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| Project title | New Professional Diploma in Plant Clinic and Phytosanitary Technologies (PRO-DPCP) |
| Project No | 609550-EPP-1-2019-1-BG-EPPKA2-CBHE-JP |
| Work Package | WP4 – Development of the curriculum |
| Outcome 4.2. | DEVELOPMENT OF TEACHING METHODOLOGIES SUITABLE TO DPCP DIPLOMA PROGRAM |
| Dissemination level | Internal |
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| Outcome | 4.2. | |
| Title | Development of teaching methodologies suitable to DPCP diploma program | |
| Type | <input type="checkbox"/> Teaching material <input checked="" type="checkbox"/> Learning material <input type="checkbox"/> Training material | <input type="checkbox"/> Event <input checked="" type="checkbox"/> Report <input type="checkbox"/> Service/Product |
| Description | <p>Description of task: Innovative methodologies for HE teaching at EU-partner universities will be adopted and entered in the diploma program resource platform. These methodologies are especially addressing Phytosanitary and plant health. Selecting appropriate teaching/learning methods for achieving our educational aims and learning outcomes. It begins by re-visiting the model of the systems approach to instruction. Next, it reviews the full range of teaching methods and an analysis of the educational strengths and weaknesses that are available to the modern lecturer, showing how they can be divided into 4 broad categories –</p> <ol style="list-style-type: none"> 1. Mass-instruction methods <ul style="list-style-type: none"> - Lectures and similar expository techniques - Film and video presentations - Educational broadcasts - Mass practical and field work 2. Student-centred learning, <ul style="list-style-type: none"> - Directed study of material in textbooks, etc. - Paper-based self-study materials - Self-instruction via mediated materials - Computer-based learning and multimedia - Individual assignments, projects, etc. - Individual practical and field work 3. Group-learning methods. <ul style="list-style-type: none"> - Buzz sessions and similar small-group activities - Class discussions, seminars, group tutorials, etc - Participative exercises of simulation/case study - Mediated feedback/discussion sessions - Group projects - Self-help groups 4. Problem-Based Learning (PBL) New Facilitator Training The objectives of the PBL program are to: <ul style="list-style-type: none"> - Develop learning and communication skills, including problem-based and self-directed learning, critical reasoning, teaching and group skills. - Integrate basic science knowledge with clinical medicine. - Identify and explore learning opportunities that may not be available in the rest of the curriculum. - Establish attitudes and skills that will create a strong foundation for life-long learning. Effective Use of IT in Teaching, Learning, and Research Academic Technology offers yearly sessions to develop skills on using technology to enhance teaching—for example, learning how to use tools such as MOODLE software, Web Diver, E-portfolio, VUE, and Audience Response System. INPUTS: 2 academic senior staff from each partner universities + 3 EU acad. Staff from IT and HU Venue: P2 UNINA Univ, Italy/1 workshop Expected Deliverable: reports on proper Teaching methodologies (En/Ar) | |
| Due date | 2nd week of M8 | |

The TEACHING METHODOLOGIES SUITABLE TO PRO-DPCP PROGRAM are intended to be used by the teachers in the Professional Diploma Program in Plant Clinic and Phytosanitary Technologies, in their capacity as responsible for teaching and training students in the courses/subjects, included in the Curriculum of the accredited program at the EG partners' universities.

During the meeting held at Alexandria University, in the presence of representatives of all Egyptian universities participating in the project, teaching methods that can be used to achieve the targeted educational outcomes were discussed. The teaching methods of the European partner universities were also taken into consideration. It has been stressed the need to adopt innovative methodologies for teaching students who are registered to get Diploma in "Plant Clinic".

Effectiveness of various teaching methods used for teaching students at the graduate level

There are some differences between traditional and modern teaching methods: In traditional teaching methods, the learner has a more passive role and learns by listening to lectures. Emphasis is placed on memorization. Modern teaching methods and strategies involve the learner in the process by offering an array of collaborative activities where the learner actively participates and explores the topic on their own, all the while enhancing essential life skills.

The benefits of using modern teaching methods could be summarized as follows: Modern teaching methods are more engaging and effective. The learner is actively involved and therefore remains engaged, develops a deeper understanding of the topic and a stronger sense of accomplishment. Learning is assessed and confirmed based on actual results.

Because modern teaching methods allow students to explore in-depth and fascinating ways new topics, students are more likely to discover their true inclinations and develop new interests. It allows for more creativity and self-discovery, as students often challenge themselves.

Teaching and learning are the two sides of a coin. The most accepted criterion for measuring good teaching is the amount of student learning that occurs. The phrase T-L model of teaching implies that teaching and learning are integrally related acts.

Depending on the T-L method chosen by the teacher, his/her role and the role of the student will differ as shown in the table below:

| T-L Method | Role of Teacher | Role of Student |
|--|--|---|
| Mass-Instruction (conventional lecture/mass-practical-demonstration class/video broadcast etc.) | Traditional expository role. Controller of all aspects of Instruction process (style/content/pace) | Largely passive. Practically they are dependent on what they are getting from the teacher. Little scope for interaction. |
| Individual learning (Directed study of texts, study of open-learning materials/CBL/ individual assignments etc.) | Producer/manager of learning resources. Tutor & guide. Provides support when required. | Active. Responsible for own learning. Individual students control their own pace of learning & depth of study. |
| In-Group learning (Buzz-sessions, seminars, group projects, group assignments, tutorials) | Organizer of group activity. Facilitator of the learning experience. (supportive role) | Active. Responsible for own learning. Strongly dependent on one another's preparation & interaction. |

The chosen appropriate teaching methods to achieve our educational goals and learning outcomes, in light of what is included in the project proposal are:

Mass-instruction methods

- Lectures and similar expository techniques
- Film and video presentations
- Educational broadcasts
- Mass practical and field work

Student-centered learning

- Directed study of material in textbooks, etc.
- Paper-based self-study materials
- Self-instruction via mediated materials
- Computer-based learning and multimedia
- Individual assignments, projects, etc.

Individual practical and field work

Group-learning methods

Buzz sessions and similar small-group activities

Class discussions, seminars, group tutorials, etc

Participative exercises of simulation/case study

Mediated feedback/discussion sessions

Group projects

Self-help groups

Problem-Based Learning (PBL)

New Facilitator Training The objectives of the PBL program are to:

Develop learning and communication skills, including problem-based and self-directed learning, critical reasoning, teaching and group skills.

Integrate basic science knowledge with clinical medicine.

Identify and explore learning opportunities that may not be available in the rest of the curriculum.

Establish attitudes and skills that will create a strong foundation for life-long learning.

A.THEORETICAL TRAINING

Most of the students are rating the lecture method as the best teaching method because the teacher provides all knowledge related to a topic, it is time-saving method, and students listen to lectures attentively and take notes etc.

Lecture Method: A lecture is a talk or verbal presentation given by a lecturer, trainer or speaker to an audience. With all the advancement of training systems and computer technology, the lecture method is still a backbone widely used in teaching and training at higher levels of education. This method is economical, can be used for a large number of students, material can be covered in a structured manner and the teacher has great control of time and material. A classroom lecture is a special form of communication in which voice, gesture, movement, facial expression, and eye contact can either complement or detract from the content (Davis 1993). McCarthy, (1992) in the article “Common Teaching Methods” stated the strengths of the lecture method are that it presents factual material in a direct, logical manner, contains experience that inspires, stimulates thinking to open discussion, and is useful for large groups. Sullivan & McIntosh (1996) said that with planning and effective presentation techniques, the lecture can be a highly effective and interactive method for transferring knowledge to students. The lecture gives the students training in listening and taking rapid notes.

Tips and techniques for improving lecture method:

- Lecture material should be stimulating and thought-provoking.
- Information should be delivered dramatically by using examples to make it memorable.
- The teacher needs to use questions throughout the lecture to involve students in the learning process and to check their comprehension.

- Reinforce learning by using visual supports like flip charts, whiteboard/blackboard etc.
- Teacher should take feedback from students to improve lecture method.

Group discussion:

Discussion: It is a free verbal exchange of ideas between group members or teachers and students. For effective discussion, the students should have prior knowledge and information about the topic to be discussed. McCarthy, P. (1992) stated strengths of class discussion as; pools of ideas and experiences from the group and allows everyone to participate in an active process. Kochhar (2000, p.347) stated that; a problem, an issue, a situation in which there is a difference of opinion, is suitable for discussion method of teaching. Our study also revealed that the students rated group discussion (class discussion) as the second best method by giving reasons that; it has more participation of students, the learning is more effective, the students don't have to rely on rote learning, every student give his/ her opinion, and this method develops creativity among students.

Tips and techniques for improving discussion method:

- The teacher should spend sufficient time preparing the process and steps of discussion.
 - Different aspects of the topic and the parameters should be selected for the focused discussion.
 - Sufficient time should be allotted to discuss all the issues. At the same time, students should know the time limit to conclude.
 - The teacher in the beginning should introduce the topic, the purpose of the discussion, and the students participating in the discussion.
 - Before the start of the discussion, background information about the topic should be provided.
 - There is a need to include questions to provide direction.
 - A relaxed environment should be created to foster the process of discussion.
- The teacher after opening the discussion should play the role of a facilitator involving everyone and at the end should summarize the discussion.
- Encourage students to listen to other's points of view and then evaluate their own.
 - The teacher should give value to all students' opinions and try not to allow his/her difference of opinion, prevent communication and debate.

Case Study: This method is basically used to develop critical thinking and problem-solving skills, as well as to present students with real-life situations. The students are presented with a record set of circumstances based on actual event or an imaginary situation and they are asked:

1. to diagnose particular problem(s) only.
2. to diagnose problem(s) & provide solution(s).
3. to give reasons & implications of action after providing both problem & solution

It is a time consuming method and sometimes the case does not actually provide real experience. It could be in-conclusive, and insufficient information can lead to inappropriate results. At the end, the students want to know the right answer by the teacher. The role of the teacher in conducting the case study should be to:

- read the case and determine the key problems faced by the decision maker,
- determine the data required to analyze the problems and for a synthesis into solutions,
- develop, analyze, and compare alternative solutions, and recommend a course of action

Tips and techniques for improving Case Study method:

- Cases should be brief, well-written, reflect real issues, and open to a number of conflicting responses.
- Students should work in group to prepare a written report and/or a formal presentation of the case.

Brainstorming: It is a loosely structured form of discussion for generating ideas without participants embroiled in unproductive analysis. It is a very useful technique for problem solving, decision making, creative thinking and team building. It develops listening skills.

Tips and techniques for improving Brainstorming method:

Ground rules for running brainstorming session include:

- There should be no criticism and the wild ideas should be encouraged and recorded without evaluation.
- Emphasis should be placed on quantity of ideas and not the quality.
- There is a need of equal participation of members.
- It can be unfocused so teacher should know how to control discussion and facilitate issues.
- It works well in small group

Assignment method: Written assignments help in organization of knowledge, assimilation of facts and better preparation of examinations. It emphasizes on individual student work and the method that helps both teaching and learning processes (Kochhar, 2000, p.358).

Tips and techniques for improving Assignment method:

- Teacher should describe the parameters of the topic of assignment.
- Fully explain assignments so that students know how to best prepare. When the inevitable question, "Will we be tested on this?" arises, make sure your answer includes not only a "yes" or "no," but a "because . . .".Shea, A. (2009).

B. PRACTICAL TRAINING

Practical/lab/field exercises.

In achieving the educational goals of the DPCP program the practical training is of major importance. Based on the review of the similar programs worldwide (4.1. activity), impressions from the Good practice visits for benchmark study to the EU partners (1.2. activity) and exchange of experience among all partners, the following good practices are outlined:

1. To prepare and maintain collections of insects, mites, nematodes, (both harmful and beneficial), phytopathogens, weeds, plant parts with symptoms of disease or damage by pests, etc. to complement the teaching of the theoretical part in the respective course.
2. To engage students to actively participate in the practical/lab/field exercises.
3. To give assignments for team practical work.
4. To train students on using specialized laboratory equipment and apply up-to-date methods and techniques for lab exercises.
5. To create and maintain close relationships with private/public sector to cooperate in different aspects of the training process (field trips, sharing experience in applying novel techniques and approaches, providing data for problem-based study/case study, internship placement). The Italian side indicated the importance of visiting some companies that apply the results of academics' research to solve production problems in those companies. This reflects a fruitful cooperation between academics and the production sector.
6. Where possible, to create and maintain training & experimental fields/orchards/plantations.

According to the regulations in force in Egyptian Universities to obtain a diploma degree, the study system is according to the following:

- A- To obtain a diploma degree in a specific discipline, compulsory and elective courses must be passed successfully, as well as field, applied and laboratory work completed within a period of not less than two semesters.
- B- Theoretical lessons may be offered through the electronic platforms of universities. Then the means of interaction between the student and the faculty member must be provided.
- C- The necessity of recording the student's scientific and training activities in the student's achievement file, and they are taken into account when evaluating the achievement of the targeted educational outcomes.