

# Managing the Process of Changing the Evaluating System of Nurses in Israel

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Evaluation of learners' achievements is part of the training process in nursing school. There are many ways to evaluate learners' achievements, but the most common way is a test. There are different types of tests. This paper aims to describe the development of a school system dealing with building tests and controlling the process of producing test in the academic nursing training center in central Israel. By the end of the process, a model was built and a work instruction was developed to guide uniform work methods among the organization staff members.

*Keywords:* lecturer, test' questions, item analysis, grads, nurse educators, test creating process

## Background

There are several study courses in the academic nursing training center:

Academic training of four years, 2.5 years retraining courses and 10-12 months advanced courses (advanced training) in specific domains for nurses as: intensive care, operation rooms, infections prevention. Most of the tests in these courses take place in nursing school.

Evaluation of learners' achievements is part of the training process in nursing school. There are many ways to evaluate learners' achievements but the most common way is a test. There are different types of tests. Tests have many advantages. The test results enable to identify the weak and strong learners and the missing disciplines in a specific group of learners. The teaching and learning processes can be deduced from the test results. All tests in the nursing school are of a multiple-choice type (including a stem and four distracters, one of which is correct). This kind of test includes the question called stem, and the part that contains the answer (Birenboim, 1997). There is an increase in the required amount of tests to be produced for students in the nursing school and therefore there is a need to establish a system that regulates the test producing procedure. The tests are prepared by a team of teacher nurses and lecturers who participate in teaching these courses.

Organizational change works from external and internal reasons. Therefore, it is requirement to uniform work. Internal organizational changes arise from the desire to successfully perform personal tasks and lead the organization to success (Levy, 2008; Work Plan, 2018).

The reasons influencing the need in establishing a school test system:

Increase in the amount of test producing:

1. The nursing administration in the Ministry of Health defined a national target to increase the number of nurses in Israel that claims:

a. To increase the amount of learners in all study courses.

b. To increase the number of study courses opening each year (working plan, nursing administration, 2018).

2. According to the academic study regulations, each test has two sessions (A and B). In some cases, students get approval to have a special exam session. A fact that creates a need to compose additional tests.

The test quality:

The lecturers are expert professionals in their fields: nurses, doctors, dietitians, physiotherapists, pharmacologists. They have to be taught how to write questions in a correct and structured way. They have to know the principals and instructions of composing a qualitative test. Therefore we have to:

1. Prevent a situation in which the learners appeal the test questions that find to be correct in a second check and cause the lecturer to cancel questions in the test or accept more than one correct answer.

2. Prevent a situation in which the examinees report during the test that: The question is not clear, the distracters are not clear, there is more than one correct answer or distracters of the answers is correct.

3. Prepare the learners to answer the test simulates the external qualification test during their studies.

4. Manage a computerized tests database that will provide a professional solution to composing a qualitative test.

To start this process, there is a need in a structured process which recruits the whole teaching staff to the organizational change.

### **Tests and Organizational Change**

The process was performed in several stages in order to lead the whole staff and to achieve organizational uniform performance.

The test items writing training was performed in big classrooms allowing a large group of people to be taught at the same time. The lecture method was used and computerized examples and exercises was integrated. Then, the training program was evaluated. The evaluation goal was to examine the knowledge assimilation and the implementation method.

#### **Stage 1—Knowledge Impart**

In leading organizational change, it is necessary to recruit the employees and provide them with the knowledge and skills in order to promote the organization's goals for its clients, who in this case are the learners. Providing knowledge is the first stage in leading the change (Meshulam & Harpaz, 2015).

A team of nurse educators in the organization was trained in Tel Aviv University in the Faculty of Nursing under the supervision of Dr. Koren, who was the head of the licensing and certification exams department in the nursing administration. In this meeting the public had a presentation and explanation of the principles of writing multiple choice items, goals, structure, criteria for a good test and other relevant information. They had an explanation about the item analysis results, about the significance of  $\alpha$  Cronbach, the meaning of a positive and negative correlation to each question, and more. At the end of the meeting, they practiced composition of questions that are considered "good" and diagnosis of questions considered "not good" and had an explanation.

About two months after this meeting, there was a workshop dealing with building items for the government licensing test of the Licensing Examination Division in the nursing administration. This workshop was also attended by the training center staff members in order to strengthen the knowledge and understanding

about writing test items and in order to lead and mediate the change and innovations in the nursing school. In this workshop, the Licensing Examinations Department' roles and the examination producing process were presented. They had an explanation on the test structure, the question structure, and formulation of question and distracters.

The importance for nurse educators to know and understand the principals of writing multiple choice items is:

- a. To know the guiding principles in creating external certification test;
- b. To follow those principals and use it in the daily work in school internal tests;
- c. That the learners in the training process will be exposed to questions/tests similar to the licensing test.

### Stage 2—Implementation

A system that responsible to test management was established in school. Its goal is to ensure that the composing tests process is uniform according to the required principles. This system was presented to the staff in a staff meeting.

The implementation was performed in two levels: A. the lecturer; B. the test.

A. Performance in lecturer's level:

The lecturer work by himself with the study material he teaches. Each lecturer/nurse educator corrects or creates new questions according to the stages: planning, writing, validation, proofreading.

1. Planning. Answering the question: "what do I actually want to test in each subject?". The area may be: prevention, estimation, diagnosis, treatment/intervention, patient's guiding. Each course is divided to subjects in accordance with the study syllabus. To each subject, a question is being written by the chosen area and we build a test map. Two examples are presented in Tables 1 and 2:

Table 1

#### *Heart diseases*

Subject/Area	Prevention	Intervention	Guiding estimation and diagnosis
M.I			
C.H.F			

Table 2

#### *Respiratory diseases*

Subject/Area	Prevention	Intervention	Guiding estimation and diagnosis
Pulmonary Embody			
COPD			

Then, we have to decide the question's difficulty level according to Bloom's taxonomy's stages including six difficulty levels: remembering the knowledge (which is the most basic level), understanding, implementation, analysis, evaluation and production (which is the highest level). The questions' difficulty in tests are usually in the three first levels of the taxonomy. For example, see table 3:

2. Writing. For example, phrasing the multiple choice question—each question has stem and four distracters. Only one distracter is correct and the others are not correct.

3. Validation. The question's stem and the correct distracter have to be validated by the literature obligated by the syllabus. The same importance must be given to confirm that the other set distracters are not correct and do not appear in literature.

Table 3

*Respiratory diseases*

Subject	Knowledge/remembering	Understanding	Implementation	Total
Prevention				
Intervention				
Guiding				
Total				

4. Proofreading—conform that the question the lecturer wrote is structured as he intended and it is unequivocal.

B. Performance in test level:

In this level, the process is very similar to the lecturer's level process, which by its end a fair and valid test that reflects the learners' knowledge in the study unit must be produced.

1. Planning—All the test domains are spread according to the syllabus and the number of questions in each domains is calculated. The number of questions is derived from the content and the time frame. A broader test map is built according to the domains included in the test.

2. Writing and validation—The validated questions which was written in the lecturer's level are entered to the test.

3. Proofreading—is performed when the test is ready and a MASTER form is issued and the base for printing the tests to the learners.

It was decided in the nursing school that prior to print, each test is checked by the test system manager, who serves as a quality guard and as a gatekeeper, check the test in terms of: formulation, difficulty, structure, repeating questions, spelling errors, proofreading. If there is unclear distracter, or unclear question he stops the process and the question is returned for clarification. The question may be fixed or replaced. If the questions are clear, the test is approved for further printing to the learners.

### Stage 3—Control

This stage is done after the students answered the test and prior to the grades' publication.

The students' response sheets are collected and sent to segmentation and test results. This stage is computerized and done outside the organization.

The study unit coordinator receives the test segmentation results and begins to review the statistical results of each question separately and of the entire test. At this stage, each question's correlation (positive or negative) is examined. A question that its indices are not good goes back to the lecturer who wrote the question for reconsideration. At this stage, the phrasing, the distractions, and the answer the students chose are compared to the study material and the literature. After the review, they decide what to do about the question. If the question is good and the learners did not know how to answer it, they think how to supplement/reinforce the learner's missing knowledge. If there is an additional correct distracter, they accept it. At the end of the control stage, which may be a little long, the test results are published.

After several experiences like this, an institutional work directive was written describing and documenting proper conduct in the process of producing a uniform and agreed test. The procedure was written in cooperation with the Quality Control and Risk Management Department to make it clear and detailed. Figure 1 describes a process of creating a test. Figure 2 presents a schematic description of control process of test items analysis. Process's advantages and disadvantages are listed in Table 4.

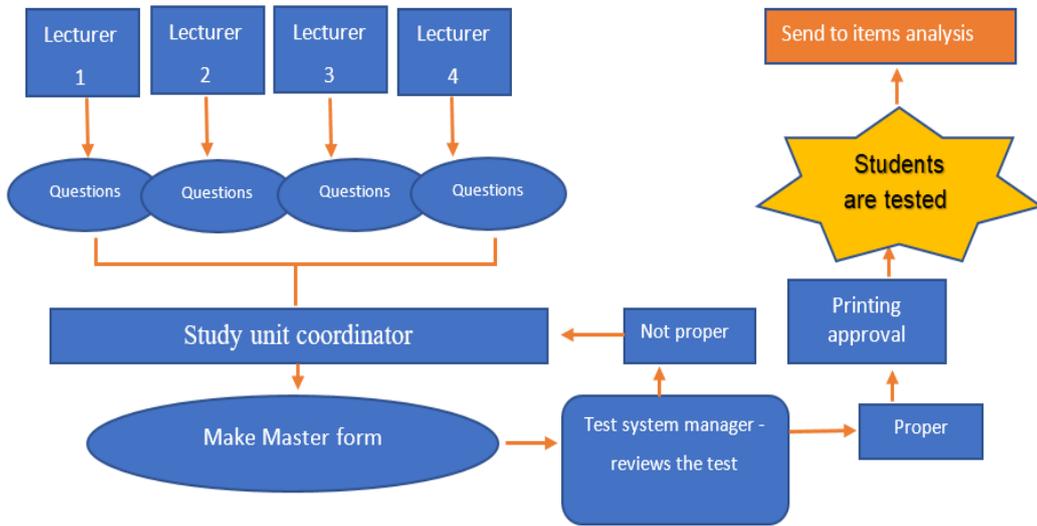


Figure 1. Schematic description of test creating process.

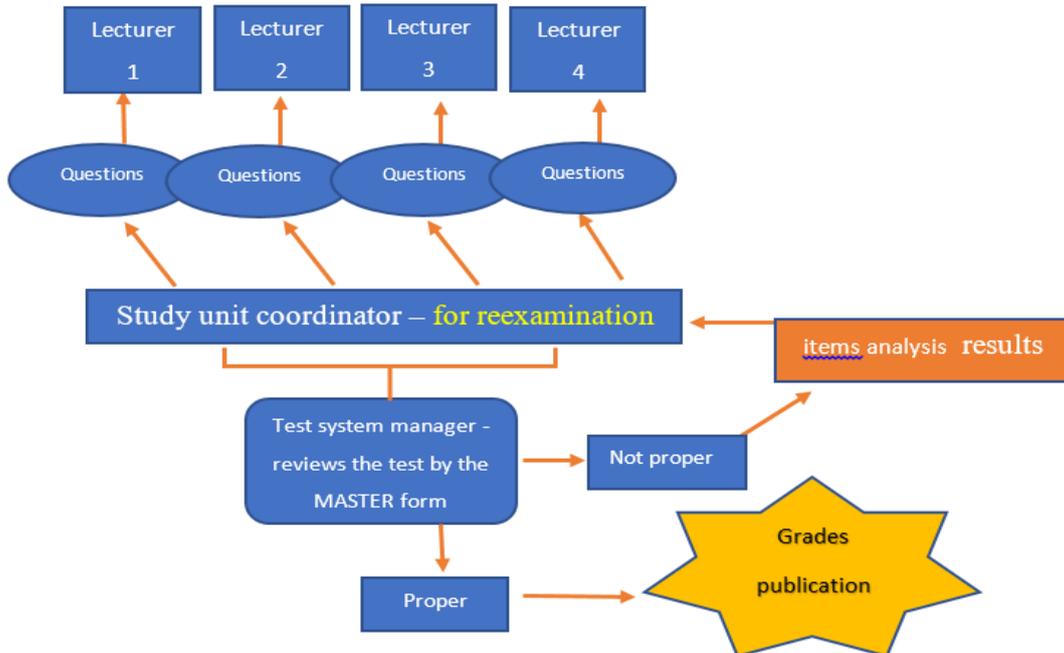


Figure 2. Schematic description of control process of test items analysis.

A working procedure is an internal organizational document that specifies and defines the policy and implementation methods. The procedure serves as a control standard, defines areas of responsibility and authority, and internal communication means. The procedure has advantages and disadvantages. Its advantage is the regulation and clear and institutionalized division of organizational activity between the staff members it causes and its prevention of misunderstandings and intra-organizational struggles. Keren claims that in small organizations, communication is often good and open, and therefore there is only a small need in procedures. The larger the factory, the bigger the units, and therefore, there are many partners that may cause tensions between them. The management enables control and supervision of the activity (Yehezkealiy & Shalev, 2012).

Table 4

*Process advantages and disadvantages*

The process's advantages	The process's disadvantages
1. The process creates uniformity in the staff. Everyone knows how to proceed.	1. A long process involving several staff members—not all staff members are available. This requires prior coordination and deployment.
2. Since the test goes through several controls, it reduces the wrong questions.	2. Delay in grades publication—due to the process length (which is important for the test's second session).
3. Through the control process, the team learned to refine the question and clarify what they want to examine.	3. The test system manager goes through a tiring and long process—It is not easy to read several tests and keep being focused. Errors can be missed.
4. The staff learned to pay attention to phrasing and the language they use.	
5. The test results are more reliable and it allows identifying the study area in which the learners have difficulties and deciding about required intervention.	
6. The process creates team work and cooperation.	

### Survey and Recommendations

Following this process, a survey was performed among nurse educators in nursing school, which examines the process of assimilating test creation in school level, the survey's results are:

11 nurse educators replied ( $n = 11$ ), their answer are summarized in Table 5:

Table 5

*Survey results*

Item	The statement:			
1	Rate how familiar you are with the principals of writing a multiple choice test	90.9% (10 persons) Definitely familiar	9.1% (1 person) Partially familiar	
2	Evaluate how successful you are in writing test questions according to the principles studied	63.6% (7 persons) Independent	36.4% (4 persons) Need partial help	
3	Evaluate your ability to plan and build a test map	63.6% (7 persons) Very much	27.3% (3 persons) Partially	9.1% (1 person) Cannot
4	Evaluate how satisfied you are with your ability to understand the test items analysis	45.5% (5 persons) very much understand	36.4% (4 persons) Partially understand	18.2% (2 persons) Do not understand
5	Rate how much the test-building process has affected your teaching quality	18.2% (2 persons) Very much affected	54.5% (6 persons) Partially affected	27.3% (3 persons) Do not affected
6	How clear and structured is the test producing process in school	72.7% (8 persons) Very clear	18.2% (2 persons) Partially clear	9.1% (1 person) Not clear at all
7	Rate how necessary, in your opinion, is the production and testing process	100% (11 persons) Very necessary		
8	How much do you feel you need to get further guidance/additional knowledge?	18.2% (2 persons) To a great extent	63.6% (7 persons) Partially	18.2% (2 persons) Not needed

It is recommended to develop in each organization a test system including several staff members who are skilled in development and refreshing of the field.

### Conclusions

The process of writing a multiple-choice test requires knowledge and proficiency. This data shows:

1. It is necessary to strengthen the knowledge and widen the issue of test producing process beginning with the test structure and phrasing question and distracters to the level of understanding the test results analysis.

2. It may be seen that there is assimilation, but it requires continue working with the staff. May be the difficulty is in new staff members (which the survey did not check and therefore difficult to conclude).

3. There is a regulated institutional procedure describing the procedure but staff members still have difficulty in this skill.

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