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Pedagogical student assessment tools for learning outcome assessment skills

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Abstract

Assessment of learning outcomes has always been seen as an essential structure in the teaching process and one of the core competencies of educators. Our research aims at 2; one is to analyze the generated operating systems, a good skill in assessing learning outcomes; Second, a tool to assess pedagogical students' skills was developed to evaluate learning outcomes and test scores on students of some pedagogical universities in Vietnam. Using the Delphi method, the authors conducted three discussions to create a student assessment tool. After developing a tool to evaluate pedagogical students on assessment skills, the researh tested the tool scores on 608 students of pedagogical universities in Vietnam. The study results provide policymakers and administrators of pedagogical student training programs to evaluate and build capacity for pedagogical students. Each country has its training program for teachers. With the trend of internationalization, the practice of assessing learning has common outcomes. Therefore, this research article written for Vietnam can also be used in other countries.

Keywords: Assessment techniques, assessment tools, learning outcomes, pedagogical students, pedagogical competence

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1. Introduction

"Assessment is an essential aspect of effective education" because "students do not always learn what they are taught" (Paul Black & Dylan Williams, 2018). To accurately assess student learning outcomes, teachers must know how to apply the science of measurement and Assessment in Education and organize the Assessment accurately, effectively, and objectively (National Academies Press , 2003). Evaluation has many functions, including providing feedback to assess the quality and effectiveness of the teaching and learning process. This creates the basis for adjusting and improving teaching and learning activities. During the training process, Pedagogical students need to be trained in basic scientific knowledge, educational science knowledge, and, more importantly, in fostering specialized competencies and skills: specific professions and professions of the work. One of the important components of a teacher's skill system is the ability to assess students' learning outcomes.

Currently, many countries have many policies regulating the standards of teachers. For example, in Vietnam, there is a circular 20 (Vietnam Ministry of Education and Training, 2018) on professional standards for teachers of general education institutions, including 15 criteria, of which 1 Criterion requires teachers to have the ability to test and evaluate in the direction of developing students' quality and capacity. However, the assessment competency frameworks in teacher training and retraining programs lack clarity and completeness. Therefore, it is very necessary to develop a tool to evaluate pedagogical students on the skills of assessing learning outcomes. This helps students: first, they can note the level of assessment skill demonstrated by performance behavior during assessment of learning outcomes; second, observe if students majoring in pedagogy attain the professional standards for high school teachers. Both the university and the student can then develop a plan to adjust learning process and procedures.

This article suggests a skill structure to evaluate learners' results with full criteria and behavioral indicators. We will use the Dreyfus scale from this structure to build this skill assessment tool for pedagogical students. At the same time, we are using the Delphi method to complete the skill assessment tool for students and testing this tool on final-year students in pedagogical schools in Vietnam. While training programs may vary from country to country, we believe teachers' skills, especially assessment skills, are common. This tool, after being successfully built and tested, can be universally applied.

2. Literature view

2.1. Ability to assess student learning results

In 1934, Raphl Tyler (The State University, 2022) offers a view of assessing students based on educational goals. According to him, "assessment is essentially the process of determining the extent to which the objectives of the educational program are achieved." Researchers worldwide, including Herbert Walberg and Geneva D Haertel (Herbert J Walberg; Geneva D Haertel, 1990), Saskatchewan Ministry of Education (Saskatchewan Ministry of Education, 2010) on assessment skills and training assessment skills for pedagogical students, have discussed them from different angles. Research shows that equipping knowledge and assessment skills for pedagogical students and teachers is necessary and important.

Currently, the structure of assessment skills in Education has also been researched and proposed by many educators from different perspectives. McMillan summarizes the "big ideas" in assessment – including 11 basic assessment principles for teachers and school administrators (McMillan, 2000). While it does not include skills related to what teachers must and can do, the principles reflect a summary of teachers' background knowledge to perform well in assessments. To reflect assessment competence in a realistic way related to aspects of teachers' classroom assessment work, some authors have pointed out that assessment skills reflect current assessment needs. Teachers are consistent with the tendency to emphasize process assessment and standards-based assessments. This is shown in the list of Stiggins with 7 component assessment capabilities (Stiggins, 1999), Brookhart's list with 11 criteria of knowledge - assessment skills of teachers (Brookhart, 2011)… Alice A. Michell proposed an assessment of 13 component skills: Assessment Design; Articulating Learning and Development Outcomes; Selection of Data Collection and Management Methods; Assessment Instruments; Surveys Used for assessment Purposes; Interviews and Focus Groups used for Assessment Purposes; Assessment Methods: Analysis; Benchmarking; Program Review and Evaluation; Assessment Ethics; Effective Reporting and

Use of Results; Politics of Assessment; Assessment Education (Alice A. Michell , 2006). In addition, Abell and Siegel developed a model of assessment competence of science teachers with four components: assessment purpose, assessment content, assessment strategy, and results from interpretation - implementation (Abell S. K. & Siegel M., 2011). These four elements interact closely with each other and are governed by a central factor that is the teacher's view of learning and the core values and principles of learning and Assessment. Pastore and Andrade develop an assessment competency model around three aspects from the perspective of social construction: theory - concept, practical application, and social consciousness, integrated with the context of the classroom, school, educational system, and country contexts (Pastore S., & Andrade H. L., 2019). Jahan Ara Shams and Muhammad Zafar Iqbal proposed a program to develop assessment knowledge including seven contents: Choosing methods of Assessment; Development of methods of Assessment; Administration of a test, scoring of the test, and interpretation of the results; Making decision using assessments; Grading using assessments; Communication of assessment results; Recognizing unethical methods of Assessment (Jahan Ara Shams and Muhammad Zafar Iqbal, 2019).

Since the Ministry of Education and Training established the Examinations Department in Vietnam, the Assessment of students' learning outcomes has received more attention. Dang Ba Lam inherited the documents on the theory of higher Education and approached the latest documents on Assessment in Higher Education, thereby building an innovative testing and evaluation process. Teaching consists of 10 steps (Dang Ba Lam, 2003). Author Nguyen Cong Khanh has proposed the process, and techniques for designing, adapting, and standardizing measuring tools. In particular, the author provides practical skills in designing a measurement for assessing the situation, adapting skills, and standardizing a test (Nguyen Cong Khanh, 2004).

The above researchers have introduced many different groups of assessment skills, but in general, they are still associated with the characteristics and evaluation process. However, studies have not yet provided specific behaviors for each skill to facilitate assessing students' skills in terms of learning outcomes. Therefore, we generalize according to the assessment process and describe the manifestation behavior of skills in groups: a group of skills to prepare for assessment activities, a group of skills to design assessment tools, and a group of skills. Organizational ability to collect information, group of skills to analyze, process, and interpret data, group of skills to respond to results.

* *Group of skills to prepare for assessment activities:* The structure of the skills group to prepare for assessment activities is presented in Table 1:

Table 1. Structure of skills group in preparation for assessment activities

Skills	Component Behavior
Assessment planning skills	- Specify the objective of the assessment - Design evaluation procedures (content, audience, information to be collected and processed, time, number of times, and conditions for evaluation) - Identify learning opportunities for students
The skill to determine the behavioral index of the capacity to be assessed	- Write down the behavioral index (through the evolution of the skill performance) - Identify the most critical behavioral indicators
Skills in building rubric of competency evaluation criteria	- Select and use an existing scale or integrate many scales, or design a new scale suitable for the assessment objective - Design the criteria table to evaluate the capacity

* *Skill group for designing assessment tools:* The structure of this skill group is shown in Table 2

Table 2: Form of assessment tool design skill group

Skills	Component Behavior
Building evaluation content matrix	- Draw evaluation content matrix table - Assign proportions corresponding to the content and cognitive level of students
Building an assessment tool	- Selecting an evaluation tool - Build assessment tools
Test and refine the assessment tool	- Retest the value of the assessment tool - Revise the rating tool

** Group of skills to collect information:* The structure of skills to collect data is shown in Table 3:

Table 3. Form groups of skills to collect information

Skills	Component Behavior
Organizational skills to collect information	- Organizing and implementing activities to collect information (organization of written tests, homework, questions, and answers)

** Group of skills to analyze, process and interpret data*: The structure of the group of skills to analyze, process, and interpret data is shown in Table 4:

Table 4. Form of the group of skills to analyze, process, and interpret data

Skills	Component Behavior
Using information processing methods	- Using qualitative information assessment criteria table - Use mathematical formulas or quantitative processing software to evaluate quantitative information
Interpretation of the obtained data	- From the obtained data, give the student's assessment results - Identify the effects and causes of the results - Explain the development level of students

** Group of skills to respond to results:* The structure of this skill group is shown in Table 5:

Table 5. Group structure of feedback skills

Skills	Component Behavior
Communicate assessment results to relevant stakeholders	- Determine the purpose and time of reporting - Interpreting the content of the report - Presenting the reporting language
Using assessment results to adjust the teaching process	- Planning a teacher's pedagogical intervention - Instruct students on how to make plans to improve their performance - Make recommendations for parents

2.2. Dreyfus's skill rating scale

Currently, in the Assessment of learning outcomes, some models can be listed as follows: Bloom's thinking development scale (Patricia Armstrong, 2010), Dreyfus' five-stage model of skill formation (Ransom Patterson, 2017), structural model of learning outcomes of Biggs and Collis, aka SOLO (Biggs, J. B., & Collis, K.F. , 1982). Assessment of skill proficiency also has many scales such as Harrow (Bruce H. Choppin & T. Neville Postlethwaite, 1979), Dave, (Simon Paul Atkinson, 2018)... In these scales, Dreyfus' scale is commonly used for skill assessment. Dreyfus (1980) developed the Five-Stage Model of Adult Skill Acquisition. This process includes five levels of development from novice to expert: 1) Novice, 2) Advanced Beginner, 3) Competence, 4) Proficiency, and 5) Expertise. The Dreyfus scale has been used to assess vocational skills for many fields, but not much attention has been paid

to the pedagogical profession. In this study, we aim to use Dreyfus's scale to build a tool to assess students' skills in assessing learners' results.

The Five-Stage Model of Adult Skill Acquisition given by Dreyfus is specifically:

- Novice: Has an incomplete understanding, approaches tasks mechanistically, and needs supervision to complete them.

- Advanced Beginner: Has a working understanding of actions as a series of steps and can complete more straightforward tasks without supervision.

- Competent: Has a good working and background understanding, sees actions at least partly in context, and can complete work independently to an acceptable standard though it may lack refinement.

- Proficient: Has a deep understanding, sees actions holistically, and can achieve a high standard routinely.

- Expert: Has an authoritative or deep holistic understanding, deals with routine matters intuitively, can go beyond existing interpretations, and achieves excellence easily.

Based on the Dreyfus model of skill acquisition from the professional standards for conservation, the Institute of Conservation (London) 2003 analyzed each specific expression of these levels to define an acceptable level for the Assessment of competence or capability... The Dreyfus scale has been used to assess vocational skills for many fields, but not much attention has been paid to the pedagogical profession. In this study, we aim to use Dreyfus's scale to build a tool to assess students' skills in assessing learners' results.

3. Materials and method

3.1. Design a tool to assess students' skills

3.1.1. Design a tool to assess students' skills using the Delphi method

Questionnaire round 1:

The questionnaire consists of 5 discussion questions to explore issues related to students' learning performance assessment skills today. The researcher sent this questionnaire to 5 expert commenters to complete the first round of the questionnaire before being included in the expert group discussion.

Questionnaire round 2:

From the results of the discussion in round 1, synthesizing the opinions of experts, combined with the study of documents, the author outlines a system of behaviors of learning outcomes assessment skills and indicators to assess the skill level. Then develop a survey of experts' opinions in the second round of discussion. The questionnaire is designed in the form of an online survey that can be discussed online (Google form) consisting of 25 questions selected on a 5-point Likert scale ranging from Totally disagree (1); Disagree (2); Normal (3); Agree (4); Totally agree (5) with the indicators of the expression level of 25 specific behaviors and two questions asking for comments on additions, corrections, corrections,

Questionnaire round 3

The results of the 2nd round discussion are the input to the 3rd round discussion. In the 3rd round of discussion, the questionnaire is designed with 25 choice questions to agree (1) / disagree (2) with the system of behavior and skill level indicators. In addition, the questionnaire also has two questions to ask experts to continue contributing to the Evaluation Framework.

Invite experts to join the Delphi discussion: The researcher sent an invitation letter and received the consent of 25 experts to participate, specifically: 10 pedagogical lecturers, five high school teachers, five junior high school teachers, and 5 primary school teachers. The expert panel is encrypted to ensure anonymity. The members of the expert group know each other only through codes. The personal information of professionals is kept confidential. The researcher clearly states the above commitment in the invitation letter to all experts.

3.1.2. Research organization

Experts discuss online meeting rooms via google meet or how to answer questionnaires.

Round 1: An online discussion was conducted through the google meet online meeting room; due to the complicated development of the Covid-19 epidemic, the government required distance and recommended avoiding large gatherings. Five experts participated in the online discussion. The discussion took place within 3 hours; from discussing and answering the research questions, the expert panel reached a consensus on the assessment skills assessment sheet.

Round 2: The researcher sent the second round questionnaire in google form to 25 experts requesting to complete the answers within five working days. The researcher collected 25 answer sheets.

Round 3: The author receives comments in round 2, corrects, adjusts, and supplements the assessment form for assessing learning outcomes. After remedying the evaluation framework, the researcher sent the 3rd round questionnaire to 25 experts and obtained 25 responses. The third round of expert opinion survey results reached a consensus rate of 85%. With a high level of consensus, conducting another round of discussions is not necessary. Round 3 discussion completed Delphi study.

3.2. Test the tool to assess students' skills

We selected schools in different regions and locations for the experimental results to be objective and universal. Selected 608 final year students at the Pedagogical University; these are pedagogical students who have completed their pedagogical training programs and are participating in the pedagogical internship process. The research team sent criteria sheets to assess the skills of assessing learning outcomes to 608 students at these Pedagogical Universities. During the pedagogical practice, these students will assess student learning outcomes and use this form to self-assess their skills.

The researcher collects the rubrics and opens an online discussion conducted through the google meet online meeting room with the participation of students who have tested the rating cards. After the conference, the researcher summarizes the consensus on the skills assessment form and continues to edit it to further improve the skills assessment form.

3.3. Select a pedagogical university and participating lecturers and students using the criteria sheet

The research team selected three pedagogical universities in 3 regions of Vietnam: Hanoi Pedagogical University 2, Vinh University, and Pedagogical University- Danang University, with ten lecturers who are experts participating in discussions using the Delphi method. In addition, there are five primary school teachers, five middle school teachers, and five high school teachers. These professionals have knowledge and experience in teaching and also experience assessing student learning outcomes.

For students participating in the testing of the assessment tool, we selected 324 students from Hanoi Pedagogical University 2, 154 students from Vinh University, 130 students from the Pedagogical University- Danang University, and students of pedagogy majors. Those who have completed training programs on pedagogy are participating in the process of a pedagogical internship.

3.4. Stages of research

The study took place over 24 months, divided into the following 3 phases:

Phase 1 (May 2019 - October 2019): Research and analyze theory, determine research objectives and tasks, form a research framework, prepare materials, and select survey subjects.

Phase 2 (October 10, 2019 - December 12, 2020): The phase of designing survey tools and conducting a survey on the current situation of assessment skills of pedagogical students at 3 Hanoi Pedagogical Universities 2, Vinh University, Pedagogical University- Danang University.

Phase 3 (January 2021 – May 2021): The stage of processing the collected data and drawing conclusions

4. Results

4.1. Tools to assess pedagogical students on skills of assessing learning results

4.1.1. Round 1 survey results

The experts discussed and agreed on the following common statements:

- Pedagogical students all have specific knowledge and skills in assessing learning outcomes for students. Student achievement is due to the experience of their assessment process and the training process from the school.

- In the process of assessing student learning outcomes, students must go through the following stages: (1) Preparing for assessment activities, (2) Designing assessment tools, (3) Organizing information collection information, (4) Analyzing, process, and interpreting data, (5) Respond to results. In terms of the process approach, each stage will have a group of skills that students need to practice.

- Each group of students' skills in assessing learning outcomes is demonstrated through specific behaviors performed during the assessment process.

4.1.2. Round 2 survey results

The input to the second survey round is the result of the first round discussion. Based on exploiting the criteria for assessing students' learning skills, the research team synthesizes an assessment framework including 24 criteria. Experts review and comment on those criteria in this second round of the survey. Results 100% of the questions received answers from level 3 (Comment) to level 5 (Strongly agree). That is, experts see a certain degree of relevance in these contents. However, the experts gave specific comments to discuss the correction as follows:

- There are three opinions that in the assessment preparation stage, it is necessary to pay attention to preparing "content, information about the object of assessment, information to be collected."

- There are three opinions that in building an evaluation rubric, it is possible to "select and use an existing scale or integrate multiple measures" along with the content "designing a new scale suitable for the evaluation objective."

- There are two ideas to add the criteria "determining learning opportunities for students" in the assessment planning skills section and let the maximum score for this criterion be 1 point.

- There are five opinions on regulating the maximum score in the question-building skill group: the criterion "Selection of assessment tools" is 5 points and the criterion "Building assessment tools" is 15 points.

- Some detect errors in presentation, and expression, use words to describe the behavior of skills, and suggest a text correction.

4.1.3. Round 3 survey results

Based on the discussion in round 2, the research team corrected, adjusted, and supplemented the content to clarify the tasks and reset the scores in the criteria to clarify the focus of the student's assessment skills. Through answering the questionnaire with a consensus rate in the third round of 85% or more, 25 experts and research groups have agreed to define a tool to evaluate pedagogical students on skills to assess learning outcomes. Summary of evaluation criteria sheets including 11 component skills corresponding to 25 criteria and the maximum score of each criterion.

Table 6: Criteria sheet for assessing skills to assess learning outcomes

Symbol	Criteria	Maximum Score	Consensus Rate (%)
	1. Assessment planning skills		
CBDG 1	Specify the objective of the assessment	2	88,00
CBDG 2	Design audit procedures (content, audience, information to be collected, and processed, time, number of times and conditions for evaluation)	2	88,00
CBDG 3	Identify learning opportunities for students	1	92,00
	2. The ability to determine the behavioral index of the competency to be assessed		
CBDG 4	Write down the behavioral indicator to be assessed (through the evolution of skill performance)	3	88,00
CBDG 5	Identify the most important behavioral indicators	2	96,00
	3. Rubric construction skills assessed		
CBDG 6	Select and use an existing scale or integrate many scales, or design a new scale that is suitable for the assessment objective.	5	96,00
CBDG 7	Design the evaluation criteria table	5	92,00
	4. Skills in building assessment content matrix		
CCDG 1	Draw the assessment content matrix	10	100,00
CCDG 2	Assign proportions corresponding to the content and cognitive level of students	10	100,00
	5. Skills in building assessment tools		
CCDG 3	Selection of assessment tools	5	92,00
CCDG 4	Build assessment tools	15	100,00
	6. Skills for testing and perfecting assessment tools		
CCDG 5	Check the value of the assessment tool	10	88,00

CCDG 6	Edit rating tool	10	88,00
	7. Information gathering skills		
TTTT 1	Organize activities to collect information (organization of written tests, homework, quizzes)	10	100,00
	8. Ability to use information processing methods		
PTDL 1	Using criteria table to assess qualitative information	2	92,00
PTDL 2	Use mathematical formulas or quantitative processing software to evaluate quantitative information	3	88,00
	9. Ability to interpret obtained data		
PTDL3	From the obtained data, give the student's assessment results	4	96,00
PTDL 4	Identify the effects and cause the results	3	92,00
PTDL 5	Explain the student's level of development	3	92,00
	10. Skills in conveying assessment results to relevant audiences		
PHKQ 1	Determine the purpose and timing of the report	1	88,00
PHKQ 2	Interpretation of the content of the report	2	88,00
PHKQ 3	Report language presentation	2	92,00
	11. The ability to use assessment results to adjust the teaching process		
PHKQ 4	Planning the teacher's pedagogical intervention	4	92,00
PHKQ 5	Teach students how to make a plan to improve their achievement	3	100,00
PHKQ 6	Make recommendations for parents	3	88,00

The research based the Dreyfus scale on building the scoring instructions in this study. For students, we do not anticipate the level of experts. We expect the highest level of student achievement to be level 4 – Proficient. The skills scores are calculated by the average score of the behavioral indicators (depending on the weight).

Table 7. The scale of development of component skills in scoring instructions

No.	Score	Indicator	Level
1	Novice	Have not performed the operations or performed the operations incorrectly	0 % - 25 % score
2	Advanced Beginner	Follow the detailed instructions of the teacher	26% - 50 % score
3	Competent	Perform more proficient and accurate operations without detailed instructions. But there are a few small errors.	51% - 75 % score
4	Proficient	Coordinate and harmonize operations in different circumstances 7	76% - 100 % score

The overall results of skills for assessing student learning outcomes are calculated by the average score of the component skills (weighted dependent). They can be concluded based on the following score ranges:

+ From 0-25 points, the student's skill is at level 1 (Novice).

+ From 26 to 50 points, the student's skill is at level 2 (Advanced Beginner).

+ From 51 to 75 points, the student's skill is at level 3 (Competent).

+ From 76 to 100 points, that skill of the student is at level 4 (Proficient)

4.2. Test results of assessment tools on students' skills in assessing learning results

Statistical results of the aggregated scores of the skills test components of the Assessment are shown in Table 8 and Figure 1.

Table 8. Summary table of test results of component skills of the Assessment

No.	Skill Component	Level 1	Ratio	Level 2	Ratio	Level 3	Ratio	Level 4	Ratio
1	Assessment planning skills	240	*39,5*	328	*54,0*	40	*6,5*	0	*0,0*
2	The ability to determine the behavioral index of the competency to be assessed	532	*87,5*	73	*12,0*	3	*0,5*	0	*0,0*
3	Rubric construction skills assessed	298	*49,0*	193	*31,7*	96	*15,8*	21	*3,5*
4	Skills in building assessment content matrix	239	*39,3*	153	*25,2*	98	*16,1*	118	*19,4*
5	Skills in building assessment tools	102	*16,8*	236	*38,8*	187	*30,7*	83	*13,7*
6	Skills for testing and perfecting assessment tools	501	*82,4*	107	*17,6*	0	*0,0*	0	*0,0*
7	Information gathering skills	405	*66,6*	203	*33,4*	0	*0,0*	0	*0,0*
8	Ability to use information processing methods	523	*86,0*	85	*14,0*	0	*0,0*	0	*0,0*
9	Ability to interpret obtained data	415	*68,3*	96	*15,8*	97	*15,9*	0	*0,0*
10	Ability to communicate assessment results	514	*84,5*	86	*14,1*	8	*1,4*	0	*0,0*
11	The ability to use assessment results to adjust the teaching process	342	*56,3*	151	*24,8*	84	*13,8*	31	*5,1*

The results in Table 8 and Figure 1 show:

Besides the very high percentage of students who do not have assessment planning skills (39,5%), there are still students who have this skill at a new level (54,0%) or skilled (6,5%) (levels 2 and 3). This is explained by the fact that these students have accumulated this knowledge and skills through the Teaching Methodology, Education, and Psychology modules.

For the skill to determine the behavioral index of competency to be assessed: Most students do not have this skill (87,5%), and very few students are at level 2 (12,0%). This may be because students do not know that this operation must be performed during the assessment process or do not understand the meaning of this operation. For rubric construction skills assessment: Most students do not know this skill; however, there are still a significant number of students who have the skill (15,8%)

and master this skill. For rubric construction skills: Most students do not know this skill; however, there are still a significant number of students who have the skill (15,8%) and master this skill (3,5%). The reason is that a large percentage (37,05%) of students already know the evaluation criteria sheet, so many students have been trained in this skill.

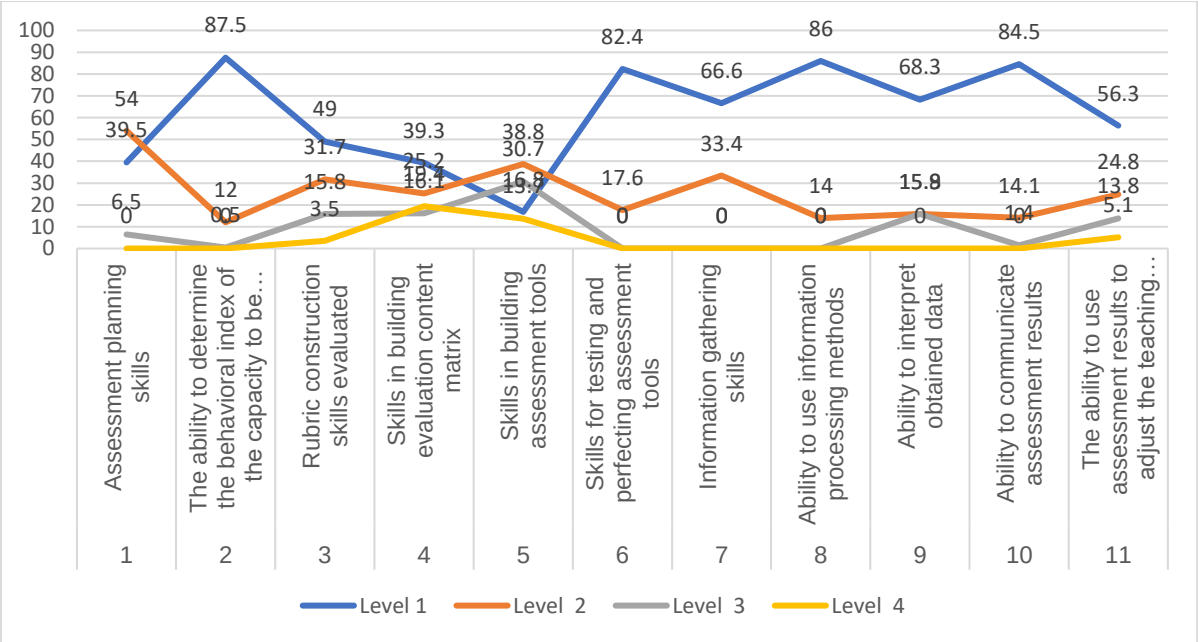

Figure 1. Graph of test results for components of the Assessment

The skills of building an assessment content matrix and an assessment tool have similar rates of achievement levels for students. And in both of these skills, many students have achieved levels 3 and 4. One of the reasons may be because students have experience of testing and evaluation by teachers with these skills, or In the process of studying other modules, students have practiced these skills.

Skills in testing and perfecting assessment tools, skills in using information processing methods, and skills in transmitting information about assessment results: For these skills, the number of unknown students is over 80,0 %, and none of the students achieved levels 3 and 4. The skills of organizing information gathering were the same, only the students achieved the level of 1 or 2, and none achieved the level of 3 or 4. This proves that, in practicing assessment skills, students have always made judgments about the accuracy, difficulty of test questions, and how to organize information collection activities. At the same time, students only respond with scores to learners but have never commented on the results achieved by students.

To interpret the data obtained from the assessment results, then use this to adjust the teaching process. Some students already know how to do it (Level 2) and have the skills (Level 3) with this operation. However, the number is not much (level 3 is 15,9% and 13,8%, respectively). Therefore, there must still be a plan to continue training.

Identifying the results of each component skill of the students helps the lecturers come up with solutions in the training process to develop the student's assessment skills. However, to increase the accuracy, the research team uses synthetic scoring to determine the combination of component skills in the assessment process, thereby assessing the overall assessment skills of students. We

require each student to complete the test assessment steps for competency for specific content. Students' work is graded according to the scorecard in Table 6; then, we use the Frequency function to statistics the frequency of students scoring x_i. The results are shown in Tables 9 and 10:

Table 9: Summary of the number of test scores of students

University	Total	number of articles with score x_i									
		1	2	3	4	5	6	7	8	9	10
Hanoi Pedagogical University 2	324	0	29	18	37	93	78	39	18	12	0
Vinh University	154	0	9	5	24	44	41	23	5	3	0
University of Danang	130	0	2	1	19	47	41	18	1	1	0

Table 10: Summary of the percentage of students' test scores

University	Total	Number of articles with score x_i									
		1	2	3	4	5	6	7	8	9	10
Hanoi Pedagogical University 2	324	0,00 %	8,95 %	5,56 %	11,42 %	28,70 %	24,07 %	12,04 %	5,56 %	3,70 %	0,00 %
Vinh University	154	0,00 %	5,84 %	3,25 %	15,58 %	28,57 %	26,62 %	14,94 %	3,25 %	1,95 %	0,00 %
University of Danang	130	0,00 %	1,54 %	0,77 %	14,62 %	36,15 %	31,54 %	13,85 %	0,77 %	0,77 %	0,00 %

The results in the table above are shown in Figure 2:

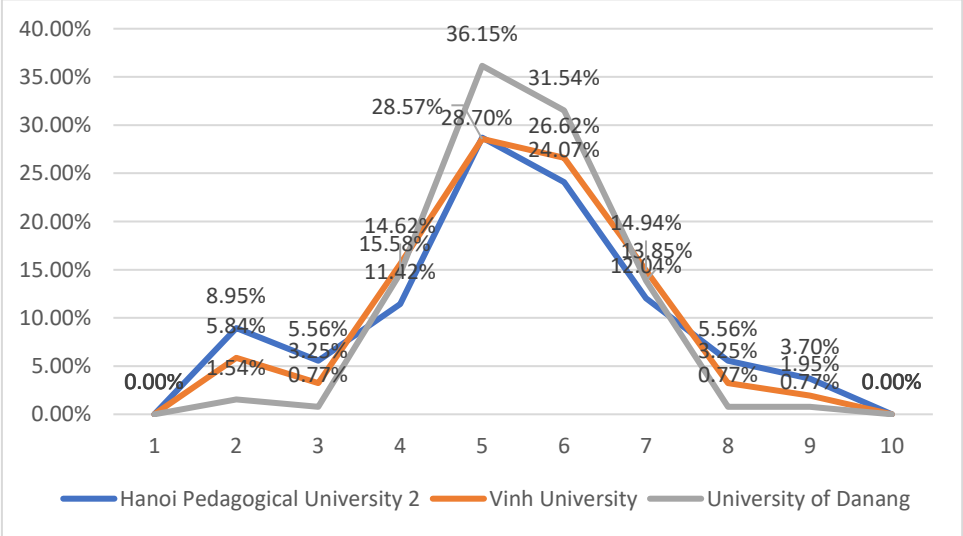

Figure 2. Frequency distribution chart of test scores on assessment skills

Tables 9 and 10 and Figure 2 show that the final year students of bachelor's degrees in the pedagogy of all three universities already have skills in assessment. However, these skills almost only stop at levels two and level 3, in which they mainly stop at points 5 and 6. So that these students can ensure that they meet the professional standards of teachers after graduation. Schools and pedagogical universities need to take measures to continue developing students' skills.

Use Descriptive Statistics to calculate statistical parameters such as mean, mode, median, and standard deviation. The results are shown in Table 11:

Table 11: Statistical parameters of test scores

University	Average	Median	Mode	Standard	Deviation Range
Hanoi Pedagogica University 2	5,30	5	5	0,094	7
Vinh University	5,34	5	5	0,119	7
Pedagogica University - Danang University	5,47	5	5	0,093	7

The results in Table 11 show that the average scores of the three pedagogical universities, Hanoi Pedagogical University 2, Vinh University, and Pedagogical University - Danang University are similar. The standard deviation and the variation range across tests are within the reliable range. We use the T-test: Two-Sample Assuming Equal Variances to test whether this difference is significant. The results are presented in Table 12:

Table 12. Results of testing the difference in mean scores between universities

Compare	Average difference	|t| (t Stat)	df	p(T<=t) two-tail	t Critical two tail
Hanoi Pedagogica University 2 - Vinh University	0,04	0,33	474	0,737	1,97
Hanoi Pedagogical University - Danang University	0,17	0,95	450	0,34	1,97
Vinh University - Danang University	0,13	0,64	280	0,51	1,97

The results shown in Table 12 show that the t-Stat values are all smaller than the t Critical two-tail; values of p are all greater than the alpha value (0,05). Therefore, the difference between the mean scores of 3 pedagogical universities, Hanoi Pedagogical University 2, Vinh University, and Pedagogical University - Danang University, is insignificant. This confirms that the assessment skills of students of 3 schools are equivalent. So, based on the survey results, it was found that the final year students with a bachelor's degree in pedagogy mostly had assessment skills in teaching at level 3. However, they were not at the high score threshold. Therefore, to become a teacher in the future, it is necessary to continue training to improve assessment skills for final-year students majoring in Pedagogy.

At the end of testing the tool for pedagogical students on assessing learning performance assessment skills, we had an online discussion with students and revised the assessment tool. Most of

the editing comments are related to errors in presentation and expression to make it easier to understand.

5. Discussion

Evaluating student learning outcomes has now received the attention of many teachers and lecturers at pedagogical universities. Therefore, the training of pedagogical students in assessing learning outcomes is an urgent issue. Identifying the component skills and the manifestation of those skills helps teachers in pedagogical schools train students from the point of view of constructivist theory. This is especially important in teaching students pedagogical skills. Building a tool for students to self-assess their skills will also be a learning aid.

The assessment skills training for pedagogical students is often through the integration into the lessons of education. Therefore, when building a skill assessment tool to assess learning outcomes and experimenting on students, most expressions of students' assessment ability are still low. After correcting errors in presentation and saying, this tool can be widely used in training the skills of assessing learning outcomes for pedagogical students. However, during the implementation of the tests, as well as the survey, the following challenges are the factors affecting the results of the assessment skills of pedagogical students in Vietnam:

- Students are still vague about the assessment process, especially specific actions/behaviors in assessment skills. This may be because students have not studied a particular course related to the assessment of learning outcomes. Students only know briefly about assessment through courses on pedagogy or teaching methods

- Students who have experience are the object of the assessment process. However, the evaluation process of lecturers or high school teachers also does not entirely fulfill the requirements of the assessment (which may be omitted in many parts). Therefore, when pedagogical students were brought in to act as teachers, they also imitated the models they were taught

To address the above challenges, we believe it is necessary to:

- Include the content on "forming skills to evaluate learning outcomes" into the module "Measurement and assessment in education" in the bachelor's pedagogical training program. Or properly integrate the content of training assessment skills into other modules, mainly modules in the content block of pedagogical training. Specifically, the contents include:

+ General perception of assessment in teaching: Basic knowledge includes: The concept of assessment of learning outcomes; Roles and functions of assessment; Types of assessment; Requirements, assessment principles; assessment process; Modern perspectives on assessment of learning outcomes.

+ Ability to prepare for assessment activities:

About knowledge: Assessment content (learning objectives); Methods of assessing learning results; Learning assessment tools; The relationship between the content, methods, and assessment tools; Concept, structure, and meaning of assessment plan.

About skills: Identify assessment content (subject learning objectives); select assessment methods and tools; Present the evaluation plan.

+ Ability to design tools to evaluate learning outcomes:

About knowledge: Structure, function, and typical tools belong to 2 groups of assessment tools: Testing tools (assessment tasks) and Measuring tools (assessment manuals); Validity and reliability of the assessment tool

About skills: How to build 2 groups of assessment tools: Testing tools (assessment tasks) and measuring tools (assessment manuals)

+ Ability to organize Assessment of learning results:

About knowledge: Qualitative assessment, quantitative assessment; Group/criteria/individual reference assessment; Self-assessment, peer assessment

About skills: How to organize assessments, including Notify students about assessment activities; Deploy evaluation information collection; Analyzing and synthesizing evaluation information

+ Ability to analyze, process, and interpret data

About knowledge: Concept, the meaning of qualitative and quantitative information processing methods, of the interpretation of data obtained

Skills: How to process qualitative and quantitative information and interpret the obtained data?

+ Ability to respond to results:

About knowledge: Concept, the meaning of feedback, effective feedback model; Regulations on confirming student academic results

About skills: How to build feedback, develop measures to adjust teaching and learning activities

- Strengthening students' practice assessing learning outcomes during pedagogical internships at high schools.

- It is necessary to train teachers on the content of assessments to change the way of assessments for students

6. Conclusion

The teaching process is successful with practical assessment. Although assessment is the final step of the teaching process (Helen Jordan, 2015), it plays a role in content orientation and teaching methods. The current educational goal of Vietnam is shifting toward developing learners' capacity, which also entails innovation in assessment. Therefore, developing assessment skills for pedagogical students is essential so that they can meet the changing educational goals and social needs of Vietnam. The toolkit for assessing pedagogical students on the skills of assessing learning outcomes, including 25 criteria and the corresponding score level, will be both a tool for teachers to evaluate students and for students to self-assess. Assessment, through which self-study and self-training improve self-efficacy.

The reality shows that the assessment skills of 4th-year pedagogical students are mainly built at the level of knowing or knowing but not yet mastering. Therefore, pedagogical universities in Vietnam should devote a certain amount of time to providing students with this knowledge and skill training. At the same time, actively create opportunities for students to practice and practice this skill. In addition, through the survey, we have also confirmed that pedagogical students are weakest in skills such as skills to determine behavioral indicators of competencies to be assessed, skills to test and

complete tests, skills to organize information collection, skills to use information processing methods, skills to transmit information about evaluation results. Next are skills such as the ability to interpret the obtained data and the skill to use the assessment results to adjust the teaching process; these are also weak skills of pedagogical students. Based on these results, pedagogical universities can develop content and forms to develop student assessment skills.

Our main aim in this study is to provide an appropriate tool to assess the performance assessment skills of pedagogical students. This tool is both a rubric for students to use in the self-study process and, at the same time, a tool for teachers to measure students' achievement in assessment skills (a very important skill). importance of a high school teacher) to take measures to continue training for his students.

The Delphi method has exploited the practical experience and in-depth understanding of experts in the field of assessment of learning outcomes, thereby concretizing it into a system of criteria and indicators. This system is the basis for assessing skills to evaluate learning outcomes. This study only tested 608 students, so it is necessary to continue to expand it to determine the accuracy of the levels of the proposed assessment criteria. At the same time, it is necessary to continue to determine the weights of the behaviors in the overall assessment of students' skills.

References

Abell S. K. & Siegel M. A. (2011). Assessment literacy: What science teachers need to know and be able to do. In The professional knowledge base of science teaching, Springer, Dordrecht, pp. 205-221. https://doi.org/10.1007/978-90-481-3927-9_12

Alice A. Michell. (2006). *Assessment skills and knowledge content standards were developed by the ACPA commision for assessment for student development directoratein consultation with diverse constituencils.* American College Personel Associatoin National center for higher Education, Washington, USA. https://www.northwestern.edu/studentaffairs/assessment/images/acap-ask-brochure1.pdf

Biggs, J. B., & Collis, K.F. (1982). Evaluating the quality of learning. The SOLO taxonomy *(Structure of the Observed Learning Outcome*). New York: Academic Press. https://www.elsevier.com/books/evaluating-the-quality-of-learning/biggs/978-0-12-097552-5

Brookhart S. M. (2011). Educational assessment knowledge and skills for teachers, Educational Measurement: issues and practice, 30(1), pp.3-12. https://doi.org/10.1111/j.1745-3992.2010.00195.x

Bruce H. Choppin & T. Neville Postlethwaite. (1979). *Evalution in Education*, Volume 1. https://www.elsevier.com/books/evaluation-in-education/choppin/978-0-08-023352-9

Dang Ba Lam. (2003). *Kiem tra – danh gia trong day – hoc dai hoc* [Assessment in higher education], Education Publishing House. Hanoi.

Herbert J Walberg và Geneva D Haertel. (1990). *The international encyclopedia of educational evaluation.* Pegamon Press. https://unesdoc.unesco.org/ark:/48223/pf0000170217

Jahan Ara Shams and Muhammad Zafar Iqbal. (2019). *Development of Classroom Assessment Literacy Training Program for University Teachers in Punjab.* Bulletin of Education and Research August 2019, no. 2 (41): 41-52. https://files.eric.ed.gov/fulltext/EJ1229452.pdf

McMillan J. H. (2000), Fundamental assessment principles for teachers and school administrators, Practical Assessment, Research and Evaluation, 7(1), pp. 8. https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1091&context=pare

National Academies Press. (2003). "Evaluating, and Improving Undergraduate Teaching in Science, Technology, Engineering, and Mathematics".Wasington. 71-99. https://doi.org/10.17226/10024

Nguyen Cong Khanh. (2004). *Danh gia va do luong trong khoa hoc xa hoi* [Asessment and measurement in social sciences]. National Political Publishing House. Hanoi.

Patricia Armstrong. (2010) *Bloom's Taxonomy.* Center for Teaching- Vanderbilt University. https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/

Pastore S., & Andrade H. L. (2019), Teacher assessment literacy: A threedimensional model, Teaching and Teacher Education, 84, pp.128-138. https://doi.org/10.1016/j.tate.2019.05.003

Paul Black & Dylan Williams. (2018). "Classroom assessment and pedagogy", *Assessment in Education: Principles, Policy &Pratice,* https://doi.org/10.1080/0969594X.2018.1441807

Ransom Patterson. (2017). *Use the Dreyfus Model to Learn New Skills.* College Info Geek. https://collegeinfogeek.com/dreyfus-model/

Saskatchewan Ministry of Education. (2010). *Cross-curricular Competencies.* Canana. https://publications.saskatchewan.ca/api/v1/products/64813/formats/72117/download

Simon Paul Atkinson. (2018). *Using Dave's Psychomotor Domain Taxonomy across all tertiary level programmes.* Sijen International Higher Education. https://sijen.com/2018/10/27/using-daves-psychomotor-domain-taxonomy-across-all-tertiary-level-programmes/

Stiggins R. J. (1999), Evaluating classroom assessment training in teacher education programs, Educational measurement: Issues and practice, 18(1), pp. 23-27. https://doi.org/10.1111/j.1745-3992.1999.tb00004.x

The State University. (2022). *Ralph W. Tyler (1902–1994)- Contribution to Testing and Curriculum Development, Advisory Role.* The StateUniversity.com Education Encyclopedia. https://education.stateuniversity.com/pages/2517/Tyler-Ralph-W-1902-1994.html

Vietnam Ministry of Education and Training. (2018). Circular 20/2018/TT-BGDDT professional standards for teachers of general education institutions (2018). https://luatvietnam.vn/giao-duc/thong-tu-20-2018-tt-bgddt-chuan-nghe-nghiep-giao-vien-co-so-giao-duc-pho-thong-166608-d1.html