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Changes in Students' Perceptions of Self-Assessment in Courses with Different Approaches to Assessment

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Abstract: The importance of student self-assessment and its contribution to learning in teacher education is well documented in the research literature. However, we still need to better understand when and why self-assessment actually works. This study examines preservice teachers' perception of self-assessment prior to and following experiencing self-assessment. The study included 135 students studying at two education colleges in Israel. The students attended courses with differing evaluation approaches. The findings show that the experience with self-assessment in the courses with formative evaluation or integrative evaluation encourages the students' positive perception of self-assessment, in contrast to summative evaluation courses. The study expands our understanding of the importance of student involvement in the evaluation processes, as well as the role of the feedback in the process. These two factors had the greatest impact on the students' perceptions, as well as on the accuracy of their self-grading.

Keywords: Self-assessment; formative evaluation; summative evaluation; student perceptions; higher education

Self-assessment

There appears to be no consensus in the literature as to what self-assessment actually is. The use of this term describes a broad variety of activities and mechanisms, and reviews of self-assessment call for a much clearer definition of the term (Brown and Harris, 2014; Panadero, Brown and Strijbos, 2016). From a pedagogical perspective, self-assessment requires the personal capacity to identify the components and characteristics of work, self-skills or performance, and to judge their value (Tai et al., 2018).

According to Bourke (2014), self-assessment is accompanied by the students' critical reflection on their knowledge. The understanding and application of skills that take place during this process encourage a deeper approach to learning. It is through this process that the students become active and responsible for their learning (Harris and Brown, 2018), and the self-assessment helps them to discover their strengths and weaknesses, thus improving their future performance. Therefore, students need to acquire these skills of evaluating knowledge and judging their performance if they are to succeed in higher education (Guillory and Blankson, 2017). Kurejsepi (2013) argues that self-evaluation is an unavoidable factor in teachers' professional development and that teachers must take responsibility for designing appropriate learning environments. Future teachers who acquire self-assessment skills should be able to evaluate and improve their teaching techniques and thereby advance their professional development.

Self-assessment and self-regulated learning (SRL) are closely related concepts, relevant mainly in the context of setting goals, monitoring learning, and metacognition. The implication of this is that self-assessment should be able to contribute to learning itself, for example, by clarifying the study goals and involving the students in monitoring their own study process (Panadero, Jonsson, and Botella, 2017).

Various studies, including two meta-analyses show a positive link between self-assessment and cognitive capabilities and academic achievements (Graham, Herbert, and Harris, 2015; Sanchez et al., 2017). From these reviews and additional studies, it is possible to conclude that students involved in self-assessment tend to improve their cognitive capability and their exam grades in comparison with students who have not conducted self-assessment. Consequently, self-assessment should improve learning and performance, and researchers view self-assessment not only as an alternative method of evaluation in teaching, but also as a strategy for promoting productive learning (Yan et al., 2020).

Student self-assessment can be conducted quantitatively, qualitatively, or descriptively, and it comprises different techniques and various tools, through which the students describe and evaluate the quality of their study products (Panadero, Brown and Strijbos, 2016). The selected tool will be determined according to, *inter alia*, the purpose for the self-assessment and the decision of whether or not to pre-determine self-assessment criteria and standards. These tools include self-assessment templates, self-assessment checklists, scripts, and structured qualitative rubrics (Harris and Brown, 2018). Panadero et al. (2013) examined standards relating to self-assessment using rubrics or lists of assessment criteria presented as questions (e.g., “Did I clearly word the main goal in my work?”). They found that those students who used the list of questions had higher levels of self-regulation learning compared with the rubrics group.

Much discussion has centered around the question of whether self-assessment should be formative or summative. This then raises the question of whether or not to include self-assessment in courses involving summative or formative evaluation. Formative evaluation enables both the student and the teacher to monitor the learning process using feedback, with the goal of effecting changes to improve both learning and pedagogical performance. In summative evaluation, upon completion of the course or the study unit, the teacher examines whether the student has attained the study goals and reflects the student’s performance by means of a grade (Ferrell, 2012). The score clearly reflects evaluation based on systematic criteria, but in general, summative evaluations provide quantitative data and are focused on outcomes. Addressing the questions of the purpose of self-assessment and why students are asked to evaluate themselves, Andrade (2019) responded that the inherent value in self-assessment is in the existence of feedback. Thus, if the student has no opportunity to make corrections and changes, then the self-assessment has no real value.

The feedback indicates what elements must be corrected or expanded, and should thereby promote further study as well as the student’s ability and motivation for self-assessment. Summative evaluation also often involves providing feedback to the student, but the timing of the feedback here has a critical impact – the summative evaluation is given at the end of a specific study stage; thus, the feedback is less important to the student than his or her score (Winstone, Nash, Rowntree and Menezes, 2016).

As the feedback is an integral part of the formative evaluation, it appears that self-assessment has a much greater advantage in formative evaluation, as it focuses on the learning process rather than the grade (Brown, Andrade and Chen, 2015). Moreover, the problematic nature of the accuracy and validity of self-assessment is much more prominent in summative evaluations (Yan and Brown, 2017), and this factor too helps explain its advantage when combined with formative evaluation.

Student Perceptions of Self-Assessment

Studies of the perceptions of elementary school students indicated a superficial understanding of self-assessment goals (Bourke, 2016). In contrast, studies conducted among higher education students have shown that most of them did understand the need for self-assessment (Ratminingsih, Marhaeni and Vigayanti, 2018) and thought it was beneficial mainly for the purposes of improvement and correction (Micán and Medina, 2017). Moreover, college and university students believed that self-assessment increases responsibility for learning (Bourke, 2014; Ndoye, 2017) and that it nurtures self-regulated learning, which refers to a student's ability to regulate his or her thoughts and behavior during study in order to attain the desired study goal. It is achieved through goal setting, planning, monitoring, and feedback (Bozkurt, 2020; Wang, 2017).

These positive perceptions regarding self-assessment tended to be expressed by students becoming involved in formative evaluation, in defining the criteria of their evaluation (Bourke, 2014), or using various tools, such as checklists, that enabled them to revise their work (Wang, 2017). Although there is not extensive evidence about summative evaluation, it has been found that adult students attending courses incorporating it have also reported that the self-assessment helped to foster critical thinking (Van Helvoort, 2012).

Although students' perception of self-assessment tends to be positive, some students may think that the process of evaluation is the teacher's responsibility or that self-assessment is not reliable (Thawabieh, 2017). Therefore, the students' understanding of their role in self-assessment and the clear definition of the role of the teacher and the student from the inception of the process have an impact on the evaluation perceptions (Mannion, 2021).

The Importance of the Study and its Objectives

Despite the existing knowledge regarding the importance of self-assessment and its contribution to learning, a considerable portion of the evaluation processes in academic institutions involves summative evaluations by the teacher only. In order to encourage teachers to incorporate student self-assessment into their teaching, it is important to understand the pedagogical knowledge base on self-assessment and to examine how and in what type of courses evaluation self-assessment should be implemented.

Finding practical tools for addressing evaluation issues is a key challenge in education (Taras and Davies, 2012), and understanding the students' perceptions is an important component in building these tools. Promoting positive and productive perceptions of self-assessment may serve as a platform for more productive use of pedagogical assessment (Dayal, 2021). There are only about 15 studies that have examined students' perceptions of self-assessment (Andrade, 2019) and only some of these relate to adult students in higher education. It is not entirely clear why self-assessment is effective, and the limited number of studies focusing on students' motives for conducting self-assessment (Yan et al., 2020) was one of the driving factors for conducting the current study that seeks to better understand the learners' perceptions.

The main goal of this study was to examine the contribution of self-assessment in courses with different approaches to evaluation from the students' point of view. The direct goal was to examine the perceptions of the students prior to and following self-assessment in the following types of courses: courses with summative evaluation, where the students were not involved in determining the evaluation criteria; courses with formative evaluation, where the students were involved in determining the evaluation criteria; and courses with integrative evaluation (combining both summative and formative evaluation), where the

students were partly involved in determining the evaluation. The study questions derived from these objectives were:

- a. What are the students' perceptions of self-assessment both before and after their self-assessment experience in the various courses?
- b. How does the involvement of the students in determining the evaluation criteria in the course and their prior experience with self-assessment affect their perceptions and the accuracy of their self-grading?

Methodology

A qualitative study approach was selected for this study, as the general objective was to describe a phenomenon on which we have only limited information (Merriam and Tisdell, 2015).

The Study Population and the Course Characteristics

The study population included 135 science teaching students who studied in seven courses at two colleges in Israel, one a Jewish religious college and the other a secular college where Jews and Arabs study together. Table 1 presents the number of students attending each course, their gender, and their age range. There were 66 students studying for a bachelor's degree in science education (B.Ed.) and 69 students were already teachers who were studying for a master of education degree (M.Ed.). All the courses were taught by the author of this article between 2012 and 2018. Table 2 lists the names of the courses, for which academic degree it was being studied (B.Ed. or M.Ed.), the course duration, the type of evaluation, the components of the evaluation and the students' involvement in the evaluation process in each course. Two courses were studied for two hours once a week during one term (a total of 28 hours) and five courses for two terms (a total of 56 hours). Four of the courses belong to B.Ed. and three to M.Ed. studies. In two of the courses, summative evaluation was provided using an examination, in three courses formative evaluation was given based on an academic work and a presentation, and in the other two courses, an integrative evaluation (combining both summative and formative evaluation) was made based on class exercises and work. Student self-assessment was integrated into all the courses and was either formative or summative according to the type of evaluation in the course, namely, in the summative evaluation courses, the students' self-assessment was also summative – the students simply graded themselves, and in the formative evaluation courses, the self-assessment was formative.

The Study Process and Data Collection

Evaluation Methods in the Courses

In the two cell biology courses, summative evaluations were given based on an exam at the end of each semester. The students were not involved in determining the type of evaluation or the sub-topics of the exam and their value. The topics, with example questions, were presented to the students prior to the exams and the students' self-assessment amounted simply to their evaluation of their test grade.

In the three seminar courses in which the students were required to write a research work (either theoretical or empirical), the evaluation was formative, with a numerical grade. The students were involved in determining the criteria for checking the work and their

relative value. On completion of the study of the structure and role of each of the sections of the research work, a class discussion was held on the components to be included in that particular section. The discussion led to the joint creation of personal checklists of the sub-components deemed important to appear in each section of the work. An example of such a list (for the Discussion section) that was worded as questions can be found in the Appendix. The self-assessment was the students' responses to the list of questions for each chapter of the work. Students were given the option of sending each section or parts of the sections separately for checking, together with the personal lists of the chapters. When submitting the complete research work, the students were asked to attach the personal lists for each section, in which they marked what item from each list was contained in each section of their work, and explained why certain components were missing or incomplete. The reviewed works included detailed feedback on the substantive subject-related content of their initial submissions and personal lists. They were then returned to the students for revision and resubmittal.

The two research writing workshops incorporated both evaluation approaches: summative and formative. The summative evaluation did not involve student participation and related to the four exercises they had to submit as part of their coursework obligations. In each exercise, the students also attached the grade they felt they deserved for the exercise and were asked to briefly explain why they evaluated their work the way they did. Each of the exercises exposed the students to a different section in the research work (literature review, methodology, findings, and discussion), and the students received feedback for each exercise, but no opportunity was afforded for revision and resubmittal. The formative evaluation was given for the concluding research work of the course and the students were involved in the process of determining the criteria, as described earlier in relation to the seminar papers, and they were asked to attach their personal lists for each section of the work.

The Questionnaires

The students in all the courses replied to two questionnaires: one at the beginning of the course and the second one at its end, after sitting for the exam or after the final submission of their research work. The first questionnaire was mainly intended to learn about the students' perceptions with respect to self-assessment, while the second questionnaire was designed chiefly to address the changes in their perceptions after their self-assessment trial during the course. In addition to general background questions (gender, age, course name, and years of teaching experience) each questionnaire contained two open-ended questions. The questions at the beginning of the course were: a. In your opinion, should self-assessment be integrated as part of the course evaluation process? Please explain why and provide as much detail as possible; b. Have you had experience with self-assessment in the past during your higher education studies? If so, please describe this experience. The questions from the second questionnaire, after the course were: a. Did the experience with self-assessment during the course contribute to you, and if so, in what way and if not, why? Please provide details and give an example if possible; b. What grade would you award yourself for the work or the exam?

Filling out the questionnaires was a voluntary process, with careful adherence to ethical rules, and it lasted about 15 minutes per questionnaire. The questionnaires were distributed to all the 135 students in the various courses, 122 students answered the first questionnaire and 104 answered the second questionnaire (see Table 2). In all the courses, the student's self-grading was not weighted in the final grade given by the teacher.

Class no.	The course name/ Degree/College	No. of students and gender	Age range	No. of students who answered Questionnaire I	No. of students who answered Questionnaire II
1	Cell biology/B.Ed./ Religious college	19 women	20–28	18	14
2	Cell biology/ B.Ed./ Secular college	29: 9 men and 20 women	19–26	25	18
3	Seminar on science curriculum development/ M.Ed./ Religious college	20 women	28–39	18	17
4	Seminar on sciences teaching methods/ B.Ed./ Religious college	10 women	23–31	10	10
5	Seminar on sciences teaching methods/ B.Ed./ Religious college	8 women	23–36	8	8
6	Research study writing workshop/ M.Ed./ Religious college	20 women	28–45	17	16
7	Research study writing workshop/ M.Ed./ Religious college	29 women	26–46	26	21
Total		135: 9 men, 126 women		122	104

Table 1. The Study Population

Analysis of the Data

The students’ answers to the first question in both questionnaires underwent content analysis (Rossman and Rallis, 2011) and were divided into categories by the author, and separately by an expert in content analysis. The analysis was conducted in two stages. First, all the answers were read in full to identify key ideas and consider the various options for organizing the data. In the second stage, the categories derived from the students’ statements were defined. All the students wrote more than one statement, some of which were assigned to more than one category. As a result, the sum of the numbers according to categories is higher than the total number of the students who answered the questionnaires. It is important to note that many students referred to both the positive and negative aspects of self-assessment in their answers.

A few differences were found between the two analyses, and after a joint discussion between the author and the content area expert, it was agreed to divide the data into nine categories. Five of the categories relate to the contribution of self-assessment, such as strengthening the skills of reflection, motivation and responsibility for learning. Four categories express opposition to self-assessment, such as a lack of objectivity in evaluation

or the view that this should be the teacher's role. Table 3 shows the distribution of the students in each of the categories.

Class no.	Course type and name	Course duration	Degree & study year	The type of evaluation	Evaluation component	The students' involvement in the evaluation process
1	Disciplinary course: Cell biology	56 hours	First year of B.Ed.	Summative evaluation	Test	No involvement
2	Disciplinary course: Cell biology	56 hours	Second year of B.Ed.	Summative evaluation	Test	As above
3	Theoretical seminar: Seminar on science curriculum development	56 hours	Second year of M.Ed.	Formative evaluation	Theoretical seminar work and presentation	Joint determination of the components of assessment of the work and of the presentation, and their weight
4	Empirical seminar: sciences teaching methods	56 hours	Third year of B.Ed.	Formative evaluation	Research seminar work and presentation	As above
5	Empirical seminar: sciences teaching methods	56 hours	Third year of B.Ed.	Formative evaluation	Research seminar work and presentation	As above
6	Workshop: Research study writing	28 hours	First year of M.Ed.	Summative and formative evaluation (integrative)	Exercises and concluding work	Exercises without involvement Work - joint determination of the components of assessment of the work and their weight.
7	Workshop: Research study writing	28 hours	First year of M.Ed.	Summative and formative evaluation	Exercises and concluding work	As above

Table 2. Course Characteristics

The answers to the second question in the first questionnaire were summarized and the number of students with prior experience in self-assessment was calculated. In each course, the distribution of students whose self-grade was equal or similar to the teacher's grade was calculated, with a deviation of up to 5 points.

Findings

The findings for the first question in the two questionnaires present the students' perceptions prior to and after their experience with self-assessment. Table 3 summarizes the number of students who mentioned each of the categories representing their perceptions in their answers. As some students made statements attributable to more than one category, the sum of the numbers according to categories is higher than the total number of the students who answered the questionnaires. The percentages shown in Table 3 are therefore calculated according to the number of statements in each category in relation to the total number of statements that the students mentioned in each course.

Perceptions Prior to the Self-Assessment

One of the salient components in the students' perceptions at the start of the course, prior to their experience with self-assessment, was that self-assessment fosters personal commitment to studying. This component was mentioned by 35% of the students (Table 3). Student H, a first-year B.Ed. student, wrote: *It is worthwhile to integrate self-assessment in teaching if the student knows exactly what is expected of him and then this can increase the degree of responsibility that he takes for his own study.*

Mention was also made of the contribution of self-assessment to the skills of reflection and motivation for learning. Some 16% of the students related to the skills of reflection, such as Student S, a third-year student studying for her B.Ed., who observed: *"...if you need to evaluate yourself then you really need to think carefully about what you write and how you write it..."* Some 9% of the students were of the opinion that self-assessment can also promote achievements, mainly if the student's self-grade is included in the final grade.

In contrast, many students also believed that it was not advisable to include self-assessment in the course evaluation process for two main reasons; one, that such evaluation is not objective (21% of the students), and second, that the students either cannot or do not wish to evaluate themselves (19%, see Table 3). For example, Student S, a first-year student studying for her B.Ed., wrote: *I think that there is a problem with the objectivity of self-assessment. Even if I sincerely evaluate myself, I am not sure that other students will do the same and then it won't be fair.*

Another example is Student L, a first-year student studying for her bachelor's degree, who wrote: *"I think that self-assessment does contribute to learning, but I don't feel comfortable evaluating myself. I don't want the teacher thinking that I am arrogant."* Eleven students thought that the evaluation is the job of the teacher. For example, M, a second year B.Ed. student, noted: *"...I would rather the teacher evaluate, it is his job rather than mine."*

Generally, the students attending the courses with the summative evaluation expressed more negative than positive attitudes to self-assessment. All the students in these courses were either in the first or second year of their B.Ed. studies. In contrast, the students attending the courses with integrative evaluation (combining both summative and formative evaluation), all of whom were teachers studying for an M.Ed., expressed the highest number of positive perceptions and the lowest number of negative perceptions.

Perceptions Following the Self-Assessment Experience

After their self-assessment experience, the students’ perceptions in the summative assessment courses did not become more positive (Table 3). These students were not involved in determining the evaluation criteria and most of them believed that self-assessment did not contribute anything to them. Some 6% even thought that it was a waste of time. For example, second year Student A wrote: “...it didn’t help at all. There is no need for me to evaluate myself, it is simply a waste of time...”

Categories	Before (*N=122)			After (N=104)		
	Summative evaluation *n=43	Formative evaluation n=36	Integrative evaluation n=43	Summative evaluation n=32	Formative evaluation n=35	Integrative evaluation n=37
1. Achievements	-	-	11 (26%)	-	16 (46%)	13 (35%)
2. Responsibility for study	3 (7%)	12 (33%)	20 (46%)	5 (16%)	18 (51%)	22 (59%)
3. Reflection skills	7 (16%)	5 (14%)	8 (19%)	5 (16%)	12(34%)	17(46%)
4. Motivation for studying	11 (26%)	5 (14%)	9 (21%)	7 (22%)	17(48%)	16 (43%)
5. Conducive learning environment	-	-	-	-	19 (54%)	11(30%)
6. Assessment is not objective	9 (21%)	6 (17%)	11 (26%)	9 (28%)	5(14%)	7(19%)
7. This is the teacher’s job	8 (19%)	3 (8%)	-	7 (22%)	-	-
8. I cannot or do not wish to assess myself	13 (30%)	6 (17%)	4 (9%)	12 (37%)	2 (6%)	4 (11%)
9. It is a waste of time	-	-	-	6 (19%)	-	-

* N expresses the number of students who answered the questionnaire and “n” is the number of the students' statements in each course.

Table 3. Students’ Perceptions before and after their Experience with Self-Assessment

In contrast to this, the perceptions of students who were studying in the formative courses, and who were very involved in determining the evaluation criteria, displayed a more positive attitude after their experience with self-assessment. The perceptions of the students in the integrative evaluation courses changed in a similar manner. Many more students in these two course groups believed that their experience with self-assessment did contribute to the skills of reflection and motivation for learning. Furthermore, in these courses, there was a significant increase in the number of students who wrote about the

contribution of the self-assessment to their achievements (from 9% before to 28% after the trial). Thus, for example, Student R, a third year B.Ed. student, wrote:

...as I had to check and see if and how I had done each section and sub-section in the work and to mark it on the list, I was able to submit a much more complete work and gain a better grade.

Following this experience with self-assessment, a new factor appeared, related to the impact of the self-assessment on the conducive learning environment. This factor was raised only among the students who studied in formative or integrative courses. Some 30% of the students wrote about aspects relating to an atmosphere conducive to learning that was for the most part combined with motivation for study. For example, Student A, a first year M.Ed. student, wrote:

The personal checklists and the specially tailored and encouraging feedback I received from the teacher, and which all my friends also received, did not just encourage me to revise and improve, but also it gave us a good feeling and the study atmosphere in the course was excellent, even though I found the course to be very difficult.

Student Y, a third year B.Ed. student, also wrote:

...this was the hardest course I took this year, writing a seminar paper demands so much time, it really isn't simple and although I almost stopped on a number of occasions, the study atmosphere encouraged me to carry on. I also knew that even if the work would not be good, I would receive comments and could then revise it.

The self-checklists and the ability to revise the work were mentioned almost universally in the answers of the students attending the courses with formative or integrative evaluation.

Prior Experience with Self-Assessment

Prior to the course, in the first questionnaire, the students were asked to mention if they had any past experience with self-assessment and if so, to describe that experience. It was surprising to find out that only 23 students, 19%, reported having had such an experience. Only two students out of those who had prior experience were first-year B.Ed. students, eight were third-year B.Ed. students and seven were studying for an M.Ed. Most of the descriptions of this experience (18 students) pointed out the contribution of the self-assessment to learning, but some of them also described difficulties along with the advantages, thus emphasizing the complexity involved in self-assessment. Fourteen students wrote that the self-assessment was combined with peer assessment and that the self-grade and the peer grade were weighted (with varying percentages) with the grade given by the teacher. This fact made it difficult for some of them, and they claimed that it prevented objectivity. As Student N, a first year M.Ed. student, wrote: *...it was fairly clear to us that we would not undermine each other's grades and that we would award a high score for the presentations, even if this was not genuinely what they deserved. I did not feel comfortable with this and sometimes I was unable to justify the grade I had given...*

The Self-Assessment Grades

The self-grade of some 65% of all the students in all the courses was similar to the grade given by the teacher: 22% of the students awarded themselves a lower grade, while 13% rated themselves by awarding a higher grade. Analysis of the distribution of the self-grades according to courses shows quite clearly that the deviations between the self-grade and the teacher's grade were highest in the summative courses. Some 28% (nine students out of 32 who answered the questionnaire at the end of the course) evaluated themselves with a grade that was higher than the actual grade they received and 16% awarded themselves a lower grade. In contrast, in the formative and integrative evaluation courses, the self-grades on the final work were mainly similar to the teacher's grade, and only 6% awarded themselves a higher grade, while 10% gave themselves a lower grade.

Discussion

The main objective of the current study was to examine what students in higher education think about self-assessment in courses with different types of assessment. The findings indicate that the perceptions among most of the students were generally more positive than negative at the start of the course, prior to experiencing self-assessment. Many students pointed out the contribution of the self-assessment to their responsibility to learning, fostering critical and reflecting thinking, as well as motivation. At the end of the course, after gaining experience in self-assessment, many more students felt that the self-assessment had made a significant positive contribution. However, this change appeared only among the students who studied in courses with either formative or integrative (formative and summative) evaluation. The students who studied in the courses with summative evaluation also expressed the most statements relating to the problem of objectivity in self-assessment or about their lack of desire or ability to evaluate themselves at the end of the course.

It is important to consider the different types and content of the courses. Integrative self-assessment seems to be especially appropriate for the theoretical and empirical seminar (research study writing) courses. This fit of form and content could further enhance positive perception. In addition, approximately 25% of the students in the summative assessment courses did not answer the second questionnaire after performing the self-assessment. This dropout from the research study does not seem to be random, as Rubin (1976) shows in his study. It is possible that these students did not answer the second questionnaire due to dissatisfaction with the course assessment.

In her comprehensive survey, Andrade (2019) emphasizes the importance of formative self-assessment for learning based on feedback and providing an opportunity to revise work. Her claim is that self-assessment without feedback fails to achieve the objective and raises a fundamental question of what is the point of asking the students to evaluate themselves if there is no feedback. The students' perceptions that emerged from the current study tend to support this view. Almost all the students in the formative or integrative evaluation courses mentioned the important contribution of the self-checklists and the opportunity to revise their work. Students' work assignments were often better when they were given the opportunity to improve and make corrections following feedback. It is difficult to determine from

this study whether cognitive abilities improved, but it appears that learning abilities did improve.

The students' awareness in this study that they would be able to gain feedback and revise their work led to a high cooperation in relation to their self-assessment. The students' responses in the summative evaluation courses not only expressed more negative views of the self-assessment, but were also much more superficial and less complex. It is notable from what was said by the students attending the formative and integrative evaluation courses, that the focused feedback, at the appropriate timing, led them to monitor and reflect on their learning and to share the difficulties they encountered. Many of them reported that they knew precisely which components in their work needed to be improved and this contributed to their progress and to the learning environment.

Moreover, the students' involvement in determining the evaluation criteria is a critical point (Mannion, 2021; Wang, 2017), as this study also indicates. Exactly to what extent it is necessary or advisable to involve the students in the evaluation processes is still one of the key questions that remains unanswered in relation to student assessment (Taras and Davies, 2013). The attempts to answer this question explicitly or implicitly relate to the debate over the desired approach – using either summative or formative evaluation – and the self-assessment. The results of the current study reinforce the premise that student involvement and transparency during the assessment process contributed to encouraging their cooperation and to cultivating positive perceptions regarding self-assessment. Even when the students were only partially involved in the integrative evaluation courses, it was possible to see a greater improvement in the positive attitude towards self-assessment in comparison to the students who attended the summative evaluation courses and were not involved. It is important to stress that students, mainly those studying in the first or second year of their B.Ed. degree, might tend to feel that they lack sufficient knowledge or tools to propose criteria for evaluation or to discuss them sensibly at this stage of their studies. Therefore, it is important to tailor the degree of the students' involvement in the process to match their individual background. It needs to be remembered that in some cases it is not possible to include the students at all in determining the assessment criteria, as the standards may be pre-set by external authorities.

The main argument regarding teacher assessment and self-assessment focuses mainly on the degree of reliability among the graded students (Brown, Andrade and Chen, 2015). Andrade's survey (2019) presents contradicting reports about this issue, also attributable to the difference in the evaluation approaches. In the current study, the differences between the students' self-grades and the teachers' grades in the formative and integrative evaluation courses were smaller than the differences in the summative evaluation courses.

Much like the students in the study of Tejeiro et al. (2012), whose self-grades tended to be higher than the teachers' grades, many students in the summative evaluation courses awarded themselves grades higher than those of the teacher. In contrast, most of the students' self-grades in the formative and integrative evaluation courses were similar to those of the teacher. These findings contradict those of De Grez et al. (2012), for example, who showed that self-assessment scores also in formative evaluation courses were higher than the teacher's grades. It appears that the students' involvement in the assessment process in the current study, the joint definition of the evaluation criteria, transparency, and feedback all influenced the assessment accuracy. This important finding reduces the concern regarding the reliability and validity of self-assessment and stresses the need for the active involvement of the students in the assessment process.

The present study also points to a possible intriguing link between student perceptions and self-grade accuracy. Students who presented fewer positive perceptions about self-assessment were less accurate in their self-grades. It is worth exploring this

connection, as it may shed a different light on the phenomenon of accuracy in self-assessment. In any event, the degree of accuracy is a relatively minor point, as the important advantage of self-assessment is the student's ability to focus on the task's objective and to understand the criteria according to which this is measured.

Another important issue is the socioemotional aspects underlying self-assessment that emerge from this study – the reluctance of the students to engage in self-assessment due to the concern that the teacher might think that they are arrogant if they award themselves a high assessment. In order to try to overcome this reluctance or embarrassment, it is recommended to speak about this issue with the students prior to commencing the evaluation process. In the current study, at the beginning of each course, the topic of self-assessment was presented. The presentation included a dialogue that also addressed these student concerns. The study results show that there were still students who expressed reservations and concerns about the self-assessment process. Therefore, the conclusion is that there is a need to afford more opportunities for bolstering the students' trust in the self-assessment process and not just make do with one discussion. For example, it is possible to discuss questions such as: How do I evaluate myself? Which components should be taken into account during the self-assessment process? To what extent does the test or work score express the students' independent capabilities? Should the teacher take into account self-assessment that is considerably higher than the teacher's assessment or the test score? In the dialogue with the students, it is advisable to hear from them how they believe the self-assessment be carried out and then to discuss the proposed methods of accomplishing this with them.

Similar to the findings of Thawabieh (2017), the current study also shows that practice helps with the degree of accuracy of the self-grade, as most of the students who accurately graded themselves were those who had past experience with self-assessment. Furthermore, Rust et al. (2003) and Langan et al. (2008), claimed that women better understand and evaluate their performance than do men, who tend to over-evaluate the quality of their work. It could be that the fact that in the current study all the students in the formative and integrative evaluation courses were women also contributed to the relatively small disparity between their assessment and the teacher's evaluation.

One of the most challenging tasks for teachers is to make the evaluation part of the students' learning process, and despite the accumulated knowledge, self-assessment is an important challenge that needs to be addressed by the higher education institutions (Berry and Adamson, 2011). The current study shows that only a small portion of the students reported prior experience with self-assessment, and most of those who had prior experience tended to express more positive views towards it. It can be concluded that the students should gain some experience with self-assessment, and that the more the students enhance their self-assessment skills, the greater their cooperation will be in the process, together with its inherent advantages.

Limitations and Further Research

Along with the insights arising from this study, a number of limitations should be noted that point to the need for further research. First, the students who took part in the study were students who studied under the author; therefore, it was a convenience sample, which might lead to some degree of bias in the findings and thus limit their inclusion in additional populations.

Moreover, even though the students did not belong to the same cultural group, they were all from Israel, and all studied at teacher training colleges specializing in science

education. Therefore, it is important to expand the study to include additional geographic and cultural groups, and to include students from other areas of study.

In addition, all the students in this research were enrolled in face-to-face classes. Consequently, further research of self-assessment in the online environment is needed. It would also be interesting to expand the research design and examine summative self-assessment with criteria defined by the student and formative self-assessment with criteria defined only by the teacher. Such research could deepen our understanding of the impact of student involvement in determining the criteria of their perceptions. Further research combining personal interviews and even observations of the students' involvement in the assessment process, together with the written self-reports, might deepen our understanding on students' perceptions regarding self-assessment. This understanding may strengthen pedagogical and practical recommendations for teachers.

Summary

Formative self-assessment with feedback and involvement of the students in determining the criteria of their assessment fosters positive perceptions of self-assessment. From the students' point of view, self-assessment encouraged their responsibility to engage in learning, and enhanced their critical thinking and skills of reflection, and even their achievements. The findings reveal that the students who studied in the courses combining formative evaluation with summative evaluation also held similar views about self-assessment. Consequently, it is recommended that teachers who find it difficult to give up completely on summative evaluation in courses, should combine this with formative evaluation and self-assessment. It is important to take into account the fact that formative self-assessment requires the allocation of a considerable amount of time for feedback. In view of the teachers' workloads, this is a significant limitation and one of the reasons for the limited use of self-assessment. Based on the current study and others, it can be concluded that there is not much room for self-assessment in summative evaluation courses where the students are not involved in determining it, and these students might even develop opposition to it. Therefore, it is recommended that in today's teacher education system, we should work towards greater involvement of the preservice teachers in the assessment process instead of laying down rigid assessment criteria and standards in advance. Student involvement and the provision of feedback will bolster the skills of self-assessment and will both foster and improve their responsibility for learning.

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Appendix: Self-Checklists for the Discussion Chapter

The discussion chapter components and their relative weight: Opening paragraph – 5 points; the body of the discussion – 25 points; the concluding paragraphs – 5 points.

1. Opening paragraph
 - 1.1 Did I write a summary of the key findings to lead to an answer to the study question?
Yes/No/Partly. If you replied No or Partly, please explain why.
 - 1.2 What grade do I think I deserve for the opening paragraph?
2. Body of the discussion
 - 2.1 Did I check to see that there is no unjustified repetition of the findings presented in the results chapter?
Yes/No/Partly. If you replied No or Partly, please explain why.
 - 2.2 Did I repeat the importance of the problem?
Yes/No/Partly. If you replied No or Partly, please explain why.
 - 2.3 Did I evaluate and interpret the results in view of the study question?
Yes/No/Partly. If you replied No or Partly, please explain why.
 - 2.4 Did I stress the similarities and differences between the findings of the current study and findings of other studies?
Yes/No/Partly. If you replied No or Partly, please explain why.
 - 2.5 Did I propose alternative explanations for the results?
Yes/No/Partly. If you replied No or Partly, please explain why.

2.6 Have I drawn conclusions from the results and theoretical and/or practical implications?

Yes/No/Partly. If you replied No or Partly, please explain why.

2.7 Did I point out all the limitations of the study?

Yes/No/Partly. If you replied No or Partly, please explain why.

2.8 Have I suggested directions for future research?

Yes/No/Partly. If you replied No or Partly, please explain why.

2.9 What grade do I think I deserve for the body of the discussion?

3. Concluding paragraph

3.1 Does the paragraph contain a summary of the most important findings?

Yes/No/Partly. If you replied No or Partly, please explain why.

3.2 Did I include comments on the importance of the findings and their educational implications?

Yes/No/Partly. If you replied No or Partly, please explain why.

3.3 What grade do I think I deserve for the concluding paragraph?