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**THE RELATIONSHIP BETWEEN SELF-EFFICACY AND
ATTITUDE TOWARDS ASSESSMENT LITERACY AMONG
TEACHERS**

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Abstract

This study investigates to what extent teachers' sense of their self-efficacy in various dimensions (instructional strategies, classroom management, and student engagement) are related to their classroom assessment attitudes and classroom assessment literacy. This study employed a survey design using a set of questionnaires that consisted of 24 items with 9-point Likert Scale to identify teacher's sense of self-efficacy, 31 items with 5-point Likert scale to study the responses of 194 teachers working in secondary schools on their attitude towards classroom assessment, and a 35-item assessment literacy survey. The data were analysed using a descriptive statistical analysis and the structural model's predictive accuracy. The path coefficient values close to +1 represent a strong positive relationship whereas a value near 0 represents a weak relationship: the path coefficient for Teacher's Sense of Self-Efficacy and Teacher's Attitude towards Assessment Measurement was 0.932 which shows a positive and strong relationship. However, the path coefficient for the Teacher's Sense of Self-Efficacy and Teacher's Assessment Literacy was 0.160 which displayed a weak relationship. The results for Teacher's Attitude towards Assessment Measurement and Teacher's Assessment Literacy also revealed a weak relationship as the path coefficient was 0.408. The results of this study show that teachers' sense of self-efficacy, and attitudes toward classroom assessment do not relate to their classroom assessment literacy. In conclusion, teachers need to upgrade their knowledge and skills in classroom assessment in order to realize the objectives of the Ministry of Education Malaysia.

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1. Introduction

Teachers' success in the classroom depended on the teachers' ability to teach confidently to change the students' academic performance and behaviour (Tschannen-Moran & Hoy, 2001). Tschannen-Moran and Hoy (2001, p. 783) defined teacher self-efficacy as a teacher's "judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated." Teaching self-efficacy is often divided into three different domains (i.e., classroom management, student engagement and the adaptation of instructional strategies to the students' needs), all corresponding to teachers' daily tasks in the classroom (Tschannen-Moran & Hoy, 2001). Three types of teaching efficacy identified as efficacy for instructional strategies, efficacy for classroom management, and efficacy for student engagement (Tschannen-Moran & Hoy, 2001). Efficacy for instructional strategies refers to teachers' beliefs in their capability to use several instructional strategies and efficient teaching activities. Efficacy for classroom management focuses on teacher's judgments on ability and skills that required to maintain the classroom order.

By observing the classroom assessment perceptions of the teacher and the approach students take to learn, it is possible to identify the teachers' assessment practices (Tschannen-Moran & Hoy, 2001) by incorporating the perceptions to create better assessment practices to be carried out in the classrooms. Thus, the depth of teachers' perceptions on how to assess in the classroom can be effective for the betterment of the assessment practices which is evident through research that investigated how teachers have the competencies to design and implement quality assessment tasks to construe data and results (Black et al., 2004). Further, studies show how teachers can identify suitable tasks related to the assessment purposes and types to involve students in participating actively in assessing themselves (Popham, 2009). According to Stiggins (1991), assessment literacy is reflected if these competencies are attained through proper guidance.

2. Problem Statement

In Malaysia, there is no documented research on the factor structure of the teachers' sense of self efficacy scale (TSES) and its relationship with other constructs such as assessment literacy and assessment beliefs (Bakar et al., 2012; Hashim et al., 2014). Johari et al. (2009) showed that types of training and teaching experience were important factors that influenced the in-service teachers' sense of efficacy. Demographic factors such as gender and race also act as important variables for in-service teachers' sense self-efficacy (Murshidi et al., 2006). Research using TSES shows that both types of in-service and pre-service teachers demonstrate a high teachers' sense of efficacy (Bakar et al., 2008). These studies provide an empirical base of understanding of Malaysian teachers' sense of efficacy. However, clarity of the factor structure of the TSES has never been conducted especially in relation with assessment literacy and beliefs.

In the Malaysian education scenario, Hamzah and Sinnasamy (2009) stated that although guidelines and objectives were provided by the Malaysian Examination Syndicate, schools in Malaysia did not implement a school-based assessment to assess students' speaking skills in accordance. They resolved that this reflected teachers' incompetency in conducting school-based assessments due to a lack

of knowledge and understanding in implementing the classroom assessment. Studies from the past twenty years show that primarily the assessment knowledge and abilities seem to be generally weak among the teachers (Brookhart, 2011), and is affecting the students' success in the classroom and reducing their motivation level. To implement reform in classroom assessment, the teachers must have a positive attitude in terms of self-efficacy and literacy.

3. Research Questions

This study investigated whether the teachers' self-efficacy influenced teachers' classroom assessment attitude. Furthermore, the extent of the teachers' classroom attitude influence on their assessment literacy was also explored to enable in identifying if the assessment literacy correlates with their self-efficacy.

3.1. Hypotheses

Based both on previous research and on theory emphasizing that self-efficacy, classroom assessment attitudes, and assessment literacy as universal needs, the following hypothesis were proposed;

1. Hypothesis 1: Teacher self-efficacy positively relates to classroom assessment attitudes.
2. Hypothesis 2: Classroom assessment attitudes positively relates to assessment literacy.
3. Hypothesis 3: Teacher self-efficacy positively relates to assessment literacy.

4. Purpose of the Study

The primary aim of this study was to determine Malaysian secondary school teachers' self-efficacy and the secondary purpose is to investigate the teachers' attitudes towards classroom assessment and their assessment literacy. Studies about teachers' self-efficacy and assessment attitude impact on assessment literacy in Malaysia were limited. Thus, this study contributed to the existing knowledge of how self-efficacy and assessment beliefs of teachers is related to assessment literacy among Malaysian school teachers. This study was to identify the level of secondary school teachers' self-efficacy, classroom assessment attitude, and classroom assessment literacy by;

1. linking teachers' self-efficacy with their teachers' classroom assessment attitudes
2. examining the extent of teachers' classroom assessment attitude influence on classroom assessment literacy among teachers
3. correlating teachers' assessment literacy with their self-efficacy level

5. Research Methods

Data acquired through the administration of the Teacher Sense of Efficacy Scale (TSES), Bryant and Barnes' (1997), Attitude towards Educational Measurement Inventory' (ATEMI) and Mertler's (2003) Classroom Assessment Literacy Inventory were analysed using descriptive analysis. The SPSS

(Statistical Package for Social Sciences) 21.0 software program was used to analyse the data. The scoring instructions provided by the authors Megan Tschannen-Moran and Anita Woolfolk Hoy were adhered to analyse the data for the TSES accordingly since the instrument originates with the exact directions on how to provide scores for the items. Data was collected from 194 teachers who are teaching in Malaysian Education Ministry secondary schools. The criteria for selecting the participants for the study was voluntary participation by the teachers from all the disciplines. The overall self-efficacy of teachers was determined through the answers which were considered as a whole-instrument. A specification of a model based on theory and research using Smart PLS-SEM was utilized to see the correlations between; teachers' self-efficacy level and teachers' classroom assessment attitude; teachers' self-efficacy level and teachers of their assessment literacy; teachers' classroom assessment attitude and teachers' assessment literacy.

6. Findings

6.1. Results of teachers' sense of efficacy scale

Based on the descriptive statistics presented in Table 1, the study shows that teachers' responses displayed a high sense of self-efficacy on their perception of their self-efficacy. On average ($M = 9$), the participants stated that they strongly agreed with the statements. These show that the teachers realize their daily life activities related to their self-efficacy in their class. From the 24 items under this scale, the mean score of item number 23 showed the highest mean ($M = 7.11$). Next items 11 and 15 had the lowest mean score ($M = 6.70$) except for item 22 which asked the teachers' response on the ability to assist the families in helping their children to do well in school had the lowest mean where the M was 4.10. After analysing the teachers' response for the TSES section, the average efficacy level for teachers in this study was found to be between $M=6.70$ to $M=7.11$ and the median of response for all items chosen by the teachers was 'a great deal of influence' for all the items. Teachers in this study have a high sense of efficacy in their strategies for classroom instruction ($M = 6.96$), in the management of classrooms ($M=6.87$), and in their engagement with the students ($M=6.55$) as displayed in Table 1 It shows that the teachers perceived that they had quite a bit of influence on students' learning.

Table 1. Results of teachers' sense of efficacy scale for different dimensions

Dimensions	No	Mean	
		Minimum	Maximum
Strategies in Classroom	8	6.77	7.11
Instructional Management of Classroom	8	6.70	7.01
Engagement of Student	8	4.12	7.01
Total N	24		

6.2. Analysis of attitude towards Educational Measurement Inventory (ATEMI)

Responses from the teachers for ATEMI displays the mean of percentage scores for the item 'I have no antagonistic feeling toward measurement' as the highest, with 78.4% of the teachers stating they strongly disagreed and, for item 8 only 3.6% of the teachers agreed with the statement which was

recorded as the lowest. Based on the average means in Table 2, 43.53% of teachers have responded that they strongly agreed and 5.25 % agreed with the items in the 'Usefulness of Measurement to Teaching' dimension. However, 41.8 % strongly disagreed and 9.01 % disagreed with 6.3% maintaining a neutral stand. This suggests that teachers are divided in their perception about the usefulness of an assessment. For the second dimension as highlighted in Table 3, for the teachers' reaction emotionally regarding quantitative features of the measurement course, 44.2 % of the teachers stated they strongly disagreed and 26.7% disagreed as to their response for the items. On the other hand, 24 % responded that they strongly agreed and 6.17% agreed whereas 4.05% were neutral. The negatively worded items elicited a positive response displayed by the teacher's attitude about measurement in the assessment. Further, the data in Table 4 shows that in the dimension of 'Willingness to Take More Courses in Measurement' 24.1% of the participant strongly disagreed and 14.2% disagreed followed by 46.5 % who strongly agreed and 11.1 % agreed, but 7.8 stayed neutral as their responses for items in this dimension. The percentages denote that teachers are less likely to go or willing to go even if given the choice to attend courses to expose them to measurement in assessment.

Table 2. Usefulness of measurement to teaching

	SD	D	N	A	SA
Mean	41.8	9.01	6.3	5.25	43.5
Median	36.6	10.8	3.6	3.6	52.6
Minimum	10.8	3.6	3.6	3.6	7.2
Maximum	67.5	14.9	14.4	7.7	71.1

Table 3. Emotional reactions to the quantitative aspects of the measurement course

	SD	D	N	A	SA
Mean	44.2	26.7	4.05	6.17	24.
Median	46.6	26.3	3.60	7.20	19.8
Minimum	18.0	19.1	3.6	3.6	10.8
Maximum	55.7	29.9	7.2	10.8	78.4

Table 4. Willingness to take more courses in measurement

	SD	D	N	A	SA
Mean	24.1	14.2	7.80	11.1	46.5
Median	19.8	12.8	5.40	11.0	56.2
Minimum	3.6	7.2	3.6	7.2	10.8
Maximum	45.4	23.2	18.0	15.5	63.4

SD=strongly D= disagree N=neutral A= agree SA=strongly

6.3. Analysis for classroom assessment literacy inventory

This inventory measures the accuracy of the answers to estimate the teachers' literacy in classroom assessment. Based on the average correctly answered scores, Table 5 shows the mean for correct answers for the Classroom Assessment Literacy Inventory as 62.63 and multiple modes were ranging mainly between 60 to 65 that was recorded. Table 5 displays the individual scores of all the items in the

Classroom Assessment Literacy Inventory. The maximum for correct answers score was 89 and the lowest was 28. Although the teachers portrayed a high sense of self - efficacy but their literacy in the assessment was low.

Table 5. Classroom assessment literacy inventory (correctly answered items)

N	35
Mean	62.63
Median	68.00
Mode	60
Minimum	28
Maximum	89

6.4. Results of the structural model

By measuring the amount of discrepancy in the dependent variables of the model, the explanatory power of the model can be evaluated (Hair et al., 2013). They explained that the essential measures for assessing the structural model are the R-squared and the path coefficients. The model has an R- squared value of 86.8%, indicating a strong explanatory power of the criterion constructs on the outcome construct, i.e., the teachers' attitude towards educational measurement. The path coefficient value as in Figure 1.

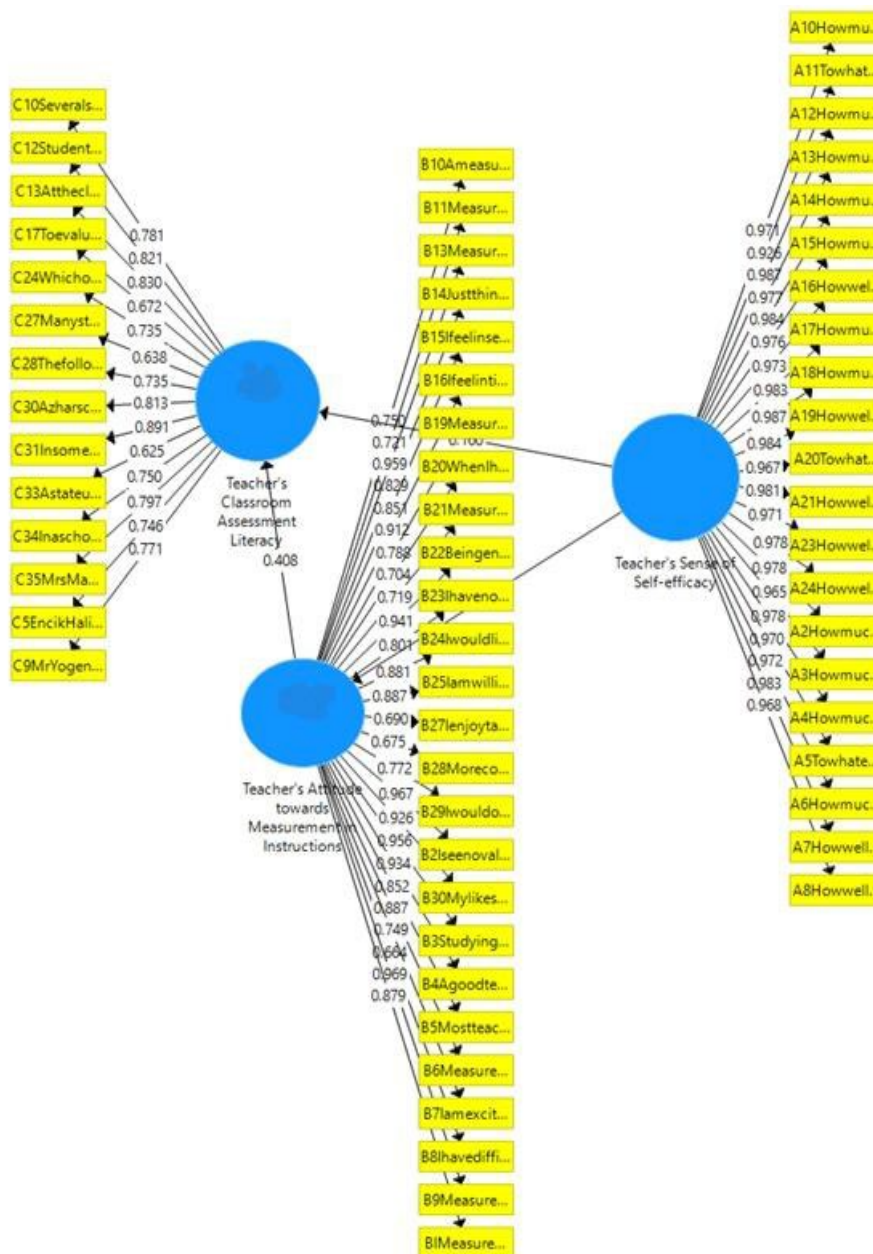


Figure 1. Path coefficients teachers' perceived sense of self-efficacy, teacher's classroom assessment literacy and assessment literacy

6.5. Path coefficients teachers' perceived sense of self-efficacy, teacher's classroom assessment literacy and assessment literacy

Table 6 demonstrates the p-values and path coefficients for each hypothesis in terms of path analysis. As the first hypothesis is supported, which in turn indicates that the path is significant between the variables. So ($b = 0.932$, $p < 0.05$) the path between the teacher's sense of self-efficacy and the teacher's attitude towards educational measurement indicates that the sense of self-efficacy of the teachers shows a positive attitude towards the educational measurement. Next, shows the path ($b=0.408$, $p < 0.05$) between the attitude of teachers towards educational measurement and classroom assessment

literacy leverages moderately but it still shows that there is a relationship between the classroom assessment literacy of the teachers and their attitude towards educational measurement. The path ($b = 0.160$, $p < 0.05$) between the sense of self- efficacy of the teachers and their classroom assessment literacy exposes that their sense of self-efficacy influences the classroom assessment literacy indicating that the third hypothesis is supported. The low path coefficient value between the perceived teacher's sense of self-efficacy and classroom assessment literacy ($b = 0.160$), depicts the real situation in the education environment that can be interpreted as the participants are extremely efficient teachers with a high sense of self-efficacy but their assessment literacy does not reflect a strong relationship. This explains the lack of exposure of the teachers to the current assessment methodology and their lack of awareness that the need for assessment training in improving student's achievement.

Table 6. Path coefficient

Construct relations	Path coefficient	
	Teacher's Attitude towards Assessment Measurement	0.932
Sense of Self- Efficacy of Teachers	Teacher's Assessment Literacy	0.160
Teacher's Attitude towards Assessment Measurement	Teacher's Assessment Literacy	0.408

6.6. Hypotheses

This research model proposes three hypotheses that evaluate the relationships between the variables. Running the PLS algorithm in SmartPLS software provided the path coefficient of these relations which denotes the strength of the relationships and P-value for verifying whether the relations are statistically significant:

- 1.Hypothesis 1: Teacher self-efficacy positively influences the teacher's classroom assessment attitude.
- 2.Hypothesis 2: Teacher Classroom assessment attitude is positively linked to assessment literacy.
- 3.Hypothesis 3: Teacher sense of self-efficacy and Classroom assessment attitude positively influence teachers' assessment literacy.

The direct effects of self-efficacy and teachers' attitudes towards their assessment literacy are statistically significant. Also, the study reveals that drawing on teacher's responses for assessment literacy and their perception of the sense of self-efficacy is related to their attitude towards classroom assessment. These analyses show the hypothesis that classroom assessment attitude positively relates to assessment literacy, and teacher's self-efficacy and classroom assessment attitudes positively relate to the teachers' assessment literacy are supported moderately. Teachers in this study show a high sense of self-efficacy and show a positive attitude towards assessment. However, they have a low level of assessment literacy which could be rectified through various measures.

7. Conclusion

This research can provide awareness to the state and district education department to conduct workshops and training for the teachers to design assessment and understand the concepts so that the

competency of teachers in classroom assessment can be developed. To equip teachers with current knowledge about assessment, there should be a modification in the teacher education programs especially the knowledge and skills needed to develop assessment tasks. This knowledge and skill are essential for the teachers to be able to have the ability to appraise high order thinking skills of the students, besides measuring their proficiency and learning progress (Cizek, 2000). Research from various countries repeatedly shows incompetency and ill-prepared teachers who are unable to interpret the results of various types of assessments (Alkharusi et al., 2011). Similarly, this present research too had found the same results since teachers' assessment practices were often not well aligned with their instructional goals just as Ogan-Bekiroğlu (2009), Ogan-Bekiroğlu and Suzuk (2014), who found gaps between practice and theory concerning assessment literacy. They recommended that programs for teacher education should highlight assessment theories, evaluation categories, besides informing the teachers about the importance of assessment validity with reliability. If these changes can be done in the teacher education programs, it will enable the teachers to supervise the students' engagement in both traditional and performance-based assessment methods. Furthermore, if the teachers are provided with this knowledge, they can practice by reflecting and revising these methods.

In the Malaysian assessment context, as an example: teachers focus on reading and writing to improve language proficiency, at the expense of speaking and listening because they believe scores could be raised. So, students' performance in their proficiency in reading and writing cannot be correlated to the student's performance in speaking and listening. Thus, teachers with high self-efficacy see obstacles such as this as challenges that can be solved, and when noticing difficult tasks as threats to be avoided, teachers will be able to see the importance of instructional strategy to incorporate all the skills to achieve language competency of the students (Bandura, 1977). Efficacious teachers have the innate ability to influence and challenge themselves because of their belief and they can visualize their success in whatever they do (Paglis & Green, 2002). So if they are equipped with assessment literacy knowledge, they will embrace new ideas by trying new strategies to meet their students' needs, subsequently improving their classroom instructional methodology and assessment practices (Tschannen-Moran et al., 1998). Furthermore, if the teachers' sense of self-efficacy can be increased through supportive leadership who can provide professional development to teachers, schools can expect an improvement in the students' performance (Hoy & Hoy, 2003). Consequently, a supportive environment is essential for adjustment to happen, because the teachers might go back to their previous classroom instructional methods and strategies. This is also to make sure that teachers do not feel compelled to do something that they are not competent in and stop moving forward (Goleman et al., 2002).

By collaborating with teachers, leaders, and authorities in the educational environment can recommend programs for teachers' professional development to cultivate a supportive culture for the transformation of the teachers. Teachers can increase their level of self-efficacy if, during these professional development programs, teachers, leaders, or administrators can deliver the knowledge for successful input because they are reliable sources of feedback for the teachers (Marzano et al., 2005). Besides that, some teachers with a high sense of self-efficacy usually exercise some form of influence when implementing innovations together with their colleagues (Rogers, 2003). For the evolvement of the instructional culture in schools to undergo a positive change, timely and appropriate pressure from

respected peers together with the support from the institution leaders can be effective (Fullan, 2001). When teachers practiced what they have learned, their sense of personal efficacy grows while experiencing success with students (Hoy & Hoy, 2003).

Specifically, effective classroom management is consolidated with innovative teaching methods to set higher learning goals for students by teachers with high self-efficacy beliefs (Wolters & Daugherty, 2007). Professional development programs should be done because they are an essential aspect of teachers' professionalism that can increase the self-efficacy among teachers (Ross & Bruce, 2007).

7.1. Limitations

Consequently, more researches are needed into the design, implications, and meanings of problem-based teaching efficacy. One precise area of focus is defining suitable gradations of challenges and relevant problems of practice for both inexperienced and experienced teachers. Most teachers sensed themselves as highly efficacious to provide alternative explanations when students are confused. Another ensuing area of research is whether self-efficacy for solving problems is intensely related to burnout and satisfaction as other forms of TSE (Skaalvik & Skaalvik, 2010). To summarize, there is indefinite knowledge about the meaning of teachers' efficacy beliefs concerning the student's learning outcomes, student's achievement, and years of teacher's teaching experience or past learning experiences in Malaysia. Irregularity in identifying the true meaning of teaching tasks and its relation to student's learning outcomes continue to limit the conclusions of this study.

7.2. Suggestion and recommendation

As the study was performed in only a specific demographic area, particularly, in the southern region of West Malaysia and based on voluntary self-report through Google form survey, generalizing the results of the study in all areas of Malaysia should be threaded with caution. To gain a deeper insight, it is necessary that exploring the extent of assessment literacy knowledge to improve teachers' training and students' learning should be focused on future studies by using other constructs. The priority of future studies should be to identify the connection between future teachers' training syllabus and the current assessment practices. Use of longitudinal design will be a better way to understand the development because the present study used a cross sectional survey design.

Based on the findings, this study suggests the establishment of organized support to foster assessment literacy among teachers. Embedding classroom assessment as a subject with extra credit hours in the curriculum of teacher training colleges and education faculties will be the most important factor that will increase awareness about classroom assessment and authentic assessment approaches in the Malaysian education environment. Furthermore, educational authorities through continuous reinforcement for senior teachers to refresh their knowledge will be a motivating factor for these teachers to increase the knowledge in assessment literacy.

A continuous program-level engagement with assessment may be required. Through that engagement, students' ideas of assessment must be addressed too. As a result, teacher education programs may have to transform structure and content of their syllabi while researchers can do the similar with discussions of assessment literacy theoretically. Changes to theory and teacher education are not enough

if rigidities in practice remain unresolved. To be an assessment literate, teacher requires knowledge, skill, and beliefs applicable to the context in which assessment is organized. Concentrating exclusively on theory and teacher education, without considering the power of policy and context is worthless. Rather than influencing teacher beliefs towards callously practical but inadequate practice, this study suggests that there should instead be call for assessment policy and practice to better align with more reasonable and beneficial results. While this may never remove essential pressures, doing so may at least make such pressures endurable as teachers conceptualize and practice assessment.

Teachers should undergo in-service trainings on how to prepare the many forms of assessments (e.g., formative, summative, alternative, creative, interdisciplinary and collaborative assessments). Assessment for learning ensues in all phases of the learning process, therefore, the teacher and student must work together to demonstrate the student's knowledge and apply what was learned. Also, using assessment results for conveying grades and how to efficiently connect them to students and parents should be included in teachers' professional development programs. This is gradually important since education in all levels in many institutions is moving to societal accountability and responsibility mechanisms which can be done through reforms in assessment practices. Without the understanding of teacher's assessment literacy, how assessment practices are influencing students' study strategies and learning processes will remain unidentified. As shown in this study, teachers want to know how assessments for formative and summative classroom purposes can be carried out and are willing to attend courses because of their high level of self-efficacy. But discouragement on communicating results of assessment to the students and parents suggest an uneven intention and conception of assessment for school accountability purposes. The findings point to teachers' mixed understanding that assessment of student learning is a dynamic component of an effective educational accountability.

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