

Assessment in the New General Education Curriculum in Vietnam: A Proposal for Developing Instruments Using Psychometric Theories

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ABSTRACT: Vietnam's 2018 general education curriculum has been developed according to the competency approach. As a result, the instruction and assessment systems need to be adapted to align with the requirements of the new curriculum. Experience from other countries shows that one effective solution is applying psychometric theories in different assessment programs. In this paper, the educational assessment system in Vietnam will be introduced along with the history of psychometric theories, especially Rasch measurement, in Vietnam. After rehearsing some illustrated studies using psychometric theories as well as identifying some challenges of this field in the context of curriculum innovation, a proposal for developing instruments using psychometric theories will be discussed in relation to the requirements of assessment in the new general education curriculum in Vietnam.

KEYWORDS: standardized testing, measurement, psychometric theories, 2018 curriculum, Vietnam.

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1. Introduction to the Educational Assessment System in Vietnam

The educational assessment system in Vietnam can be divided into three components: classroom assessment, examinations, and large-scale assessment. In the area of classroom assessment, the Ministry of Education and Training (MOET) provides general instructions for teachers to assess their students' learning in terms of assessment purposes, assessment content and methods, designing tests for summative assessment, and reporting students' assessment results. For example, at the primary education level, the Ministry of Education and Training issued Circular 27/2020/TT-BGDĐT to guide primary school teachers in implementing formative and summative assessment within classroom assessment. This Circular also requires teachers to assess students' competencies that have been identified in the new curriculum (Minister of Education and Training, 2020).

In terms of examinations, Vietnam has end-of-period examinations for Grade 5 students (to move to the lower secondary level), Grade

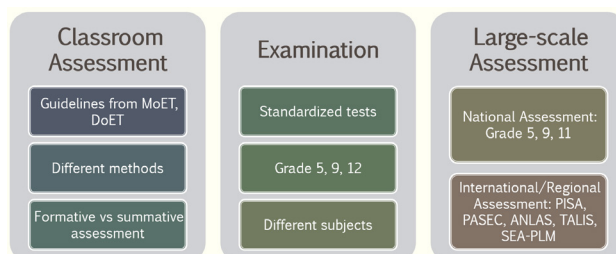


Figure 1. Educational assessment system in Vietnam

9 students (to move to the lower secondary level) and Grade 12 students (to graduate from the general education level). However, apart from the graduation examination for Grade 12 students, designed by the MOET, the Department of Education and Training or schools will be responsible for the examinations for Grade 5 and Grade 9 students. Relevant agencies have chosen different subjects for each year and each Grade level.

MOET Vietnam has also conducted many national assessment programs and participated in international and regional assessments. With national assessment, Grade 5, Grade 9 and

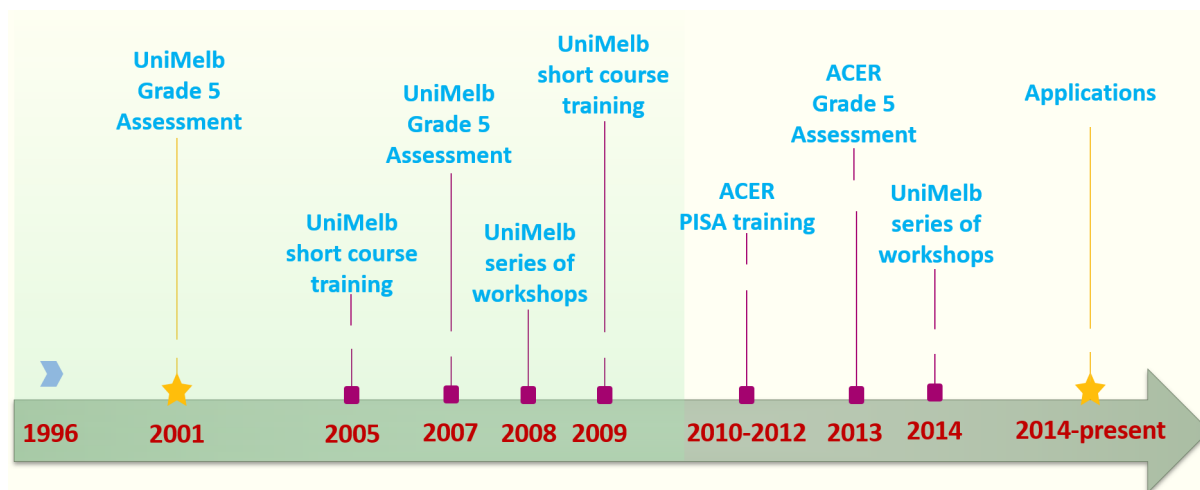


Figure 2. A timeline of Rasch measurement applications in Vietnam (Ministerial level)

Grade 11 students have participated in periodic assessment programs. In these programs, students took tests for specific subjects (e.g., Math and Vietnamese language for Grade 5 students in 2001, 2007, and 2011; Math, Vietnamese language, English, and Biology for Grade 9 in 2013). Students have completed their tests and background questionnaires. In those assessment programs, Rasch measurement has been applied to analyze the test data. With the international and regional assessment programs, Vietnam participated in the Programme for International Student Assessment (PISA) and Teaching and Learning International Survey (TALIS) from OECD, Programme d'analyse des systèmes éducatifs de la CONFEMEN (PASEC) from CONFEMEN, The Southeast Asia Primary Learning Metrics (SEA-PLM) and the Analysis of National Learning Assessment Systems (ANLAS) from UNESCO. Vietnam national teams have participated in different stages of those programs. Evidence from the results of those programs helps policymakers, educators and stakeholders to take action to improve the quality of Vietnam education system.

In terms of the history of applying psychometric theories in Vietnam, some Vietnamese scholars had become acquainted with Rasch measurement through different courses before 1996. At the ministerial level, one of the main milestones was applying Rasch measurement in the national assessment for Grade 5 students with support from the University of Melbourne in 2001. This

assessment used Rasch measurement to analyze both pilot and main data for reporting purposes. Then, Vietnamese scholars had a range of opportunities to participate in different capacity-building workshops and training to improve their knowledge and skills with ongoing support from the University of Melbourne and ACER from 2005. Another key milestone in this process was attained with the participation of MOET Vietnam in PISA 2012. Figure 2 shows a timeline for adopting and applying psychometric theories in Vietnam at the ministerial level.

Since then, the capability of many scholars in this field of study has been improved, and many studies relating to psychometric theories have been implemented. The next section will provide some results from those studies.

2. Featured studies using psychometric theories in Vietnam

2.1. Comparison scores among 2001, 2007 and 2011 in Grade 5 assessments

MOET Vietnam implemented the national assessment of learning outcomes of Grade 5 students (in Mathematics and Vietnamese language) in 2011. This was the third survey, following those in 2007 and 2001. One of the purposes of this project was to compare students' achievement in three cycles (Ministry of Education and Training, 2014). In order to do so, since the 2007 item difficulty values were previously equated and presented on the logit scales set up in 2001, the equating procedures in

2011 were conducted using the 2007 logit scales. The link between the 2011 and 2007 tests (for Mathematics and Vietnamese) was examined using differential item function (DIF) analysis of the link items. Figure 3 shows the results for mathematics. The mean difference in the difficulty estimates of the anchor items included in the equating item set and the standard error of this mean were calculated.

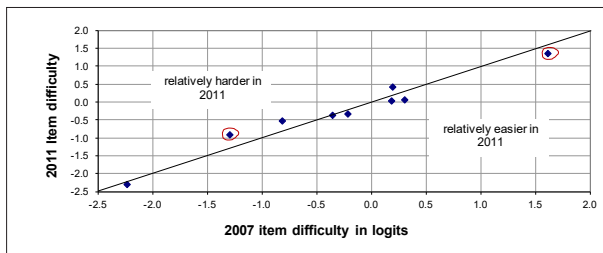


Figure 3. Differential item functioning between 2011 and 2007 mathematics tests

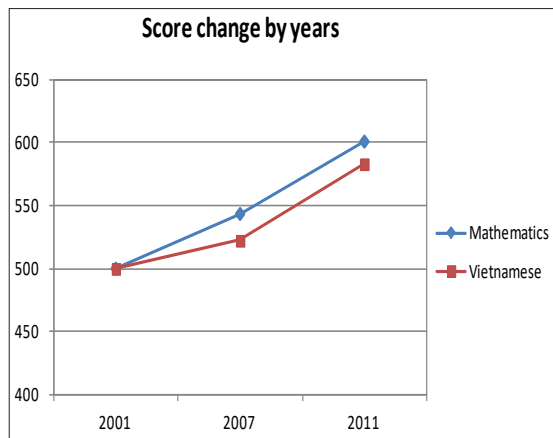


Figure 4. Changes across three cycles

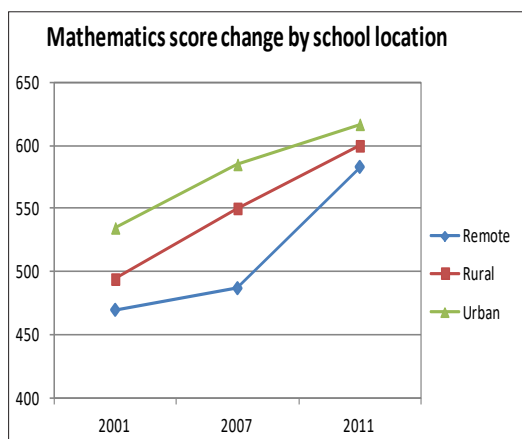


Figure 5. Changes by school location

2.2. Assessing intellectual development based on Sternberg's Triarchic Theory

This study reviewed the literature to propose a framework to assess Vietnamese students' intellectual and competence development based on Sternberg's triarchic theory of intelligence (Nguyen. et al., 2022). The study discussed the theory of multiple intelligences and types of intelligence, developed an assessment framework, developed instruments to measure students' intelligence and capacity, and tested results on students' intellectual ability and capacity development. A sample of 1,283 students participated in this study. Figure 6 provides the assessment model for the study.

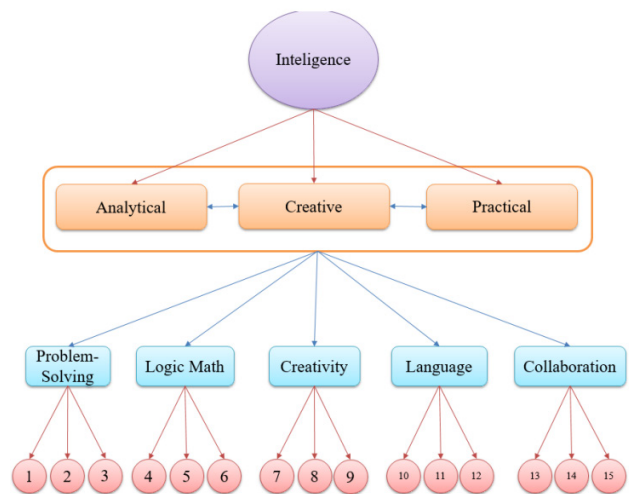


Figure 6. Model of assessment based on Sternberg's Triarchic Theory of Intelligence

Rasch analysis was applied to explore the students' data. Figure 7 shows the results of the item-person maps on students' general intelligence factor 'g' and intelligence components with the item difficulty. It can be seen that there is a relatively standard balance between the distribution of the ability of students and the item difficulty.

2.3. Exploring Numeracy skills of students in mountainous areas

The Vietnam Ministry of Education and Training has proposed that numeracy is considered an essential competency that needs to be developed for all students. However, little is known about the numeracy of students

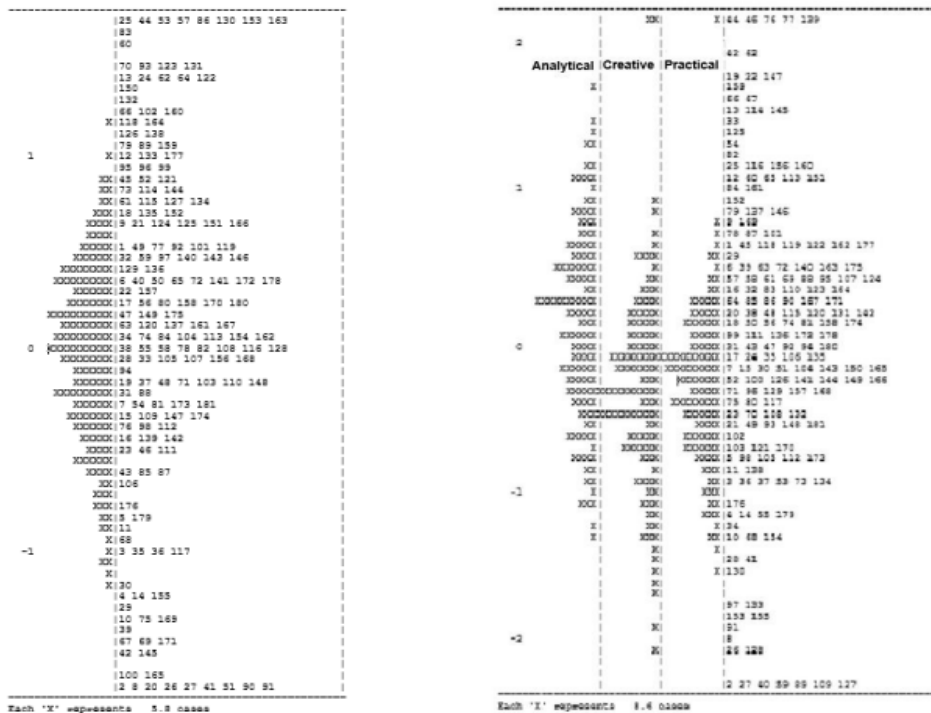


Figure 7. Item-person maps for general intelligence and intelligence components

in general and those in remote mountainous areas of Vietnam. This study aimed to design an assessment to measure the numeracy competency of students in mountainous areas to understand their performance in numeracy (Cao. et al., 2022). The study used a quantitative approach.

model and could be used to describe numeracy learning progression with different proficiency levels. The tests were reliable and valid, and the anchor items were good for connecting students' competency among grades. Figure 8 shows the relationships between common items within two tests. The results also showed that Vietnamese students in mountainous areas tended to perform better in Arithmetic and Algebra problems than in problems relevant to their lives. The results provided convincing evidence of the practical performance in numeracy of students in various ethnic minority groups in Northern Vietnam.

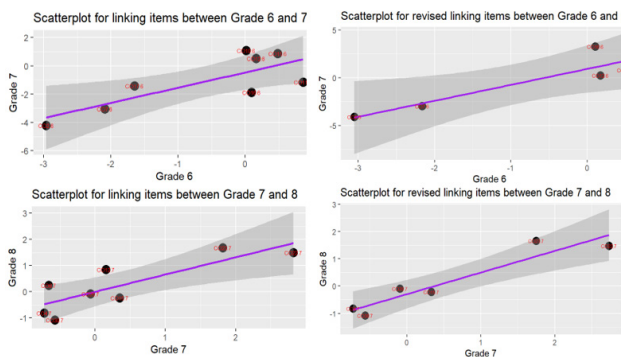


Figure 8. Relationships between common items across the two tests

A sample of 730 students in grades 6-8 from eight provinces in the mountainous areas of Northern Vietnam was recruited to participate in the study. A numeracy framework and three tests with anchor items were designed and developed to measure students' numeracy. The analysis results using an approach to the Rasch model showed that the items fit well with the

3. New general education curriculum and challenges

3.1. Overview of new general education curriculum

The 2018 general education curriculum (Ministry of Education and Training, 2018) has been developed according to the competency-based approach, which requires focusing on developing five characteristics (Patriotism, Kindness, Hardworking, Honesty, Responsibility); three general competencies (Autonomy and self-study, Communication and cooperation, Problem-solving and creativity); and seven specific competencies (Language,

Numeracy, Science, Technology, Informatics, Aesthetics, and Physical Education) through 14 specific areas of learning and educational activities (Figure 9). With the introduction of the 2018 general education curriculum and the requirements for GDP renewal, important issues for the change of content, methods, and forms of assessment have also been raised to meet the curriculum requirements.

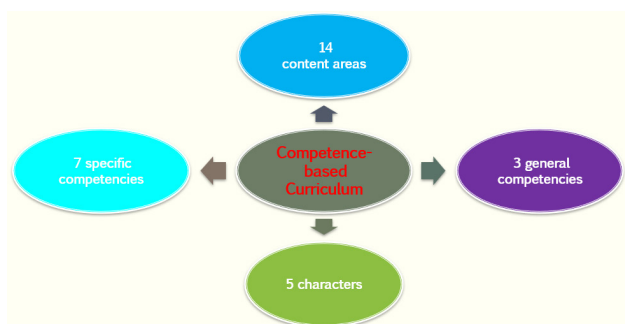


Figure 9. Components of the new general education curriculum in Vietnam

3.2. Current situations and challenges

Assessment is integral to the teaching-learning process, facilitating student learning and improving instruction, and can take a variety of forms (Manitoba Education - Citizenship and Youth, 2006). Classroom assessment is generally divided into three types: assessment for learning, assessment of learning and assessment as learning (Figure 10). Assessment for learning is the ongoing assessment that allows teachers to monitor students on a day-to-day basis and modify their teaching based on what the students need to be successful. This assessment provides students with the timely, specific feedback to adjust their learning. Assessment of learning is the snapshot in time that lets the teacher, students and their parents know how well each student has completed the learning tasks and activities. It provides information about student achievement. While it provides useful reporting information, it often has little effect on learning. Assessment as learning develops and supports students' metacognitive skills. This form of assessment is crucial in helping students become lifelong learners. As students engage in peer and self-assessment, they learn to make sense of information, relate it to prior knowledge and use

it for new learning. Students develop a sense of ownership and efficacy when they use teacher, peer and self-assessment feedback to make adjustments, improvements and changes to their understanding. In Vietnam, teachers are most familiar with the assessment of learning.



Figure 10. Three pillars of assessment

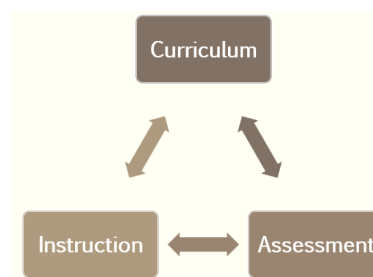


Figure 11. Three pillars of education

In educational settings, curriculum, instruction and assessment go hand in hand, working for the success of student achievement (Scott, 2016). In considering the interrelationship between curriculum, instruction and assessment, as well as how and when to differentiate them, we have to engage in constant reflection and observation to be cognizant of our students' knowledge, skills and abilities to make informed decisions on what aspects of the curriculum they know and need to know, how they will be taught the selected content and how all will know that they are learning or have learned. Therefore, in designing lessons, we follow the goals from the curriculum, which will encourage students to be motivated to achieve the outlined objectives as we instruct them and then reflect on that instruction as we assess them (Baxter, 2012). This is also a challenge for Vietnamese teachers; many still think that assessment is the final stage in the education process.

3.3. Proposals for developing instruments using psychometric theories

Figure 12 provides a proposal for the design of instruments using psychometric theories.

1. For standardized assessments, including exams and wide-ranging assessments, psychometric theories should be used to develop standardized tests and to develop item banks to gradually implement computer-based adaptive assessments.

2. The application of psychometric theories in examinations, especially for the National high school graduation examination, is crucial. One of the challenges for this examination from 2025 is that it will be conducted under the 2018 general education curriculum, whereby its main purpose is to confirm the attainability of the competencies and characters specified in the curriculum. Therefore, the test needs to be developed in the direction of standardization and assessment of key competencies.

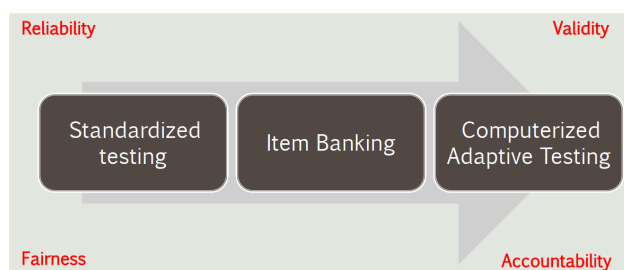


Figure 12. Proposed model for developing instruments using Rasch measurement

3. For the national assessment programs, assessment frameworks under the 2018 general education curriculum will also need to be developed as a basis for these assessment programs. The instruments include tests and questionnaires of selected learning areas/competencies that also need to be standardized and the item banks need to be developed systematically and scientifically. The questionnaires also need to focus on measuring other factors, such as students' beliefs, learning interests, and attitudes towards learning.

4. In addition to ensuring the reliability and validity of the assessment programs, issues related to accountability and fairness in standardized assessments should also be ensured.

With the above recommendations, it can be seen that psychometric theories in general and Rasch measurement in particular will be useful tools to successfully implement these assessment innovations.

4. Acknowledgement

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