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Modern Requirements For Developing Chemistry Tests And The Testological Approach

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Abstract: This article provides detailed information about the functions of tests, their classification, the purpose of administering tests, and the important aspects that must be considered when constructing tests.

Keywords: Test, test reliability, validity, objectivity, classification of tests, pedagogical test.

INTRODUCTION:

A test is a standardized, short, time-limited assessment aimed at determining individual quantitative and qualitative differences [1].

A pedagogical test is a set of test tasks that provides the opportunity to objectively determine the level of preparedness of examinees in specific areas of knowledge based on performance results [2].

CLASSIFICATION OF TESTS

1) According to the method of construction:

- Standardized tests: pedagogical tests that contain specific descriptions and characteristics, repeatedly used, and confirmed as stable through representative sampling.

- Non-standardized tests.

2) According to the means of presentation:

- Paper-based tests.

- Subject-based tests (related to a specific academic discipline).

- Instrument-based tests (using technical devices to study attention, perception, memory, etc.).

- Practical tests.

- Computer-based tests: administered on computers through software that ensures proper presentation and processing of test tasks.

3) According to purpose:

- Intelligence tests: psychological diagnostic tests intended to measure verbal, numerical, and graphical processing abilities.

- Personality-oriented tests: designed to evaluate creativity, originality, non-standard thinking, and problem-solving abilities.

- Achievement tests: assess how well a learner has mastered specific knowledge or skills.

4) According to the nature of behavior/activity:

- Verbal tests (involving mental activity).

- Non-verbal tests (requiring practical manipulation of objects).

5) According to the main objective:

- Speed tests (consisting of simple tasks).

- Power tests (consisting of more difficult tasks).

- Mixed tests (tasks of varying difficulty).

6) According to homogeneity:

- Homogeneous tests: assess preparedness in a single subject.

- Heterogeneous tests: assess preparedness in several related subjects.

7) According to objectivity:

- Objective tests: evaluation does not depend on the subjective interpretation of the test-taker.

- Projective tests: used in psychology within the framework of projective diagnostic methods.

8) Specialized tests:

- Broad-range tests: measure the effectiveness of the educational process and the system of knowledge, skills, and competencies learned by students.

- Narrow-range tests: measure learners' achievements in specific subjects or topics.

9) Tests aimed at specific use in education:

- Entry diagnostic tests: determine initial knowledge and skill levels.

- Progress tests: determine development achieved during learning.

- Diagnostic tests: identify difficulties within the learning process.

- Summative tests: tests of high complexity [3].

EXAMPLES OF TEST ITEMS

Example 1: True/False item

"Under identical conditions, equal volumes of gases contain equal numbers of molecules." (Avogadro's Law)

A. True

B. False

Correct answer: A

Example 2: Multiple-choice item

"A type of atoms with identical nuclear charge."

A. Atom

B. Molecule

C. Nuclear charge

D. Chemical element

Correct answer: D

Example 3: Best-answer item

"Atom — ?"

A. A positively charged nucleus and negatively charged electrons.

B. An indivisible particle.

C. Electrically neutral particle.

D. An electrically neutral, indivisible particle consisting of a positively charged nucleus and negatively charged electrons.

Correct answer: D

Example 4: Completion item

"_____ the volumes of gases entering into chemical reactions and the gases formed are in a ratio of _____."

A. Law of equivalents; large whole numbers

B. Law of equivalents; small whole numbers

C. Law of combining volumes; small whole numbers

D. Law of multiple proportions; large whole numbers

Correct answer: C [4]

MAIN QUALITY CRITERIA FOR TEST ADMINISTRATION

There are three interrelated quality criteria: reliability, validity, and objectivity.

Test reliability:

Reflects the accuracy of diagnostic measurements and the stability of results against random external factors.

Test validity:

Determines what the test measures and how well it measures it. Validity expresses the degree to which a test aligns with its intended purpose. The most important type is content validity, which determines whether the test adequately covers representative knowledge and skills and whether external influences affect performance [4].

Test objectivity:

Indicates that obtaining and interpreting diagnostic information does not depend on the teacher. Objectivity integrates reliability, validity, and ethical–pedagogical principles [5–8].

RULES FOR CONSTRUCTING TEST ITEMS

1. Formulate the question beginning from the correct answer.

2. The content must align with educational requirements and reflect the learning material.

3. Each question should express one complete idea.

4. Use words such as "sometimes," "often," "always," "never," "all" carefully.

5. Avoid vague words such as "big," "small," "many," "few," "less," etc.

6. Avoid irrelevant words unrelated to the main idea.

7. Distractors (incorrect answers) must be logically selected and not obviously incorrect.

8. Avoid trick questions.

9. All answer options must be grammatically consistent with the question stem.

10. Avoid negatives; especially avoid double negatives.

11. Answers should not depend on previous questions.

12. Correct and incorrect options must be similar in structure, content, and length [6].

REFERENCES

1. M.Sh. Zakirova, N.N. Ermatova. Methods for Constructing and Expert Evaluation of Tests. Tashkent, 2018. p. 41.
2. Ishmatov Q. Pedagogical Technology. Namangan State Pedagogical Institute, 2004.
3. Logvina E.V. Methodological Recommendations

for Developing Tests. Astana, 2014.

4. Zvonnikov V.I., Chelyshkova M.B. Modern Means of Evaluating Learning Outcomes. Moscow: Academy, 2007.
5. Testology Russian–Uzbek and Uzbek–Russian Explanatory Dictionary. Ed. B.M. Ismailov. Tashkent: State Testing Center, 2005.
6. Azamat ogli A.A., A'zamovna H.D. The impact of interactive teaching methods on chemistry learning efficiency. Online Scientific Journal "Education and Development Analysis," 2022.
7. Ganiev B.Sh. et al. The role of game technologies in increasing students' interest in chemistry. International Conference, Fergana, 2020.
8. Ganiyev B.S., Kholikova G.K., Salimov F.G. Educational developments in Uzbekistan: forming a perfect generation. 2019.