# From Murky Salty Water to Crystal-Clear Fresh River Flow: Pre-service Teachers' Assessment Perceptions

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## Abstract

This qualitative study followed the development of 94 pre-service teachers' assessment perceptions in an introductory course on student assessment. Analysis of the students' retrospective and end of course perceptions identified five assessment dimensions. Considerable shifts were detected in each dimension: from summative to formative assessment, from negative to positive assessment perceptions, from perceiving assessment as a simple concept to a complex and multifaceted one, from hierarchical to dialogical perceptions of teacher-student relationships. The findings indicate the potential impact of training in assessment literacy on future teachers' conceptual framework regarding assessment for learning and hold implications for teacher education programs.

**Keywords:** assessment perceptions, assessment literacy, student assessment, pre-service teachers, teacher education

## 1. Introduction

The beliefs teachers hold on assessment theory and practice have been found to play an important role in their implementation, interpretation and overall response to evaluative practices (Brown & Gao, 2015; Moiinvaziri, 2015). Such findings are especially pertinent in view of the assessment paradigm shift that has occurred in the last three decades regarding the objectives for educational assessment, from an accountability-dominant perspective to an increasingly formative one. Formative approaches to assessment enable teachers to understand and track the flow of teaching in order to enhance students' learning. They also allow measurement of the progress made and examination of the integration and implementation of content and skills to determine whether the curriculum works well (Oz & Atay, 2017), ultimately aiming for improving the quality of teaching (Bell & Cowie, 2001; Fabiano, Reddy, & Dudek, 2018). From the students' perspective, the employment of formative assessment practices encourage self-regulated learning which involves students as metacognitive, motivational, and behaviorally active agents in their own learning (Heritage, 2018; Leenknecht et al., 2021), positively impacting students' achievements and motivation (e.g., Hattie & Timperley, 2007; Hondrich, Decristan, Hertel, & Klieme, 2018; Kingston & Nash, 2011). However, the paradigm shift referred to above has created conflicts and tensions amongst all the relevant stakeholders, teachers in particular, regarding the nature, purpose, and effects of assessment (Brown & Remesal, 2012, Cumming, VaFfun Der Kleij, & Adie, 2019; Xu & He, 2019). Findings based on Brown's Conception of Assessment inventory (Brown, 2006) show that these tensions are reflected in teachers' assessment perceptions, as they are expected to gradually move from summative testing cultures to formative assessment conceptualization and practices (e.g., Brown, Gebril, & Michaelides, 2019).

The changing assessment paradigms have thus generated great interest in the development of teachers' perceptions on assessment already in the teacher preparation phase. Overall, there seems to be agreement that teacher education institutions need to prepare teachers for the changes and challenges of the 21st century (Darling-Hammond, Hyler, & Gardner, 2017), and hence, exposure to innovative teaching and assessment approaches seems to be of paramount importance (Kim, Choi, Han, & So, 2012). However, although teacher preparation programs can lead to cognitive and perceptual changes toward teaching practices that use assessment to enhance learning, such changes are not guaranteed, nor necessarily deep-seated (Hill, Ell, & Eyers, 2017; Winterbottom et al., 2008). Teaching and assessment perceptions may be deeply rooted and difficult to change, even with the acquisition of reformed fundamentals of assessment literacy (Deneen & Brown, 2016). This study

therefore strove to shed some light on how pre-service teachers (Note 1) perceive assessment and the possible impact of initial exposure to assessment concepts and methods on the development of their beliefs about assessment. It is situated in the Israeli educational system, a context currently experiencing tensions between accountability requirements, that is compliance with national and international tests conducted on an ongoing basis which determine educational policy and internal assessment practices (Inbar-Lourie & Shohamy, 2021), and the need for instituting a formative assessment culture. Though in the last decade the Israeli Ministry of Education has invested significant effort, issued recommendations, and advanced reforms aimed at promoting the use of alternative assessment methods, testing cultures are still dominant in schools (Inbar-Lourie & Levi, 2020). One of the ways of dealing with this situation is the promotion of pre-service teachers' assessment literacy via assessment courses in teacher education programs. The purpose of this study is to examine the possible impact of initial exposure to assessment concepts via such a course on the development of the pre-service teachers' beliefs about assessment.

## 2. Theoretical Framework

### 2.1 Assessment Literacy and Assessment for Learning (AfL)

Assessment literacy refers to teachers' understanding of the principles of sound assessment (Popham, 2004). In order to carry out both teaching and assessment functions, teachers are required to become assessment literate, obtaining a body of knowledge that comprises basic principles and skills (Fulcher, 2012). The understanding of assessment literacy also emphasizes the critical perspective of the use and abuse of assessment results (Shohamy, 2001), the essential role of context in effective assessment (Oz & Atay, 2017), and the importance of recognizing high-stakes assessments for engaging in assessment discussions (Xerri & Vella Briffa, 2017). A recent conceptual framework proposed by Xu and Brown (2016), based on a review of 100 studies, suggests six component of teachers' assessment literacy: The knowledge base, teacher conceptions of assessment, institutional and socio-cultural contexts, teacher assessment literacy in practice, teacher learning, and teachers' identity (re)construction as assessors.

As part of assessment literacy, teachers are required to be familiar with and understand current approaches and their consequences on teaching, learning and assessment. In the recent decades, a change in thinking about the role of assessment in education has occurred. This change is characterized as a shift from assessment of learning (AoL) to assessment for learning (AfL) (Birenbaum, et al., 2015; Schellekens et al., 2021).

From the perspective of assessment of students, the almost exclusive purpose of AoL is to determine whether the students have acquired sufficient knowledge, skills, etc. This approach has been adopted extensively by education systems worldwide and is aligned with the use of assessment for accountability purposes, usually via tests, hence the term 'testing cultures' (Gipps, 2011). AfL, however, views the assessment process as inextricably embedded within the educational process, to steer and foster the learning of each individual student to the maximum of his/her ability. AfL is designed to help teachers determine what and how well students learn, and how to improve their learning using a variety of formal and informal tools to provide students with formative feedback (Black & Wiliam, 2009; Wiliam, 2011). Previous studies have shown that pre-service teachers graduate with a limited understanding and appreciation of assessment literacy (DeLuca & Klinger, 2010; DeLuca, et al, 2019b; Levy-Vered & Nasser-Abu Alhija, 2015), and feel inadequately prepared to assess their students (Mertler, 2009). Some studies reported an imbalance between assessment literacy and classroom practices, indicating that although the participants were assessment literate, they were unable to demonstrate their literacy in their assessment practices (Jannati, 2015; Oz & Atay, 2017).

### 2.2 Teachers' Assessment Perceptions

Perceptions or beliefs are individual mental structures, value-laden, and subjectively true (Pajares, 1992; Skott, 2015). Teachers' beliefs are complex, multifaceted, and varied (Chen & Cowie, 2016), and different belief systems may function in different ways as filters, frames, or guides to classroom practices (Fives & Buehl, 2012). Findings have repeatedly demonstrated how these beliefs are anchored in concrete conceptual knowledge, personal interpretations of teaching phenomena, and teachers' cognitive and emotional worlds (Thompson, 1992). There is ample evidence that teachers' beliefs influence the quality of their pedagogy, practices, performance, and student outcomes (Levin, 2015; Opre, 2015), and their assessment decisions (Barnes, Fives, & Dacey, 2017).

A series of studies on practicing teachers' conceptions of the purposes of assessment was conducted by Gavin Brown and colleagues. Four major conceptions were emphasized and incorporated into Brown's model (2006). Three of these conceptions can be loosely categorized as "purposes" and one as "anti-purpose": 1) *assessment improves learning and teaching*, 2) *assessment makes students accountable for learning*, 3) *assessment*

*demonstrates the quality of schools and teachers*, and 4) *assessment should be rejected because it is invalid, irrelevant, and negative.* Despite differences in the survey research studies applying the Teachers' Conceptions of Assessment inventory in New Zealand (Brown, 2006), Queensland (Brown, Lake, & Matters, 2011a), Hong Kong (Brown et al., 2009), Cyprus (Brown & Michaelides, 2011b), and Israel (Levy-Vered & Nasser-Abu Alhija, 2015), findings consistently showed that teachers endorsed teaching and learning improvement as their dominant purpose for assessment. More recently, Barnes et al. (2017) expanded Brown's model by adding two new perceptions: 1) Assessment develops students into better people; 2) Assessment is used to control students and teachers.

The research literature points to a reciprocal relationship between teachers' assessment perceptions and assessment practices (Opre, 2015). Positive perceptions of assessment create beneficial assessment practices, while negative perceptions result in the subversion of assessment policies (Deneen & Boud, 2014). For example, Tanzanian mathematics teachers' perceptions of assessment for learning positively predicted the quality of their feedback practices (Kyaruzi, Strijbos, Ufer, & Brown, 2018). In Hong Kong, teachers who believed that school-based assessment would be useful were more likely to report their intention to use this assessment approach in their classrooms (Yan, 2014). In Taiwan, science teachers who viewed assessment as improving learning tended to view science learning as involving increased understanding rather than memorization (Lin, Lee, & Tsai, 2014). Furthermore, several studies claim that assessment perceptions significantly explain teachers' assessment literacy: Teachers who perceived assessment as a tool for improving learning and teaching, tended to demonstrate relatively high assessment literacy, while teachers who failed to see the relevance of assessment or tended to perceive assessment as mainly an accountability tool demonstrated a relatively low level of assessment literacy (Levy-Vered & Nasser-Abu Alhija, 2015).

One of the means for researching teachers' perceptions is the use of metaphors (Craig, 2018). According to Gök, Erdogan, Özen-Altinkaynak, & Erdogan (2012), metaphors are the "most powerful instrument" for unveiling pre-service teachers' perceptions of measurement and assessment (p. 1998). Metaphors can offer a means for learning about one's own thinking and understanding by relating new information directly to prior experience. Metaphors are viewed as a powerful cognitive mapping and modeling mechanism for explaining the world by imagining, thinking creatively, and creating new meanings (Saban, Kocbeker, & Saban, 2007). However, studies of teachers' or pre-service teachers' conceptions of assessment using metaphors are rare. Gök et al. (2012) in one such study, examined 200 pre-service teachers' perceptions of assessment by asking them to complete the sentence: "measurement and assessments are like … because ….". Half of the respondents associated assessment with positive perceptions (such as essential, complementary, richness/depth, and even holism), while the other half expressed negative perceptions toward assessment (such as complicated, subjective, numerical value, fear, and unnecessary). Most of the teachers perceived assessment as "numerical data" ignoring its additional complementary aspects. A similar metaphor study conducted among 53 pre-service and 47 practicing language teachers with different years of teaching experience revealed four main themes: assessment as a formative tool (37%), a summative tool (23%), something agitating (21%), and a sign of self-efficacy (19%) pointing to a tendency to view assessment as promoting learning (Sahinkarakas, 2012).

Another pertinent issue that affects and controls teachers' attention and behavior is the local educational policy (Brown & Harris, 2009; Brown et al., 2019). The greater the pressure exerted on teachers to raise assessment scores (e.g., in Hong Kong), the less likely they are to see assessment as a formative process. Conversely, where educational policies keep the consequences associated with assessment relatively low (e.g., in New Zealand), the endorsement of assessment as a formative tool to support improvement is much greater. Moreover, context, culture, and other local factors play a role in shaping teachers' conceptions of assessment (Brown et al., 2019).

*2.3 The Role of Teacher Education in Assessment*

The assessment literacy of beginning teachers is significantly influenced by the characteristic of training, which consists of acquisition of knowledge, experience, and modeling during the training process (Levy-Vered & Nasser-Abu Alhija, 2015, 2018; Sato, Wei, & Darling-Hammond, 2008). Student teachers who had acquired more knowledge about assessment tended to perceive it more positively (Smith, Hill, Cowie, & Gilmore, 2014). Smith et al. (2014) found that during a teacher education program, New Zealand pre-service teachers' views shifted from assessment as primarily summative to assessment as supporting student learning and informing teaching. Hill and Eyers (2016) reported that 14 out of 22 studies on teacher preparation in assessment included information about perceptions of assessment or assessment self-efficacy.

Research has also uncovered factors that may influence pre-service teachers' assessment perceptions. These include personal histories, student-teacher relationships, opportunities for personalization and deep learning,

notions of relevance, and anxiety issues (Brown & Remesal, 2012; Crossman, 2007; Pajares, 1992). Negative historical experiences, such as failure, disappointment, fear, or anxiety, explained negative perceptions of assessments, unfair grading practices, assessment avoidance behavior, and identity as teachers (Crossman, 2007; Lutovac & Flores, 2022). Additionally, because many teachers perceive the assessment process as being inaccurate, overlooked, and bad, they consider it irrelevant for teaching and questionable in terms of quality (Barnes et al., 2017). Conversely, they have positive perceptions regarding student-teacher relationships as enhancing cognitive learning outcomes and promoting the achievement of goals (Bainbridge & Houser, 2000). However, only a few studies compared the assessment perceptions of student–teachers at the entry point to the assessment course to their later perceptions at the end. Fewer still have done so using qualitative research methods (Eyers, 2014; Smith et al., 2014) based on small samples.

The current study aimed to identify and examine pre-service teachers' assessment perceptions, following an introductory course in student assessment. Using qualitative analysis, with a fairly large sample, the pre-service teachers were asked to express their perceptions on assessment as the end of the course, comparing them retrospectively with their feelings towards assessment before the course had commenced.

The following research question was stipulated: What typifies pre-service teachers' assessment perceptions at the beginning of the assessment course (from a retrospective point of view) and at its end? Have there been perceptual changes, and if so, what are they?

## 3. Method

This study adopts a qualitative phenomenological research design in order to examine pre-service teachers' assessment perceptions (thoughts and metaphors). Phenomenological studies usually aim to reveal and interpret personal perceptions or perspectives regarding a certain phenomenon (Teherani et al., 2015). By examining an experience as it is subjectively lived, new meanings and appreciations can be developed to inform how we understand that experience, thereby affording new insights about a particular phenomenon (Neubauer et al., 2019). The choice of a qualitative research methodology aimed to deepen understanding and broaden the construct of teachers' assessment perceptions. This was done by mapping the participants' answers to direct, general, and intuitive questions about their perceptions using grounded theory methodology which enabled discovery and creation of distinct dimensions. The large data set employed in this study facilitated a broader perspective, as we were able to record the frequencies of different categories of perceptions and the differences in students' retrospective perceptions of how they felt at the beginning of the course versus at the end.

The research design employed is a "retrospective pretest design," considered by some studies to offer a more accurate evaluation of changes in self-reported knowledge and behavior, because it avoids the threat of response-shift bias that might happen when using a traditional pre-posttests design (Pratt et al., 2000). Additionally, the referenced time frame included only one semester to avoid problems associated with a too distant recall period (Beckett et al., 2001).

### 3.1 "Student Assessment" Course Description

An introductory course on student assessment was taught over one semester (14 weeks, 28 hours) for prospective high school teachers of different subject areas. Three groups of 30–40 students each were taught simultaneously according to a similar syllabus by different lecturers, two of whom were also the authors of this research and experts in classroom assessment. The course introduced a broad perspective of student assessment from both theoretical and practical aspects, looking at paradigmatic changes in assessment approaches, purposes of assessment, and principles for valid and reliable assessment. Furthermore, the course aimed to develop critical thinking about Assessment of Learning (AoL) by exposing the students to research regarding its unintended negative consequences. Open discussions were conducted encouraging the students to share their personal experiences as pupils in school, recollections that usually revealed negative conceptions of assessment. Additionally, the course exposed the students to key concepts of assessment for learning and formative assessment that support deeper and more meaningful learning. One of the aims was to encourage the students to adapt to their role as future teachers who integrate AfL into their lessons as part of ongoing instruction. This process means using feedback to improve students' performance and creating a positive assessment culture where mistakes are seen as learning opportunities, and pupils' engagement in the assessment processes is encouraged. This was done through a student-centered teaching approach using various methods including authentic assignments and projects and facilitating cooperative learning. Additionally, class discussions were held regarding assessment perceptions and their implications for assessment practices by providing a model and encouraging reflective thinking.

*3.2 Research Design*

Data were collected from 106 pre-service students (prospective teachers) at the end of the one-semester course on student assessment. For ethical reasons, students were not obligated to answer the anonymous questionnaire used for this research (details below). All students agreed to participate but 12 were excluded as they their forms were incomplete, undecipherable, or deviated from the guidelines. It was emphasized that the data would be used for research purposes only.

*3.3 Participants*

The final research sample included 94 students (77.7% female, 22.3% male) in a teacher education program in one of the largest universities in Israel. The participants had a first or second degree in their teaching track (disciplines pertaining to social sciences, humanities, and the arts). Of the final research sample ($N = 94$), only 31% reported that they were already teaching, and 67% participated in clinical work in a school context.

*3.4 Instrument*

A short, semi-structured instrument was used to collect data. It included relevant background information (gender, teaching track, and teaching experience) and four open-ended questions on assessment perceptions. The first two questions asked the respondents to retrospectively relate their perceptions of assessment at the time of the course commencement. The next two questions were identical but referred to current perceptions at the end of the course. The first question for each point in time (questions 1 and 3) asked the respondents to indicate how they perceived the concept of "student assessment." Questions 2 and 4 were presented in the form of sentence completion, requiring a description of what assessment means to each of the student teachers, encouraging the use of metaphors to convey their thoughts, feelings, and life experiences. The questions were designed based on previous qualitative educational studies that examined perceptions through metaphors (Bektaş, 2019; Gök et al., 2012).

*3.5 Data Analyses*

The participants' assessment perceptions were examined using content analysis, defined as a systematic, repeatable technique in which some words of a text are summarized with smaller content categories based on certain rules-based encodings (Lester et al., 2020). The analysis was conducted in five stages, as follows:

1. *Preliminary coding of participants' perceptions:* Participants' assessment perceptions (answers to questions 1 and 3) were classified into categories by each of three researchers, independently. The metaphors produced (answers to questions 2 and 4) played an important role in validating the classifications, and in the decision-making process of classifying students' perceptions, especially in cases where expressions were difficult to interpret in order to decipher students' intentions. However, it is important to note that the categorical analysis (and determination of frequencies for each category) was not based on the metaphors presented by the participants, but on their direct answers about their perceptions. This is due to the difficulty and complexity of providing an objective interpretation of metaphors. The students' answers often contained several expressions that could be classified into different categories. For example, part of the answer was classified as belonging to one category (like "assessment is unfair"), while the other part belonged to another category (like "assessment is used for sorting pupils"). Therefore, the total number of expressions was larger than the sample size.

2. *Category formation and re-analysis:* After each researcher formulated the categories separately, a process of common thinking was performed, and 19 categories were formulated. Each researcher conducted a re-analysis of all the data at this stage, classifying participants' answers according to these 19 categories.

3. *Assuring reliability:* Inter-rater reliability (IRR) was computed as reliability assurance for this study, whereby consensus was reached among the researchers (McDonald et al., 2019). Reliability was calculated in two steps: 1) For each expression, the number of coded agreements given by the researchers was counted and summarized; 2) The mean of the fractions in the previous step was calculated. The mean, converted to percentage, showed an IRR of 94%.

4. *Category accuracy and frequency counting*: In the cases where no agreement was found between the researchers regarding the classification of a particular expression, a joint decision was made about the appropriate classification. Then, the category names were validated according to the final data analysis. Eventually, the coded data set included a total of 307 expressions (132 referring to initial perceptions and 175 to current perceptions), classified into 19 categories.

5. *Developing conceptual categories and dimensions:* The set categories were combined into nine conceptual categories according to a common subject theme or source. They were then grouped into five dimensions that reflected the same context.

## 4. Results

In total, 307 responses (Note 2) were elicited, 132 for perceptions at the beginning of the course (as recounted by the participants at the end of the course) and 175 for their current end-of-course perceptions. Five dimensions and conceptual categories emerged from the qualitative analysis (see Appendix). The most dominant categories were (in the order of their frequency) complexity of assessment, emotional attitude toward assessment and assessment uses and purposes. Less dominant categories related to teacher-student relationships in the assessment context and criticism of the educational system. Each of the five dimensions was created from a sufficiently rich number of expressions ($24 \leq f \leq 96$), indicating that the student-teachers expressed diverse aspects of the assessment notion at two points in time. Overall, the findings show a prominent difference between participants' initial and current assessment perceptions, reflected in a clear distinction between the frequencies of the conceptual categories for all dimensions. Detailed findings will henceforth be presented according to the five dimensions.

### First dimension: Complexity of assessment notion

A number of categories that relate to the complexity of the assessment process were identified reflecting assessment as simple versus intricate. In their retrospective recollections of how they viewed assessment at the beginning of the course, the respondents tended to refer see the assessment concept as narrow and simple. Conversely, end-of-course perceptions changed to reflect assessment as a rich complex domain, indicating alternative assessment options, describing the multifaceted versatile and multi-dimensional aspects in assessment, noting that assessment emphasizes both process and product, and relating to the possibility that assessment could cater to heterogeneity among learners.

Below are samples of the respondents' replies to the degree of complexity of the assessment concept, according to the thematic categories obtained as part of the data analysis process.

### a. Perception of assessment as a narrow and simple domain

One of the noticeable categories relates to assessment as **A scanty/simple/monotonous/one-dimensional process** mirrored in the respondents' narrow rigid perceptions, along with a minimized and opaque conceptual understanding of assessment. This is reflected in the use of expressions such as "an amorphous concept," and adjectives such as "vague," "intangible," "inflexible," and "static." Additional descriptions depicted assessment as a "one-sided process … [that] follows pre-determined standards," "examines only low cognitive processing," "lacks inspiration," and is "a technical tool." The perceived meager and limited nature of assessment was conveyed via metaphors that portrayed a cold, alien, old-fashioned, outdated reality: Assessment is like "an old man with a bowl hat, a grey worn out jacket…," "driving slowly on a fast motorway …." The teacher in this world is perceived as a merely technical agent, "a quality controller in a large factory," and all one needs to do in order to create a test is "to understand which buttons to push, which data to insert, and a test is ultimately produced".

In addition, a limited number of responses represent the following categories: **Traditional tests as the central method for assessment** where only the grade counts: "achievements are measured only on the basis of test scores … a statistical table where data is inserted and a number characterizing the students' abilities is produced"; and **Emphasis on assessment outcomes**, e.g., "the commitment is to the final product, which is the grade … the process is perceived as irrelevant".

### b. Perception of assessment as a complex domain

Contrary to the unidimensional and narrow views outlined above, expressions at the end of the course portray the complexity embedded in assessment. The most dominant category that the prospective teachers expressed was **Existence of a variety of alternatives to the traditional test,** students emphasized the viable alternatives offered by introducing images which demonstrate choice: "Assessment is like a library, it is possible to find the genre that appeals to me the most, to take it out, check and return it… without having to commit myself to a singular reading direction"; "student assessment is conducted with the assistance of eyeglasses chosen from a wide array of possibilities … one needs to understand and know all the available options, and then choose the most suitable item from this wide assortment." Yet another metaphor depicted "a multi-lane junction, with multi-directional possibilities for both entrance and exit."

It was remarkable to see the prospective teachers shifting their perception to enunciate assessment as a **Diverse/complex/multifaceted/ multi-dimensional process.** The field of assessment was described as "a flexible and versatile area"; "open to abundant possibilities"; "a complex entity with no single measurement criterion." Moreover, at the end of the course, as part of their self-reflection on the process they had undergone, some of the participants shared their transformed awareness of the intricacies involved in assessment. This revelation was expressed via change metaphors and similes: "[prior to the course] my perspective was that of a man about to undergo eye laser surgery …"; "like the melting of a glacier, assessment in education in my case was a frozen and fixed domain, blocked for further development".

The prospective teachers' perception of assessment as a complex process was also reflected in the category **Emphasis on assessing both process and outcomes** which expresses the need for observing and evaluating the learning process (rather than just the product), and catering to student diversity: "It's important for me to evaluate my students throughout learning and not just at the end, so as to assist each one to advance according to their pace by matching suitable assessment methods." Another respondent likened the lengthy, complex process of assessment to a trip "choosing the destination, packing suitcases, boarding the flight, experiencing the actual trip, returning home with all the stories and experiences." The complexity dimension is also reflected in perceptions that converged in the category **Assessment provides a resolution for the diversity between learners** projected for example in image that likened the students to plants, e.g. "Just as we treat plants with devoted differential attention, we also need to educate, teach, and assess our students, …"

The intricate nature of assessment developed at the end of the course also relates to the acknowledgment of the expertise that teachers require to conduct valid assessment procedures: "Prior to this course, I never understood the amount of investment and thought that go into constructing a test and a rubric … Now I comprehend the scientific thinking process behind the assessment scholarship and think that it's only right that teachers should learn it professionally." Another student likened the world of assessment to the field of architecture, noting that as a teacher one needs "to become a professional and develop unique methods … like a designer or an architect," referring also to the merger between the creative and carefully planned nature of the process.

### Second dimension: Emotional attitude toward assessment

Additional categories that emerged in the students' perceptions presented emotional attitudes toward assessment. The categories are divided into those reflecting the negative emotions and positive feelings of both students and teachers. Responses that were provided at the initial phase of the course can be portrayed as arousing negative feelings toward the assessment concept and stressing the passive role of the learner in the process, expressions that were hardly found at the end of the course. Conversely, when reporting their feelings at the end of the course, the dominate expressions associated with the theme of emotional aspects attributed positive feelings toward assessment. The following exemplified students' emotional reactions toward the assessment concept

### a. Negative emotions toward the assessment concept

A noticeable category related to **Negative emotions that arise in relation to assessment**. The student teachers' negative feelings toward assessment at course commencement were associated with images and metaphors that reflect fear, menace, and weakness: "monster, pit, black hole …"; "like a guillotine or death sentence for both the teacher and the student …." Vulnerability and unfairness in assessment-related activities were also present: "torture," "discrimination and deprivation," and lack of clarity, "like salt water that is both murky and salty." Some of the students shared their negative experiences as learners to substantiate these feelings, for example, with reference to test anxiety: "I remember myself as a student, and also see students today who tremble before an exam, who know that their grade on the exam will make a difference and influence their lives in the future." Another respondent shared feelings of uneasy in her future role as a teacher, for "it puts me in a very uncomfortable position where I am required to score my students and to make some of them feel bad about their learning progress". In addition, a limited number of responses represent the category **Learner passivity in the assessment process**: "[assessment is] a unidirectional process, where the teacher develops a test in accordance with his/her pedagogical approach, notwithstanding what the students would have liked to choose."

### b. Positive feelings toward the assessment concept

The most dominant category within this conceptual category was **Positive feelings toward the area of assessment and its afforded possibilities** where the respondents expressed feelings of enjoyment and appreciation at constructing worthwhile, meaningful assessment schemes: Assessment is "… like giving a hug …"; "Like new play-dough that was just purchased from the store, it is hard and not easy to mold and work with, but gentleness and determination will enable loving and devoted hand-design of beautiful creations"; "like a man who runs for his pleasure, but is now running with an MP3 with energizing road songs that provide energy and

motivation to keep him going". Positive feelings are also reflected in images related to the emotional support required to accompany the assessment processes and student growth: "the teacher is a sort of embroiderer of fine textiles"; "an instrument which enables an intellectual dialogue with the learner, and a window of opportunity for original thinking."

Conversely, an additional category related to **The learner as an active participant in the assessment process.** Contrary to the negative feelings expressed by some of the participants regarding the passivity of the learners at course commencement, at the end of the course, positive utterances were generated: "The student … will develop [and will] modify ways of thinking or learning through personal monitoring to create new knowledge." One of the would-be teachers reflectively analyzed his inability to consider students as part of the assessment process in the past and his changed current position: "[In the beginning of the course] I thought that giving the students an opportunity to take an active part in the assessment process is not viable. In addition, I could not imagine that they could be introduced to means to learn how to set personal targets and evaluate their progress." The category **A sense of self-efficacy in assessment ability** was identified as well at the end of the course. The positive feeling of self-efficacy was expressed both with regard to the prospective teachers' confidence in developing new skills, and in their ability to evaluate students in their capacity as teachers in the future:

> I realize that through this process, I am learning to be a better teacher. It is my responsibility to be in charge of their growing process, escort them through the process in an inclusive rather than dismantling manner, which at the same time is controlled rather than loose.

Interesting metaphoric images were borrowed to portray the immensity of the challenge that future teachers face in coping with the professional assessor role on one hand, and the sense of satisfaction when overcoming the obstacles on the other hand:

> Before the course, I perceived the student assessment concept as a high mountain climb. It seemed to be a feasible but very difficult task, one that demands a lot of effort. My greatest fear was the question of how it would be possible to assess in the most accurate manner tests in a subject like history, where there is neither wrong nor right, black nor white, with lots of "in-betweens." During the course, I became aware of the different assessment options and their advantages.

Yet another participant likened her newly acquired self-efficacy in assessment to swimming: "resilience to deep water that now I can swim in (still prefer the land, as an anchor, but am ready to cope with the sea as well)."

### Third dimension: Assessment uses and purposes

Categories that represent the students' responses to the purpose and use of assessment show, that the frequencies were different at the two points in time (retrospective course initiation and real time comments upon completion). About two-thirds of the respondents expressed perceptions at course commencement that mirror assessment for summative purposes such as placement, and determining proficiency for accreditation. The other one-third could be categorized as reflecting formative assessment objectives, such as improved learning and teaching and the provision of continuous input for monitoring and improvement. Analysis of end-of-course perceptions for this dimension, however, did not yield any expressions about summative assessment, with all the responses relating to formative assessment themes. Some examples are provided below.

### a. Summative assessment perceptions

Summative assessment perceptions characterized some of the respondents' beliefs at course commencement when reference was made to assessment used only for sorting out different levels, division into groups, categorization, determining the entrance level of accreditation and determining students' abilities and achievements. In their words, "assessment determines each student's grouping, what chance they will have of being accepted to a particular school specialization or program, a particular high school, academic institution, etc." The metaphors used were technical, for assessment was likened to "taking the car to pass the annual test" and to "a crossword puzzle, a constant simple figure used to place points to assess learners".

### b. Formative assessment perceptions

Expressions attributable to formative assessment were much more dominant at the end of the course than at its initial stage as reflected retrospectively. The perceptions focused mostly on assessment as leverage for **Advancing and promoting both learning and instruction**. One of the respondents remarked, "Student assessment is not a weapon in the teacher's hands and should not serve as a means to threaten students to engage in learning, but rather it ought to serve as a promoting and empowering tool." Another respondent felt that "apt

assessment is the engine for efficient learning." Additional comments emphasized the guidance that assessment can provide for individual students: "assessment should be personal, matched to each one according to his/her progress, facilitate learning and not prevent it …." Another respondent commented, "the marking of trails that guides the students and enables them to see if they are on the right track."

In addition, the responses point to the importance of the teacher in his/her assessor role, and to assessment as meaningful and empowering: "Like a basketball coach who sums up the players' progress, but also provides them with tips for the future, stressing which domains to focus on for the sake of improvement"; "the teacher should act as a mirror and a traffic light, and place road signs along the way."

Another identified formative assessment category is **Assessment for providing ongoing professional information** (validated and reliable). This category refers to collecting and supplying continuous expert information as stated by a respondent: Assessment is "an interaction that requires utilizing and updating a database regularly." Other responses refer to the significance of maintaining high professional standards in assessment for learning: "Assessment is a very professional concept, with quantifiable characteristics and parameters"; "regardless of the success rate … the grade must be evaluated with a rubric."

### Fourth dimension: Teacher-student relationships in the assessment context

Two categories relating to perceptions of the teacher-student relationship with regard to assessment. While at the beginning of the course (stated retrospectively) the perceptions were linked to a hierarchical relationship in which the teacher is positioned above the student, at the end-of-course perceptions point only to the theme of a supportive and dialogical teacher-student relationship.

### a. Hierarchical relationship (teacher positioned above students)

Respondents' expressions in this category point to conservative, hierarchical, and fixed relations. Retrospectively considering the beginning of the course, one of the prospective teachers attested to having felt that the roles and responsibilities had been clearly defined and assigned: "I the teacher administer the test, and you the students submit it to me." The choice of metaphors used, illustrating this assumption and worldview, was drawn from other common hierarchical frameworks, such as the military, the judicial system, and bureaucratic mechanisms; for example, "the teacher is a commander and the student a soldier under his command… a hierarchical system of governance, enforcement mechanism with the learner keeping a low profile." Another military-derived image depicts the teacher as "a general and the student a small pawn in the system, who does not have the capacity to control his/her decisions or change the criteria the system abides by. There is an army commander who constantly looks at the data and does not really see the individual." Expressions related to the judiciary likened school assessment to "evaluating prisoners," and made reference to "a verdict given to the student." Teachers were also likened to judges in competitions "who provide ranking and a score. The teacher in these and other quotes is presented as having almost supernatural powers of control and what can be seen as an aggressive attitude: "A strong giant in the world of midgets"; "the teacher stands on a high mountain and the students below at the foot of the mountain. The teacher hurls tasks and tests at them and flings back the grades."

### b. A supportive dialogical relationship

Contrary to the above, end-of-course perceptions comprised expressions that convey a more equally-balanced teacher-student relationship, whereby the teacher is depicted as supportive, attentive, as someone who provides feedback for improvement and empowerment, and conducts a dialogue with the learners throughout the learning assessment process. "Assessment is the gate or door to communication"; "The teacher needs to be sensitive, attentive, and patient toward the student and try and locate where the mistakes and errors arise to help the student to fix them and improve." The teacher initially described as someone who "flings" or tosses the tasks at the students downhill, is described in this phase as "descending from the mountain to his students and inviting each of them to a personal conversation on the tasks and tests." Rather than "flinging" the grades, "the teacher provides explanations for each assessment …." The relationships presented by the participants at this stage seem more equitable: "A bi-directional cyclic process performed simultaneously by the teacher, the student, and the class peers," "a husband and wife who share a good blossoming partnership … They are here together to create mutual growth … They often give each other feedback for empowerment."

### Fifth dimension: Criticism of the misuse of assessment in the educational system

This theme included critical negative expressions toward the educational system following the misuse of assessment, and was found only in perceptions related to the initial part of the course (retrospectively) in about one-quarter of the cases. Students criticized the system's single-minded focus on producing grades: "A grades factory … The students are workers working to produce grades"; "The tendency is to determine a student's value

based on the grade received, if a student receives a grade of 70, they are worth 70." An image portraying the learner as an object emerges in the following example: "The student is a product examined according to what he looks like and not according to his internal abilities." The descriptions chosen by some of the respondents reflect their criticism of the rigid, static, meaningless, and superficial use of assessment in the educational system, which is based on necessity and not on constructive thought or vision, hence causing harmful effects. The assessment of students' performance in the educational system is likened to "a mother duck followed by a line of ducklings that are aligned in a column. The mother has no idea of where she is headed, leading her offspring to disaster." Future teachers also related to the harmful effects of assessment on individual learners, since "bad assessment can bring about low self-efficacy" and "extinguish curiosity." Notwithstanding this critical stance, the respondents acknowledge the importance of value-laden worthwhile assessment and the need to establish suitable, meaningful assessment procedures in the educational system. Their criticism is therefore directed at the gap between the existing and the envisioned reality: "Student assessment is an unfulfilled potential."

In summary, the thematic analysis of the responses yielded a five-dimensional construct, showing a considerable shift from summative to formative assessment, from negative to positive perceptions of assessment, from assessment as a simple concept to a complex and multifaceted one, and from hierarchical to dialogical conceptions of teacher-student relationships. The last dimension of criticism of the misuse of assessment in the educational system was not apparent at the end of the course. These findings provide novel insights into pre-service teachers' assessment perceptions, as discussed below.

## 5. Discussion and Conclusions

The aim of the research reported here was to typify pre-service teachers' assessment perceptions at the beginning of an assessment course (from a retrospective point of view) and at its end, and to examine if perceptual change had occurred. In addition to delving into the characteristics of these perceptions, we also strove to investigate the possible impact on the respondents' perceptions of an assessment literacy course with an assessment for learning orientation, attended as part of the training program. The findings reflect a rich array of assessment perceptions expressed through the use of metaphors.

The findings indicate the complexity of the assessment concept, as reflected in the student-teachers' perceptions. While some of these perceptions complied with and reconfirmed the previously researched theoretical concept components (aims, validity, and assessment use), a notable number of perceptions unveiled additional concepts scantly represented in the relevant literature. Additionally, the use of qualitative methodology with the contribution of metaphors (Gök et al., 2012), pointed to both covert and overt perceptions of assessment components and provided additional validation and reliability of the findings.

When asked to relate to a current and retrospective timeline regarding their participation in the course, the teacher candidates produced differential perceptions and metaphors, which reflected a transformation in their orientations toward assessment. These findings substantiate previous evidence regarding the impact of introductory assessment courses in teacher education frameworks on novice teacher candidates' assessment perceptions (Levy-Vered & Nasser-Abu Alhija, 2018; Smith et al., 2014).

The uniqueness of this study, however, is that it lies in the qualitative research methodology (using grounded research approach), contrary to most of the previous research which was based on Brown's quantitative inventory. This facilitated the gathering of expressive, vivid, and rich assessment perception data, and the identification of deeply rooted levels of conceptual change regarding assessment, which can broaden the theoretical construct of teacher assessment perceptions.

A major novel finding relates to perceptions regarding the intricacy of the assessment concept. Retrospectively, when considering the beginning of the assessment course, the most frequently expressed perceptions viewed assessment as a narrow, simple, unidimensional, and test-focused phenomenon; by the end of the course, a notable transformation was detected, with the most common perceptions portraying assessment as a complex, versatile, process-oriented domain, one that offers assessment alternatives for diverse purposes and caters to individual needs. Another significant finding was emotional perceptions toward assessment. While the emotional reference at the beginning of the course as expressed in metaphors reflected negative feelings targeted mostly at the educational system, expressing feelings of fear, menace, weakness, and unease at the passive role of students in the assessment process, these were not part of the emotions evident at the end of the course. Positive attitudes were conveyed via metaphors at this current point in time. This change was typified by feelings of empowerment, enjoyment derived from the meaning construction that assessment provides, and acknowledgment of the sensitivity required to support and accompany learners and encourage them to take an active role in the assessment process. An additional layer relates to perceptions of the goals and uses of assessment, particularly

the move from summative to formative assessment for learning and the accompanying features of each orientation. The pre-service students' choice of one orientation versus the other in their retrospective perceptions at course commencement can be linked to their perceptions of teacher-learner relations. While at the beginning of the course, the perceptions reflected a hierarchical relationship with teachers ranked above their students in terms of power and control, end-of-course expressions acknowledged the need to nurture a supportive teacher-student dialogical relationship as part of the assessment process.

In general, it can be assumed that the dominant pre-course perspectives of the prospective teachers demonstrated a testing culture orientation, expressed in tandem with negative emotions toward assessment. It can be assumed that these perceptions were constructed and molded following individual assessment experiences as learners in the educational system (Crossman, 2007). Conversely, evidence at the end of the course points to an assessment-culture-oriented perspective (Inbar-Lourie, 2008; Shepard, 2000), which perceives assessment as a means to advance the teaching and learning cycle. This presumably led to the diminishing of negative perceptions toward the educational system the pre-service students felt at the beginning of the course. This transformation corroborates previous research on the potential impact of teacher education in the area of assessment and evaluation, whereby future teachers become aware of assessment as an integral teacher-led component in the instructional process (Deneen & Brown, 2016; Xu & He, 2019), and carries an important message to these individuals as part of embracing their new teacher identity. Thus, the gap between the retrospective perceptions voiced at the beginning of the course and those at the end, may be attributed to the change process our respondents experienced as the course progressed, shifting their role from learners to teachers and modifying their assessment perspective accordingly, a phenomenon cited in the research literature (Pat-El et al., 2014).

The findings of this study reinforce the paramount importance of imparting knowledge in assessment and addressing assessment perceptions in teacher education programs. As suggested by assessment scholars such as Brookhart (2011) and Shepard (2006), it is essential to reach beyond the mere inclusion of assessment as a pre-requisite teacher education component and probe into the beliefs, values, and attitudes that have given rise to differential assessment perceptions. These emerging perceptions will be based on advanced knowledge in the field, on a deeper understanding of the nature of assessment and its consequences, and on a discourse that will facilitate discussion of the perceptions that arise. Hence, this research reiterates the significance of incorporating designated assessment courses as part of teacher education programs to mitigate student teachers' assessment perceptions. Such courses can provide the would-be teachers with a necessary grounding in assessment literacy, both in terms of the construct being assessed and the methods, including principles of critical ethicality and fairness to avoid bias and ensure equity in assessment (Shohamy, 2001). They will familiarize the future teachers with the AfL culture and 'spirit' to facilitate beneficial effects on learning (Harrison & Wass, 2016) and minimize "testing culture" orientations. Such courses can serve pre-service students in the evolving process of taking on teaching roles and in managing their future dual roles and responsibilities as both instructors and assessors.

In trying to account for the deep transformation that seems to have occurred in the student-teachers' perceptions, we hypothesize that perhaps the assessment orientation of the course contributed by modeling assessment culture principles and tools. These included differential individual and collective evaluation interactions, with substantial and meaningful room for student autonomy, collaboration, choice, and transparency. This is in line with Smith (2016), who emphasizes the modeling role of teacher educators in assessment.

In terms of the research limitations, we acknowledge a possible limitation in the fact that two of the researchers also taught the course. However, due caution was exercised in separating the data collection process from the course activities and adhering to the ethical research methodology. In addition, the fact that the student-teachers' were not asked to attribute the cause of the change can be regarded as a research limitation, and can perhaps constitute a future research direction. A further limitation, which is characteristic of perception research, is the fact that the pre-service students were not actually observed putting into practice their assessment beliefs. The connection between declarative and implemented change in this respect is also a worthwhile direction for future research.

The insights yielded by this study corroborate previous research regarding the need to provide future teachers with the theoretical and practical elements of assessment for learning, as well as fostering a formative "assessment mindset" (DeLuca et al., 2019a) to allow for an informed professional assessment process in their designated educational roles. Additionally, we recommend that assessment courses for pre-service teachers, pay heed to the facets that emerged in the teachers' perceptions. Future research should further explore these perception dimensions in diverse teacher educational contexts and perhaps with reference to different specialized subject areas to validate their relevance and potential contribution to acquiring assessment literacy.

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**Notes**

Note 1. The term 'pre-service teachers' refers to university students who have completed an academic degree and are presently studying for their teaching certificates in a teacher education program.

Note 2. All student teachers' expressions were translated from Hebrew to English by the researchers.

**Appendix. Dimensions, Conceptual Categories, and Categories**

| Dimensions | Conceptual categories | Categories |
|---|---|---|
| Complexity of assessment notion | Assessment as a narrow and simple field | A scanty/simple/monotonous/one-dimensional process |
| | | Traditional tests as the central method for assessment |
| | | Emphasis on assessment outcomes |
| | Assessment as a complex field | A diverse/complex/multifaceted/multi-dimensional process |
| | | Existence of a variety of alternatives to the traditional test |
| | | Emphasis on assessing both process and outcomes |
| | | Assessment provides a resolution for the diversity between learners |
| Emotional attitude toward assessment | Negative emotional attitude toward assessment | Negative emotions that arise in relation to assessment |
| | | A feeling of the learner as passive in the assessment process |
| | Positive emotional attitude toward assessment | Positive feelings toward the variety of assessment tools (alternative assessment) |
| | | A feeling of the learner as active in the assessment process |
| | | A feeling of the ability to assess |
| Assessment uses and purposes | Assessment for summative purposes (AoL) | Assessment for sorting and certification purposes |
| | | Assessment for the purpose of determining students' abilities and achievements |
| | Assessment for formative purposes (AfL) | Assessment for promoting learning and teaching |
| | | Assessment for providing ongoing professional information (validated and reliable) |
| Teacher-student relationship in the assessment context | Hierarchical relationship | A hierarchical relationship (teacher over student) |
| | Non-hierarchical relationship | A supportive and dialogic relationship |
| Criticism of the educational system | Criticism of assessment uses in the educational system | Assessment use damages the educational system |