5 at the entry (M_entry_cont=3.81) and from 4.00 to 4.75 at the exit (M_exit_cont=4.33). The experimental group had lower means in six categories (1. 2. 6. 7. 8. 9. competences) at the exit than the control group. It means that in certain fields, the members of the experimental group were much more critical of themselves than those of the control group were (See Table 7).

Table 6. Means of the competences in the experimental group (c=competence)

N=5	**1. c**	**2. c**	**3. c**	**4. c**	**5. c**	**6. c**	**7. c**	**8. c**	**9. c**	**Means/Total**
Entry	4.40	4.00	3.60	4.20	4.40	4.00	3.40	3.80	4	3.89
Exit	4.00	4.20	4.40	4.60	4.20	3.80	4.00	4.40	4.2	4.20

Table 7. Means of the competences in the control group (c=competence)

N=4	1. c	2. c	3. c	4. c	5. c	6. c	7.c	8. c	9. c	Means/Total
Entry	4.00	4.00	3.75	3.50	4.00	4.50	3.25	3.75	3.50	3.81
Exit	4.25	4.25	4.25	4.00	4.00	4.25	4.50	4.75	4.75	4.33

Summarizing the results, we can conclude that regarding the components of the teaching process, the experimental group had the same means of SA at the entry and the exit; while regarding the professional competences, their exit means of SA were a little bit higher than their entry means. In the control group, the exit means were higher than the entry means measuring the components of the teaching process. Referring to the professional competences, both groups had higher means at the exit than at the entry. If we take the absolute value of the means in both sets of criteria, we can conclude that the members of the experimental group were much more critical of themselves at the end of the long-term individual practice than those of the control group were. These results show that the regular use of SA made the student teachers in the experimental group more aware of their professional strengths and weaknesses, and furthermore more critical of themselves. The criticism is justified by the overall means of the categories of the two sets of criteria and the differences between the exit means, showing lower values in the experimental group.

4.6. Student Teachers' Self-Regulation

The code "connecting learning needs to the learning goals" needs consideration if we want to get information about student teachers' self-regulation.

We can see three groups of student teachers based on this code. The first group included those who linked their learning needs to their learning goals in the entry and exit interviews (See Table 8). They were all from the experimental group. The second group contained three student teachers, in whose case linking learning needs to their learning goals appeared only in the exit interviews. Only one of them was the member of the experimental group. In the third group, we could not detect the connection either in the entry or in the exit interviews. One of the student teachers belonged to the experimental group and the other two to the control group. Seeing these results, we can conclude that regular SA supported by an assessment sheet (rubrics) and reflective discussions may play only a partial role in connecting learning needs to learning goals, but it does not make fundamental changes in student teachers' beliefs and behavior. There were three people among the five participants of the experimental group, who we can name as strong self-regulators, and regardless of supporting their SA, they regulate their own learning processes. We could identify the supporting function of regular SA in the case of those participants who mentioned connecting their learning needs to their learning goals only in the exit interviews. There was one student teacher in the experimental group whose beliefs and behavior referring to SRL did not change at all. In the control group, only two student teachers mentioned the connection between learning needs and learning goals in the exit interviews. Two of the student teachers did not mention it at all. The results of the experimental and control groups suggest that the complex system of the long-term individual school practice assists student teachers' self-regulation, and regular SA is only one agent but not the only one, which can support it.

Table 8. The category of "Connecting learning needs to the learning goals"

N=9	Connecting learning needs to learning goals	
	Entry	Exit
ST1 (Exp. gr)	X	X
ST2 (Exp. gr)	X	X
ST3 (Exp. gr)		
ST4 (Exp. gr)		X
ST5 (Exp. gr)	X	X
ST6 (Cont. gr)		
ST7 (Cont. gr)		X
ST8 (Cont. gr)		X
ST9 (Cont. gr)		

The student teachers' SA profiles helped us to understand which factors may play an important role in their belief and behavioral change. We edited the SA profiles with the help of analyzing student teachers' interviews conducted after class observations (5), their self–assessment sheets, written reflections on their lessons, and mentor's reflections on the observed lessons. We analyzed data collected at different times, in different places, after lessons conducted in different classes with the help of quantitative and qualitative methods. The analyses led us to conclude that each student teacher has their own individual way of developing their teacher identity, claiming for the mentor's assistance tailored appropriately. Regular SA helps them to identify or confirm their professional strengths and weaknesses, but it is not enough to become a self-regulated learner. The emotions linked to their teacher's identity also need consideration. These emotions can alter the learners' attention from the phases of self-regulation. Dealing with emotions takes priority for student teachers during the practice. Identifying strengths and weaknesses is crucial but not enough to manage their own learning processes by forming adequate learning goals. Dedication to getting better and forming learning goals accordingly is the basic condition of behavioral change. The results reveal the role of emotions which can alter student teachers' attention from proceeding in the logical way of analyzing the task, planning, goal setting, planning how to reach them, executing the task, assessing the performance, making attributions about success or failure and adaptation (Zimmerman and Pintrich's model). Our results align with the former research results, which reveal the regulatory role of emotions [12-15]. The student teachers, who develop deeper emotions related to their own learning and teaching processes, need more intensive

support to learn how to deal with these emotions and how to develop their self-esteem. Teacher training programs, instructors, lead and mentor teachers should be a help in it.

4.7. Using SA in Instruction

One more category needs consideration when we conceptualize our results from the perspectives of the two target groups. It is applying SA in practice. The student teachers bring their own beliefs into teacher education gained from their former school experiences. The short school practices during their university education, as well as the long-term individual school practice at the end of their teacher-training program, are pivotal in the process of forming their beliefs, attitudes related to using SA in everyday teaching processes.

All the student teachers (N=9) mentioned the benefits of SA in their teaching practice from their students' perspective.

"SA supports students' development" (ST1_exit_123).

"I think SA is important because students can identify their weaknesses, realize the fields of knowledge they have to improve. It supports their (students') content knowledge and develops their communication skills." (ST2_exit_38).

"If students do SA, they can develop their self-knowledge; they can form and apply learning strategies. For example, I realized that 10 a.m. is an ideal time for me to get involved in learning. No, I make myself do assignments at this time because I can concentrate on my tasks much better." (ST4_Entry_33).

When we asked the interviewees if they use SA in their teaching practice, only three of them agreed. They belonged to the experimental group. They mentioned practices such as carrying out SA during microteaching at the university, or carrying out SA after students' mini lectures, and at the end of the lessons for assessing students' activity.

5. Discussion

Relatively few research results orient scholars regarding the interrelations between SA and SRL in practice [15]. The research is mainly cross-sectional studies. Longitudinal surveys that give opportunities for deep analyses and a deeper understanding of the interrelations among SA, Self-efficacy perception in the context of SRL are rare. On the other hand, these studies require a long time, very precise, instructional preparations, and measuring tools prepared carefully. The number of students bearing interventions is usually limited due to more personal involvement and interaction on behalf of the participants. In our longitudinal research, we tried to examine the role of SA in SRL from a different perspective, taking into account the challenges of the previously mentioned aspects. By providing rich and deep methodological approaches to the research problem, we wanted to compensate for the limitations of our survey with such a profile.

Our results conducted in the frame of longitudinal action research confirmed the supporting role of SA in SRL stated by previous cross-sectional research [51, 52, 54]. It became obvious that SA during the process of learning is not the only agent that assists SRL. It helps students (we mean high-school students and student teachers) identify their strengths and weaknesses related to special contexts of learning, and in certain cases, connect learners' learning needs to their learning goals. Feedback (self-reflection), judgements on the learning achievements and forming new learning goals in an ideal case generate more effective self-regulation, but in real-life situations, emotional processes can have a great impact on cognitive and metacognitive processes [12, 13]. It is possible that students monitor their learning processes and compare original learning aims to their achievements, identifying their strengths and weaknesses, but sometimes it can happen that they do not form relevant learning goals. These problematic cases occurring in the teaching practicum need further research. Models of SRL describe ideal cases but to understand how SRL really works, we need to explore problematic cases, situations [55]. Our study contributed to this aspect of SRL research; furthermore, it gave a new perspective to the existing cross-sectional ones.

Another research result is that we could justify that effective SRL is not influenced by age [54, 55]. There are high-school students and student teachers who can regulate their own learning processes at a very high level but there are others, who need support in it. The students whose SA is too high or too low compared to the external assessments need more attention. Presenting and conceptualizing the criteria of SA, modelling SA in the context of the learning task, discussing possible difficulties, errors and redoing the task can provide effective support.

Our research results revealing the challenges of transition for high-school students from a lower to a higher level of education, align with former research results [50, 56]. It broadens the dimensions of transition studies (e.g. from kindergarten to elementary school), pointing out that transition can cause a lower level of Self-efficacy perception, and teachers should pay attention to this problem. Although we cannot eliminate the difficulties, we can decrease their impact by using best practices bridging elementary and high school as different learning environments by applying best practices on an institutional level [36]. In the classroom, communicating, discussing and forming requirements, giving constant feedback to students' achievements in a transparent way, modelling task performance, exploring the roots of errors, and supporting students in being acquainted with and applying effective learning strategies can be effective solutions.

All the previously mentioned implications deserve consideration from a didactic point of view. Assessment for learning is a very important component of teaching-learning processes [44, 45]. Using SA supported by rubrics, SA sheets, as well as taking advantage of discussions,

reflections, and self-reflections, can add to assessment for learning in a methodological aspect. In the context of long-term individual practice, mentor teachers can make student teachers aware of the challenges and opportunities of SA to support their students' more effective learning, and furthermore to become better teachers. The measuring tools developed during our action research may also support teachers and mentors in developing their students' and student teachers' SA.

6. Conclusions

The findings of the present study confirmed that students' SA plays an important role in their SRL with supporting their self-knowledge, meaning being more aware of their strengths, weaknesses and learning goals. We examined this role from a new aspect. The longitudinal perspective helped us to examine the deeper context of SRL; furthermore, we had an opportunity to develop context-based SA tools and apply methodological procedures fitted to the special contexts. The research results revealed some strategic points in the learning-teaching process as far as the interrelations between SA and SRL are concerned. The teacher's role is to support students in identifying their learning needs and linking their learning goals to their learning needs. We hope that our research results make beginner and even more experienced teachers recognize the role of SA in their pedagogical assessment practice.

7. Limitations and Future Research

We explored the role of SA in SRL in the context of high-school students' English language learning and student teachers' long-term individual practice in our longitudinal-action research. The research has limitations regarding the sample size of the cohorts of students. We can explain it with the type of intervention, which required intensive involvement of the researcher, being the teacher of high-school students and the mentor teacher of student teachers.

Regarding high-school students, we surveyed their SA and Self-efficacy perception only on the domains of writing and speaking skills development in English as a foreign language. In the future, developing and examining their reading and listening skills with the help of regular SA would add to a deeper understanding of the role of SA in complex language skills development. Pedagogical implications would point out the differences between productive skills and receptive skills development, and these results would contribute to language pedagogy.

Regarding both cohorts of students, increasing the sample size would give a wider perspective to examine the role of emotional processes in self-regulation and their intervention in cognitive processes, foreshadowing further methodological implications in teaching and mentoring practice.

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