Guidelines Booklet For Using Modern Teaching Methods In Higher Education: METHODS Project Experience

METHODS

Co-funded by the Erasmus+ Programme of the European Union

Project Title:

Modernization of Teaching Methodologies in Higher Education: Eu Experience For Jordan And Palestinian Territory

Project acronym: METHODS

Project Number: 561940-EPP-1-2015-1-JO-EPPKA2-CBHE-JP

Funding scheme: Erasmus+ Programme (Capacity-Building projects in the field of Higher Education (E+CBHE))

Start date of the project: 15/10/2015 Duration: 36 months

Deliverable title	Guidelines for METHODS courses		
Author(s)	Rikke Magnussen and Lutfi Al-Sharif		
Organisation name(s)	Aalborg University, Copenhagen and University of Jordan		
WP Number	3		
WP Leader	Associate Professor Rikke Magnussen		
Due date of delivery		Project month	
Submission date		Project month	
Total number of pages			

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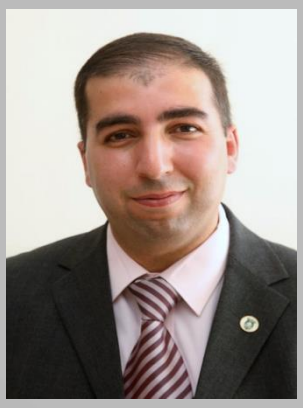

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The Hashemite University

An-Najah National University

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Leipzig University of Applied Sciences

University of Deusto

Plovdiv University

Universitat de Girona

World University Service of the Mediterranean

Jordan University of Science and Technology

Bethlehem University

Al-Zaytoonah University of Jordan

Aalborg University Copenhagen

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1. INTRODUCTION

The focus of this manual is to provide guidelines to educators on how to implement problem and ICT based learning elements into teaching at higher education in Jordan and Palestine. It was produced as part of The METHODS project, the overall focus of which is on modernization in teaching methodologies in higher education in Jordan and Palestinian territory, EU-experience (Al-Salaymeh & Ghanem, 2014). More specifically, this manual stems from work package 3, which focuses on capacity building and educational design.

The guidelines are based on studies containing observations of developed courses and interviews conducted with students and faculty members at universities in Jordan and Palestine throughout September 2016 – December 2017. The results of these studies and resulting recommendations are presented in Appendix B.

The remaining chapters contain guidelines to implementing Problem and Competence based Learning (PBL and CBL), Flipped Classrooms and Massively Open Online Courses (MOOCs) in courses in higher education. In the conclusion we present recommendations for future studies and big scale implementation of Problem based ICT education in higher education in a Middle Eastern context.

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2. Benefits of Implementing Modern Teaching Methods

The following are the envisaged benefits of adopting modern teaching methods:

1. The student becomes a more active participant in the class. He/she will become more interested in the class.

2. The student will become a more active learner and will rely on himself/herself in finding material and researching it online.

3. The student spreads his/her study over the whole semester instead of cramming all the material in a couple of days before the exam.

4. The lecture time is freed up to work on more creative and interactive activities which take the student to more advanced activities.

5. The lecturer is no longer under time pressure to finish the material in the class and he/she can give more time to students' questions, as well as being able to provide more support to students that need it.

6. During the class the lecturer can identify the weaknesses that students have and the areas that they find difficult to understand (as opposed to the current situation where weaknesses are only revealed during the mid-term or final exams). This allows him/her to clarify the difficult concepts.

7. There will be more interaction between the lecturer and the students during the class time and more interaction between the students themselves.

8. It is possible to bring in guest speakers to the lecture. They would present a problem from the industry or discuss a design. This would be highly motivational for the students and provide greater real-world applicability to their studies?

9. A forum (e.g. emodo) must accompany the material, that allows students to discuss difficult issues online or ask the lecturer specific questions.

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3. FLIPPED CLASSROOM

(John Traxler, University of Wolverhampton)

In a flipped classroom, the typical lecture and homework elements of a course are reversed, readings and lectures are pre-done by students at home, while classroom sessions are devoted to exercises, projects, or discussions about the material.

Other characteristics of flipped classrooms

- Moving from an instructor-centred learning environment to a student-centred learning environment.
- Moving from lecturer to facilitator
- Shifting from individual to collaborative tactics
- Focus on the student
- May or may not include technology

Introduction

The flipped or inverted classroom was originally an American conception and was a response to various practical and pedagogic challenges (principally those of encouraging autonomous active learning, discussions about Bring Your Own Device (BYOD) and increasing pressure on contact time) and a response to a specific infrastructure and technical environment (namely the widespread availability of cheap connectivity and personal, social and domestic digital technologies).

Whilst an underpinning theory of the flipped classroom may have emerged subsequently, the idea was nevertheless originally nationally specific and culturally specific, and so the documented experiences come originally from a very specific setting, namely schools in America.

The peer review exercise is a great opportunity to test and adapt these principles and experiences to the culture, institutions, infrastructure and demographics of subjects taught in selected module.

The flipped classroom concept should not be interpreted merely as using technology to displace the consumption of content out of the classroom. In some senses, the principles of the flipped classroom can be expressed as the following questions or challenges,

- How can we optimise the face-to-face learning experience? What is it that students can only get face-to-face with lecturers?

- How can we optimise the ways in which students can learn from each other face-to-face? What is it that students can only get face-to-face with each other?

- How can we optimise the campus experience? What is it that students can only get by coming on campus?

And,

- How can digital technology support addressing these challenges? And what does digital technology do most effectively?

Clearly the exact nature of the flipped classroom in any specific institution and culture will depend on a clear analysis of the infrastructure, technology, coverage, tariffs and access of students (and staff) (and other objective or external factors) and on the attitudes, experiences, aptitudes, competences, preferences, priorities and aspirations of students

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(and staff) (amongst other internal or subjective factors). The implementation of the flipped classroom will obviously depend on understanding the pedagogic preferences, limitations, expertise, expectations, resources, experiences and objectives of the university, its lecturers and its students.

Preparation,

Look at the videos

- https://www.youtube.com/watch?v=r2b7GeuqkPc
- https://www.youtube.com/watch?v=G_p63W_2F_4
- https://www.youtube.com/watch?v=isAx0c8GDV0
- https://www.youtube.com/watch?v=qdKzSq_t8k8

and the websites

- https://www.knewton.com/infographics/flipped-classroom/
- http://www.freetech4teachers.com/2017/03/7-great-tools-for-creating-flipped.html#.WMuyjxicbeQ
- http://www.uq.edu.au/teach/flipped-classroom/what-is-fc.html
- https://www.heacademy.ac.uk/enhancement/starter-tools/flipped-learning-0
- http://educationnext.org/the-flipped-classroom/
- http://www.bbc.co.uk/news/technology-30814302

and OER

- https://www.oercommons.org
- http://www.open.edu/openlearn/
- https://www.ucl.ac.uk/oer/projects
- http://unow.nottingham.ac.uk
- http://oer.educ.cam.ac.uk/wiki/Home
- https://ocw.mit.edu/index.htm

Prepare to discuss,

- Is your teaching didactic or discursive? Are you an expert? Are you a facilitator? What are your teaching activities (lecture, seminar, laboratory, tutorial, fieldwork, assessing, feeding-back)?
- What is your relationship with your students? Collaborative, consensual, authoritarian, revered, didactic?
- How do your students learn? In groups or alone? On-line, on campus, at home, commuting? Using university resources, their own resources or external resources?
- How do you assess your students? What skills, attributes, competences and knowledge are you assessing? Is your assessment formative as well as summative?
- How mature, self-directing, intrinsically motivated or ambitious are your students? What about their digital skills and meta-cognition?

Outline of Workshop Tasks,

- Think of a topic, a level, a group of students that you know. Think of an outcome or objective. **Record these in your notes.**
- Identify online

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    - Content – video, audio, textual resources; blogs, apps.
    - Groups – Facebook groups, listservs, SIG
- Develop tasks, topics, activities for individuals and groups off-campus/out-of-classroom exploiting these online resources
- Identify expectations, outcomes, products, deliverables for return on-campus
- **Report back** with your flipped classroom.

References

- Herreid, C. F., & Schiller, N. A. (2013). Case studies and the flipped classroom. Journal of College Science Teaching, 42(5), 62-66.
- Bishop, J. L., & Verleger, M. A. (2013, June). The flipped classroom: A survey of the research. In ASEE National Conference Proceedings, Atlanta, GA (Vol. 30, No. 9).
- Milman, N. B. (2012). The flipped classroom strategy: What is it and how can it best be used?. Distance Learning, 9(3), 85.
- Abeysekera, L., & Dawson, P. (2015). Motivation and cognitive load in the flipped classroom: definition, rationale and a call for research. Higher Education Research & Development, 34(1), 1-14.

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4. NOTES ON PROBLEM BASED LEARNING

(Rikke Magnusson, Aalborg University)

"*Problem Based Learning* is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging and complex question, problem, or challenge." Problem based learning is often characterised by the following:

- Built around group work
- Based on open-ended problems
- It ends with a project report
- The course material given in class supports the project work
- Students are responsible for their own learning achievements

Different constructions of PBL

- How control and power is distributed between participant and teacher
- Can vary between educations, disciplines, institutes, universities
- E.g.: Are learners given a particular problem to solve or do they define the problem themselves?
- Who manages the work process?
- Who decides what theories and methods to choose?
- To what degree is the solution open-ended or fixed? Are students to come up with a pre-defined solution or are they developing new knowledge and insights?

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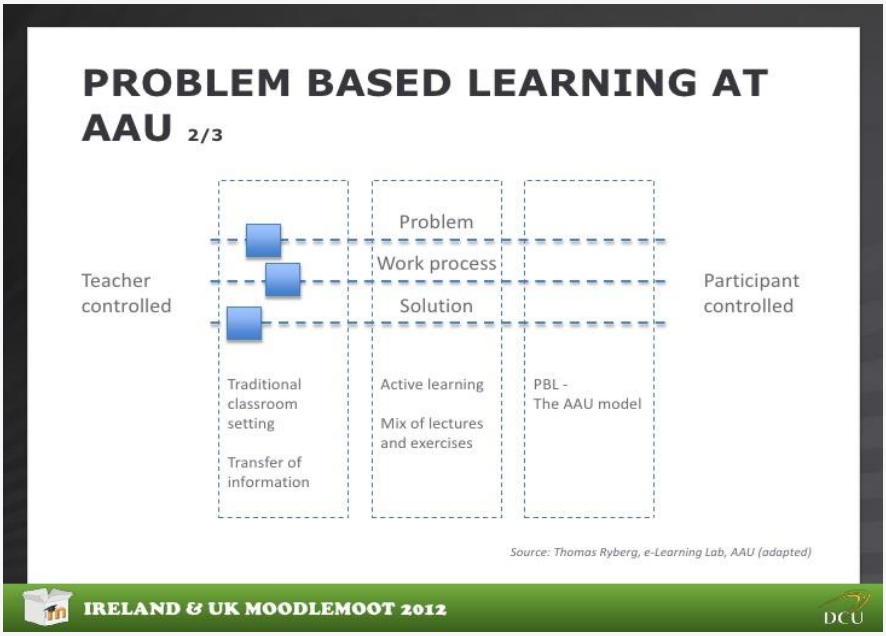

Figure 3: Different constructions of PBL

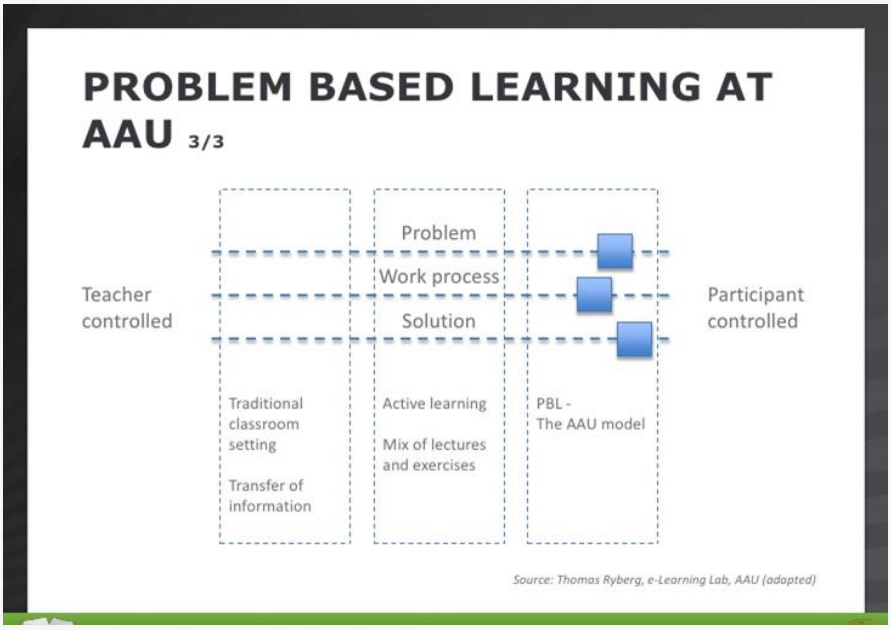

Figure 4: Different constructions of PBL

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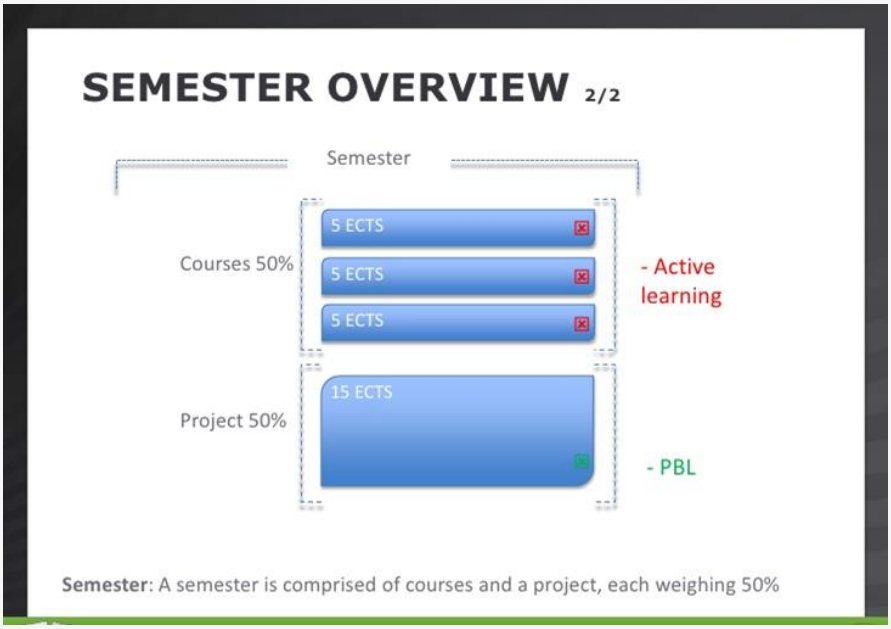

Figure 5: Course structure at AAU

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5. NOTES ON COMPETENCE BASED LEARNING

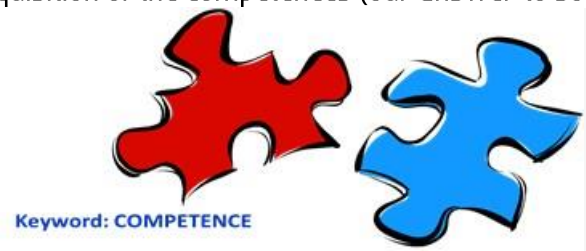
(J. Juandó & M.L. Pérez-Cabaní -WUSmed)

- Why Competence Based Teaching (CBT)

The main goal of CBT is to offer an efficient way to plan, teach and evaluate by competences, useful for educators from different educational levels and context.
CBT can be used individually for a course or subject, or collectively for a whole program.

- The teaching process based on competences

- To define our desired competences (our commitment to society)
- To design learning activities orientated to the required competences.
- To design evaluation activities able to reflect the level of competences acquisitioned (learning outcomes).
-The certification of the acquisition of the competences (our answer to society)



- Competence formulation

-Using verbs of intentioned actions.
-As complex actions that we expect from our learners.
-Easily and directly evaluable.
Verbs meaning intentioned and observable actions like to apply, to assess, to develop, to identify, to plan, to use, to design, to compare, are the classical good verbs to formulate competences.

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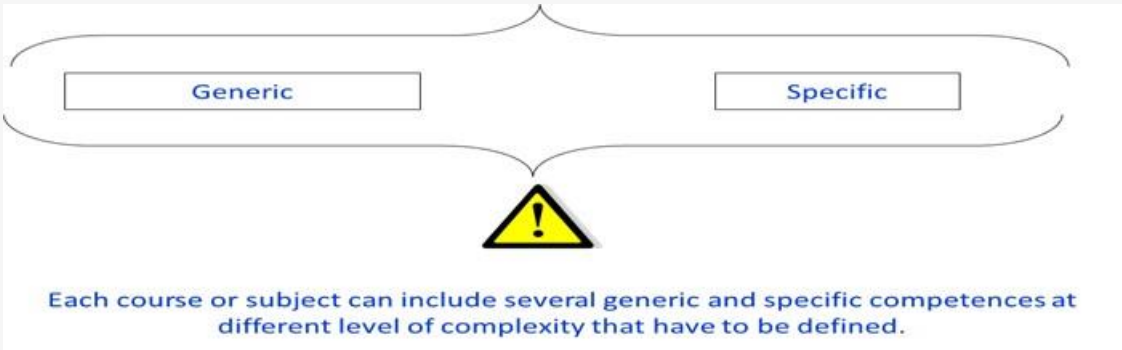
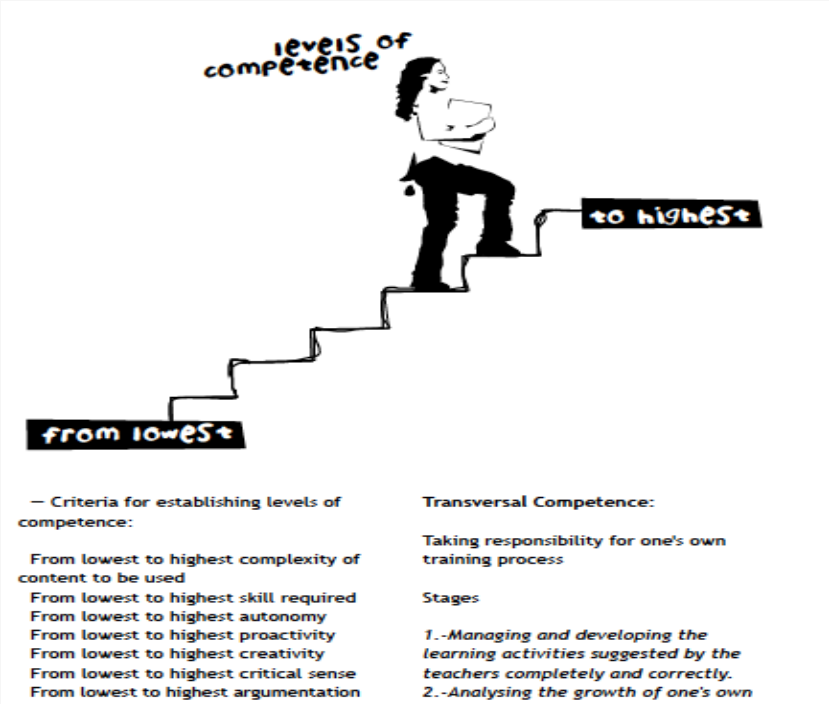
- Types of competences



- Levels of competence



- Competences bedded in the curriculum through learning activities

Once the competences we want to develop in our course/subject/program are defined, the second big step is landing in the curriculum linking each competence with learning activities.

- The core competences in Methods programmes

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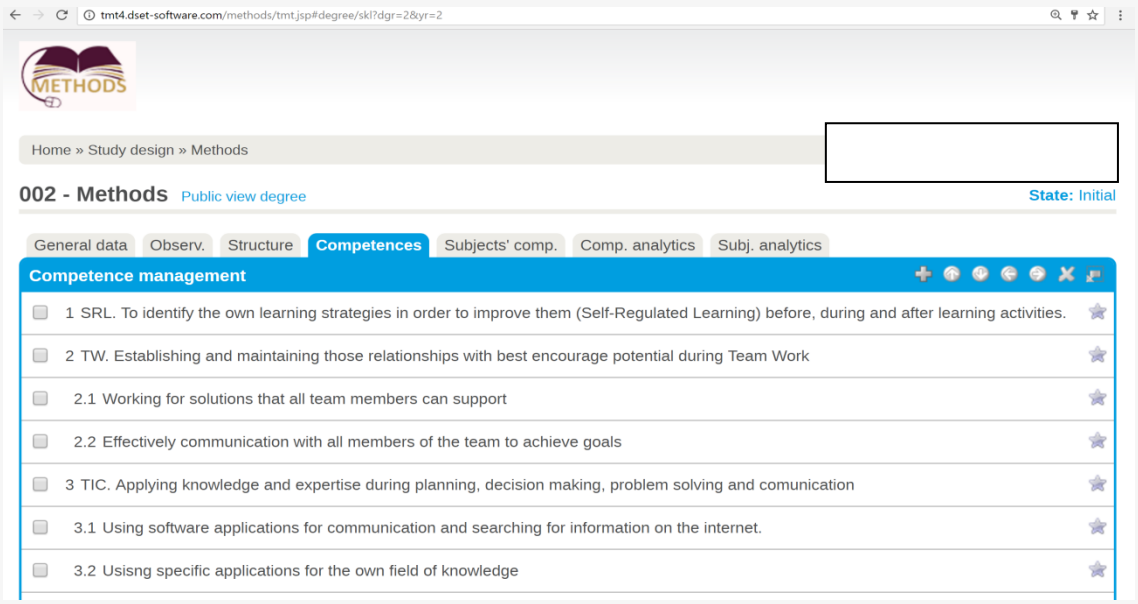
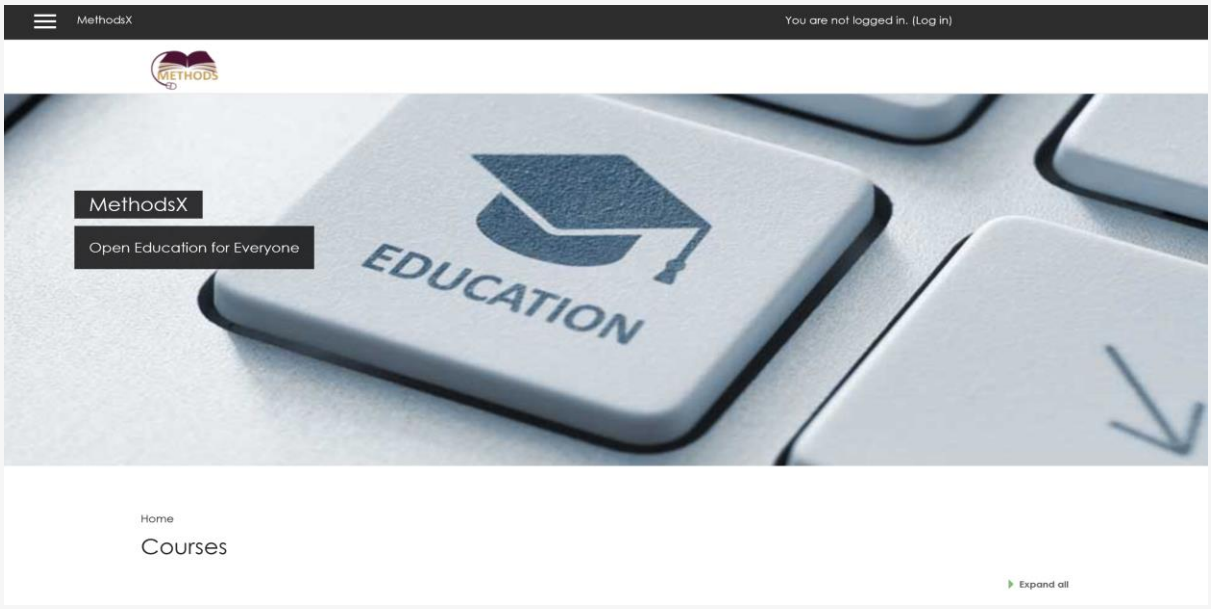


6. METHODSX Platform

Moodle has been used as the best choice for the platform for the METHODS courses. Thus the platform uses Moodle and is called MethodsX. A screenshot of the first page of the site is shown in the figure below.



All the METHODS pilot courses have been uploaded onto the platform. Using the platform is easy as it identical to Moodle, which is used by all Universities in Jordan and Palestine.

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7. Challenges and Warnings

The following list includes a list of typical challenges that could be encountered by lecturers deciding to adopt the METHODS format:

1. The effort required by the students was perceived to be excessive by some students. Most students had previously been used to simply sitting a mid-term exam and a final exam. Some students also decide to take up a part time job, which can further restrict their time for independent learning.

2. The number of hours that need to be expended by the lecturer are large compared to the conventional method (180 hours for one of the case studies).

3. The lecturer must provide online material that is suitable for students to use. This could be in the form of pdf files or videos. In one case study, all the material was available online as You Tube videos and pdf files. The material was very appropriate to the course, as it had already been prepared by the lecturer himself. The same might not be true for other courses and this would present a serious challenge to the feasibility of "flipping" the classroom.

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8. The Eight Suggested Steps in Planning and Preparing a METHODS Course

This section lists a suggested set of steps to be followed in developing a METHODS course. The order of the steps is indicative only and can be changed by the users as they see fit.

Step 1: Decide what Modalities and Activities will be used: It is not sufficient to simply upload the material onto the Learning Management System (LMS) and deliver the material in the conventional way (the conventional way is the method whereby the lecture delivers a 50-minute lecture to the students and they ask questions at the end). You are expected to adopt one or more modern teaching methods such as:

a. Problem based learning.
b. Flipped Classrooms.
c. Project Based Learning.

Step 2: Decide on the Necessary Competences: It is appropriate at this stage to decide on the required competences that the student must attain once he/she has successfully completed the course. At this stage it is only possible to detail the list of competences, without the details of how they will be assessed. Once the assessment methods have been decided (see Step 6 below about the methods of student assessment) a matrix can be developed that shows each of the competences can be tested using the different assessment methods (e.g., competence number 1 can be tested in the first written exam and in the practical project).

Step 3: Choosing a Learning Management System Platform: : You will need to decide what learning management system you will use. This is the platform onto which the learning material will be uploaded. Moodle is a platform that is widely used by many universities and is open source. It allows you to upload material, as well as run quizzes for students and create forums for discussion.

Step 4: Prepare the Learning Material: You need to start preparing the material that will be used by students to learn. This could include pdf files that explain the material, give examples and contain problems and tests. It could also include videos (or links to videos) that explain the material in simple terms.

Step 5: Upload the Material onto the Learning Management System (LMS):): Once you have decided on the learning material that you will use, then you need to upload the material onto the LMS and make it accessible to the student registered on the course.

Step 6: Decide the Methods of Student Assessment: This step is closely linked to the previous step. It is strongly recommended to adopt different and varied methods of student assessment. This is due to the fact that different students learn in different ways and excel in different types of skills.

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Once you have designed the assessment methodology, you can link the assessment methods to the competences developed in step 4 using a matrix.

Step 7: Develop the Course Outline: At this stage it is appropriate to develop the course outline. The course outline must specify the following:

1. An overview of the course.
2. The competences to be attained by the students.
3. An outline of the material to be delivered.
4. The mean of assessment (quizzes, projects, exams....).
5. A week by week outline of the material to be delivered.
6. Sources of materials for study as well as notes and textbooks.

Step 8: Plan the Delivery of the Course: Plan what you are going to do in each of the lectures and what in-class activities you will set. Ideally, the planning should be very detailed if possible, stating what is going to be done in class and what material must be given to the students.

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9. Notes on the Hours Spent by Students in a Case Study

Introduction

This document contains a set of notes about the number of hours spent by students during a Methods course. This Methods course was run at the Mechatronics Engineering Department at the University of Jordan in the first semester (Fall Semester) of the academic year 2017/2018. The following are the details of the course:

- Course Name: Power Electronics and Drives
- Number of Credit Hours: 3 credit hours.
- Lecturer: Prof. Lutfi Al-Sharif
- Department: Mechatronics Engineering Department
- University: The University of Jordan.
- Type of Course: Compulsory Course, 4th year Undergraduate.

Delivery and Content

The lecture time was used as follows:

1. In class problem based learning: Students would be given a problem related to the material of the course and they would be asked to solve it in groups and then present the solution at the whiteboard to the whole class.

2. Course project: The students are asked to work in groups and then to pick a project from a list. The students then work on the project and find a suitable solution, prepare a report and a presentation and then present the finding to the class. They are assessed on the following points: technical content, quality and content of the report, their presentation, time keeping in the presentation, questions and answers after the presentation, and teamwork.

3. Flipped Classroom: The whole material is available online in the form of videos and pdf files. Students would study at home by watching the videos and reading the pdf files. They would then attend class and ask questions about the points that they did not understand from the materials.

4. Weekly Quizzes: Approximately, once a week, a quiz is set and announced to the students in a specific part of the curriculum (e.g., one quiz per chapter).

5. Problem Based Learning: One assignment was given to the students to solve outside the class. A practical real-life problem was given that can be solved using power electronics. The students were asked to research the problem and propose different solutions and then

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compare the different solutions listing their advantages and disadvantages. They would also recommend one of the solutions giving reasons.

6. Applications: The lecturer would dedicate around 4 lectures during the course to show videos and photographs of modern applications of power electronics in society today. The videos would be paused regularly during the lecture and discussions carried out, with students commenting or asking questions.

Notes on the European Credit Transfer and Accumulation System (ECTS)

Universities in Jordan have adopted the US credit hour system. A course with three credit hours involves 3 weekly contact hours over a 16 week semester. In practice, 45 hours of lectures are given, and the 16th week is used for running the final exams.

It is thus necessary to understand how the US credit hour system relates to the European Credit Transfer and Accumulation System (ECTS).

A typical course comprises 6 ECTS units. The duration of a course is 4 months. Generally, one ECTS unit involves a total of 25 hours of contact and non-contact hours. 8 hours of which are inside the class and the rest (17 hours) outside the class. Roughly 30 to 35% are inside the class and the rest are activities outside the class.

For example, a 6 ECTS course will comprise 150 hours in total. 30% of 150 hours is 45 hours. So 45 hours of class time over 15 weeks is 3 hours per week (which is equivalent to 3 US credit hours). The remaining time is 70% of 150 hours which is 105 hours (non-contact hours). This works out at 7 hours per week of activity time for the students outside the class.

Thus 7 hours per week of non-contact activities is expected of students for a 3 US credit hour course. This is a useful guide for the lecturer when setting assignments and assessments for the students.

Log of Hours Spent by a Student on this course

I asked one of the students to log their hours during the course. They provided me with an actual log and an estimate for future hours (until the end of the course). These are summarised in the table below.

Activity/Item	details	Non-contact hours (hours)	Contact hours (hours)
Lectures in class	3 x 15		45
Studying for the quizzes	6 hours per quiz, 8 quizzes	48	
Problem Based Learning Assignment		4	
Mid Term Exam		5	

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Final exam (estimated)		10	
Course Project		10	
		77	45

This gives a total of 125 hours (contact and non-contact) which is effectively equivalent to 5 ECTS units

10. Lessons Learnt

The following conclusions and lessons learnt from this pilot course. The first three are the most important.

a) Students learn much better by doing things themselves. Thus, every lecture should have something practical for the students to do.
b) Continuous assessment and feedback to students: it is important to run weekly quizzes to ensure that students study every week and stay up to date.
c) Students who have watched the videos prior to attending the lecture do NOT want to hear the same lecture repeated in class. They want the lecture time to be used for something more thought provoking and interesting.
d) Students need someone to help them help themselves, by encouraging them to attend class. Taking the register and following up with students is important.
e) Students learn in different styles, and thus it is important to allow them to learn in different ways by offering them a variety of activities and to assess them in different ways (projects; computerised exam; software.)
f) Electronic submission on Moodle gives students a sense of urgency and encourages them to submit assignments on time.

Appendix A: Seven Case Studies from the Partner Universities in Jordan and Palestine

Seven case studies from the partners in Jordan and Palestine have been compiled and ordered alphabetically according to the name of the institution.

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Bethlehem University Case Study

CASE STUDY FORMAT
FOR THE METHODS PILOT COURSES THAT WERE RUN IN THE FIRST (FALL) SEMESTER OF THE ACADEMIC YEAR 2017/2018

Note This template will be used as the basis for the case studies linked to the courses that were taught in the first semester of the academic year 2017/2018 in the eight partner Universities in Jordan and Palestine. The case will be collected and compiled in the manual of good practice that will be developed as part of the METHODS project. Each of the eight partner Universities in Jordan and Palestine is expected to pick one of its courses to be presented in this case study. It is hoped that the variety of these 8 case studies will provide guidance and ideas for further lecturers in developing their courses in accordance with the METHODS format.

Basic Information

Lecturer:	Mr Mahdi Kleibo
Department, School:	Business & Hospitality
Institution/University:	Bethlehem University
Course Title:	Human Resources Management
Course Code/Number:	BUSA314
Discipline/Degree:	BA
Year:	3rd and 4th year undergrads.
Compulsory/Elective:	Compulsory.
Credit Hours/ECTS:	3

Case Study Contents

1. Please describe the **context and details of your methods** course (s) also about your university / department and **typical students** on your courses.

Course context and details:

Human Resource Management (HRM) course **outline** the roles and functions of members of the human resources department, as well as educating others outside human resources, in how their roles include human resources-related activities. The student learn about the evolution in human resources management as we know it today. Emphasis is placed on the modern day importance of HRM and the new "corporate view" of the function.

The **aim** of this course is to empower student's **competences**, know how to identify how people become managers, what the role of the manager is and how to maximize their effectiveness in that role.

This course **designed** to prepare senior student for supervisory and managerial roles and, as such, deals with core skills involved in management. This includes delegation, managerial &

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leadership styles, motivation, chairing meetings, workplace counselling, staff development, identifying and managing conflict and negotiating skills.

Student **exposed** to practical situations and problem solving regarding areas of employee counselling, discipline and termination. Equal Employment Opportunity discussed in order for the student to understand its need, importance and the legal issues surrounding it. Real-life examples are offered throughout, with the variations in styles of management and leadership required by different organizations and different cultures taken into consideration.

The average characteristics to describe senior (3rd and 4th year) undergrad:

Student require further **guidance** on how to read, write, study, memorize, take notes, work with study groups, make good use of library and IT, time management, concentration, connect knowledge, research skills with knowledge on how to allocate resources, with presentation (show case) skills and develop collecting learning competences.

2. What **methods** modality did you use and why?

Teaching Methods Practiced:

Class time is devoted to exercises, projects, and discussions.

- Flipped Classroom
- E-learning & on-line learning
- Blended Learning
- Problem Based learning
- Project Based Learning

Why:

Course designed for efficient purpose that helps in framing future development of our student's competences for the local and international labor market needs, wants and demands.

I have chosen to apply the Performance Management Methodology in class because it is a powerful multi assessment (efficient and effective) teaching tool. It actually personalize modern teaching methods that assist to allocate and define the status ability and potential of each student, I call it **positioning**.

3. What learning and teaching **issues** or problems does the chosen modality address?

3.1 Learning issues

Student Based

Student learning relies on memorizing and wrote learning with no passion or interest which explains why the student forgets everything the next day after the exam.

3.2 Teaching issues

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Lecturer based
- Creative learning environment in class.
- Implement teaching & learning best practices.
- Interactive classroom using technology
- New teaching concept(s) Vs industry age education and values
- Collaborate in creating Cultural Change

In addition:
Explore the chances of inserting vocational training in our academic teaching mechanism. Better equip and qualify our students for smoother enrolment in the labor market (locally and internationally).

4. What did you do and how did you do it?

What:
By applying the Performance Management Methodology, I practiced psychometric tests, Interviews, Leaderless group discussions, In-basket techniques, management games and simulation exercises, role plays, presentations, with 360 degree feedback.

Basic types of interview I applied were: Situational, Job knowledge & Willingness to comply with job requirements.

How:
- Flipped Classroom
- E-learning & on-line learning
- Blended Learning
- Problem Based learning
- Project Based Learning

5. What changes, if any, did you make to the assessment?

Increased number of YouTube clips for students to watch and debate upon.

6. What further changes would you make if you could?

Replace John Holland Career & Vocational Choice & Ta3mal Career Finder Assessments with Self Scoring Emotional Intelligence and Personality Tests by Mark Daniel.

7. What were the **benefits** of the methods course and the changes made?
   7.1 To teachers?
   7.2 To learners?
   7.3 To the organisation?

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7.1 Teacher level:

-Ease of evidence management
-Tools to monitor progress and higher management implementation

Throughout the period I was conducting the activities within project-oriented learning, Each group worked on their own project theme, and at the same time they engaged with other groups and got exposed to external activities. At this stage METHODS manifested as an active tool that supports pedagogical designs that best demonstrate **Collective Intelligence.**

We qualify our students to the modern world values, teach those skills on how to be a creative individual who can communicate ideas and collaborate with others with enough pace to manage their own time.

Strength

- Assisted the lecturer to be a better presenter as it upgraded teaching performance.
- In the future it avoided giving the same lecture over & over again (time management) which created space to share quality teaching in class.
- Focused more on the class needs
- Engaged lecturer with confident students
- Identified advanced and less advanced learners.
- Able to target the students who really need help.
- Helped identify detailed misconceptions

7.2 Student level:

-Provided clarity around expectations
-Feeling of personal accomplishment
-Resulting from improved business results

METHODS Created Self-motivated Students. On voluntary basis, students attended 4 Saturdays during Fall Semester for extra training and learning. Each session consisted of 3 hours, all students attended knowing there will be no attendance sheet to sign or be measured upon. Encouraged (motivated) 16% of METHODS Students to apply for student exchange programmes & engaged with potential recruiters for training, internship and job opportunity after graduation.

Strength

- Motivated students enter the classroom prepared to discuss the material.
- Provided equal learning opportunity for students to interact.
- Enriched the classroom (group working).
- Connected students (expand network)
- Allowed students to learn at their own pace.
- Homework in class allowed students help and learn from each other.

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7.3 Organizational level:
-Improved faculty management oversight
-Improved applying business results

8. Do you have any evidence in support of the benefits above...anecdotal or otherwise?

1- METHODS Survey
2- E-Class Survey
3- Monkey Survey
4- The production of over 120 video-clips as a result of use of IT during Fall 2017.

9. What challenges did you face and how did you overcome them?

Challenges (Extending each student learning experience)
- Student comes to class prepared and ready to apply what he/she has learned.
- Convince the student joining practical exercises.
- Routine gets a little bit of time from one student to another getting used to it.

Weakness (Flip classroom - Time concern)
- Not all students have good command of computer practice (Word / Typing).
- Not all students have good command of English (Understanding & Writing)
- Note all students have the same level of engagement, some need more time.

Overcome
Apply technology in a Classroom as a tool that magnifies education towards better life chances and choices for both Lecturer and Student. 50% of average academic students excelled with their academic final grades.

10. What challenges still remain? What would be needed to solve them?

I need to work on further research and modification to the MRM course.

11. In your opinion. What would you say was the most **significant change** for:
    11.1 Teachers?
    11.2 Students?

11.1 Teachers?
General knowledge and competencies.

11.2 Students?
Engagement and commitment

12. Conclusions, lessons learned and recommendations for future developments.

Lessons Learned
- The heart of METHODS strategic planning is gathering as much information about each and every student SWOT
- METHODS teacher is in a good position to supply competitive inelegance.

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- METHODS influence number of qualified students to enroll academically and manifest.
- METHODS don't use tests just to find good students, but also to screen out poor ones.
- All students are qualified candidates, no student can excel without applying METHODS sorts of tools and techniques.

Tips

- Lecture must understand and adapt with students' differences in how they cope with learning.
- Lecturer must apply Research Insight: Students like tests that are FAIR.
- Lecturer must respect the confidentiality of the student results.
- Student have the right to be informed regarding the use of his/her information (marks, pictures, videos etc).

Conclusion

Enhanced the capacity of each student to develop student educational learning skills and equipped them with more tools on how to use technology to its up most benefit and profit. Students know how to deliver and evaluate his/her performance within e-enabled curricula according to educational best practices is employed. To apply technology in a Classroom as a tool that magnifies education towards better life chances and choices for both Lecturer and Student. 50% of average academic students excelled with their academic final grades.

Forecasted Challenge

We need to focus more on practicing METHODS in our classrooms to standardize HRM teaching methods not only locally but regionally, and learn more to know-how to develop insert & adapt business methods into diverse disciplines as such as Nursing, Science, Education and ARTS, Hospitality etc.

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Jordan University of Science & Technology Case Study

CASE STUDY FORMAT
FOR THE METHODS PILOT COURSES THAT WERE RUN IN THE Second (Spring) SEMESTER OF THE ACADEMIC YEAR 2017/2018

Chemical Reaction Engineering -1
Second Semester 2017/2018

Basic Information

Lecturer:	Rowaida Zoumot
Department, School:	Chemical Engineering Department, School of Engineering
Institution/University:	Jordan University of Science and Technology
Course Title:	Chemical Reaction Engineering -1
Course Code/Number:	223320
Discipline/Degree:	Chemical Engineering, B.Sc.
Year:	3rd Year Undergraduate
Compulsory/Elective:	Compulsory
Credit Hours:	3 Credit Hours

1. INTRODUCTION

As part of the METHODS Erasmus+ project, a number of pilot courses (32 courses in total in 8 universities) are being run in the fall and spring of the academic year 2017/2018 (running from September 2017 to May 2018). These pilot courses are meant to allow lecturers to implement the theories and practices that were learnt during the preparatory period. All the lessons learnt from running these pilot courses will inform how future courses are run and would be used in the final report for the METHODS project.

This report describes one of these pilot courses: The Chemical Reaction Engineering -1 course that is being run at the Chemical Engineering Department at the Jordan University of Science and Technology in the Second semester (Spring Semester) of the academic year 2017/2018. The following are the details of the course:

- Course Name: Chemical Reaction Engineering 1
- Course Code: 223320
- Number of Credit Hours: 3 credit hours.
- Time: Sunday, Monday and Tuesday 12:30-13:30
- Lecturer: Rowaida Zoumot
- Department: Chemical Engineering Department
- University: Jordan University of Science and Technology.
- Type of Course: Compulsory Course, 3rd year Undergraduate.

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Hashemite University Case Study

CASE STUDY FORMAT
FOR THE METHODS PILOT COURSES THAT WERE RUN IN THE FIRST (FALL) SEMESTER OF THE ACADEMIC YEAR 2017/2018

Note: This template will be used as the basis for the case studies linked to the courses that were taught in the first semester of the academic year 2017/2018 in the eight partner Universities in Jordan and Palestine. The case will be collected and compiled in the manual of good practice that will be developed as part of the METHODS project. Each of the eight partner Universities in Jordan and Palestine is expected to pick one of its courses to be presented in this case study. It is hoped that the variety of these 8 case studies will provide guidance and ideas for further lecturers in developing their courses in accordance with the METHODS format.

1. Please describe the context and details of your methods course (s)

Lecturer:	Prof. Ahmad Khasawneh
Department, School:	I.T
Institution/University:	The Hashemite University
Course Title:	Computer Skills
Course Code/Number:	110108099
Discipline/Degree:	Discipline , Degree , Degree
Year:	2016-2017
Compulsory/Elective:	Compulsory , Elective , Elective
Credit Hours/ECTS:	3

Also about your university / department and typical students on your courses.

This course is an introductory course to computer systems. It provides students with the required general knowledge and basic skills in computer hardware, operating systems software, application software and internet. It is a compulsory course for all students in the university in all departments.

2. What methods modality did you use and why?

Several activities were leveraged in delivering the course, for instance; online videos, virtual class rooms, quizzes and many other activities that were hosted by moodle VLE

3. What learning and teaching issues or problems does the chosen modality address?
3.1 Learning issues:

Some students do not have the required computer skills to collaborate effectively
Technical problems that are related to power, servers' availability and internet connectivity

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Students' resistance towards this type of learning

3.2 Teaching issues :

Technical problems that are related to power, servers' availability and internet connectivity

4. What did you do and how did you do it?

Lectures were delivered online, virtual office hours were held periodically through moodle chatrooms and social networks, quizzes were conducted periodically to ensure that students keep up with the course.

5. What changes, if any, did you make to the assessment?

Assessment was conducted on regular basis "weekly" through quizzes that covers specific topics

6. What further changes would you make if you could?

Distribute students into small sections with a tutor for each section to facilitate the learning process and help teachers follow up students.
Conduct training workshops that targets the tutors to help them in guiding students activities
Provide teachers with more advanced eLearning technologies

7. What were the benefits of the methods course and the changes made?
7.1 To teachers?

Helps teacher in developing curricula based on well-known standards
Introduce new learning technologies to teachers and help them use it in developing and delivering courses

7.2 To learners?

Introduce new learning experiences to students and allow them practice new forms of learning activities
Help students save time and money

7.3 To the organisation?

On line courses helps organizations to reduce operational costs
The university competes with well-known international universities that deliver courses on line
Helps the university in making professional development for their staff

7. Do you have any evidence in support of the benefits above...anecdotal or otherwise?
http://www.mlms.hu.edu.jo/course/view.php?id=1239

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Najah National University Case Study

CASE STUDY FORMAT
FOR THE METHODS PILOT COURSES THAT WERE RUN IN THE FIRST (FALL) SEMESTER OF THE ACADEMIC YEAR 2017/2018

Note: This template will be used as the basis for the case studies linked to the courses that were taught in the first semester of the academic year 2017/2018 in the eight partner Universities in Jordan and Palestine. The case will be collected and compiled in the manual of good practice that will be developed as part of the METHODS project. Each of the eight partner Universities in Jordan and Palestine is expected to pick one of its courses to be presented in this case study. It is hoped that the variety of these 8 case studies will provide guidance and ideas for further lecturers in developing their courses in accordance with the METHODS format.

Basic Information

Lecturer:	Abdel Karim Daragmeh
Department, School:	English Language and Literature
Institution/University:	An-Najah National University
Course Title:	Survey of British Literature
Course Code/Number:	
Discipline/Degree:	English/ Bsc
Year:	2017/2018
Compulsory/Elective:	Compulsory
Credit Hours/ECTS:	3/4.5

Case Study Contents

1. Please describe the context and details of your methods course (s)

Also about your university / department and typical students on your courses.

The course is third year compulsory for English majors. The course surveys British literature from the eighteenth century to the modern era. The work selections represent the various genres, trends, and movements that dominated the literary scene over this extended period of time. The class discussions will relate the assigned texts to political and social history, so that the works can be read in a more meaningful context. Assignments and exercises will help students develop ideas useful for drafting their class papers. We will also learn new literary terminologies and apply them to the selections.

2. What methods modality did you use and why?

The course uses the problem-based learning strategy to provide learners with self-directed learning opportunities; there are six problem scenarios - two on each historical period - which will help develop learners' critical thinking, team work and soft skills. The course also provides Moodle content, activities and forums to support the face-to-face class discussions. Students are responsible for keeping track of the due dates for the Moodle deliverables and the problem scenario presentations. Once students are ready to deliver their problem analysis, the class shifts to the flipped classroom modality. Then student teams presented their problem definition, problem causality and solution

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scenarios as detected in the course readings and other resources the teachers made available on the Moodle platform.

3. What learning and teaching issues or problems does the chosen modality address?

3.1 Learning issues:

The course modality was meant to improve student skills in extensive reading, data gathering, critical thinking, problem solving, and presentation skills. The students will also demonstrate team work skills.

3.2 Teaching issues

Course preparation and planning took quite a good time. Various kinds of resources like instructional videos, links to internet sources, forum discussions, polling questions were prepared in advance and made available for students on the Moodle platform. The scaffolding happened in such a way that students could access these materials to help address the assigned problem task.

4. What did you do and how did you do it?

The teacher will lead the discussion at the beginning of each chapter; this time was meant to introduce the students to the main themes and concerns in each period. Meanwhile, student teams will be working on problem identification, task division among team members, and presentation planning. They were directed by the teacher to the works they were meant to read, the videos they were meant to watch, and the online links they should access. By the time the teacher finishes the discussion of the major issues - often in one week- the student teams will take over and present their findings on the problem scenario. The presentations took from 1-2 weeks.

5. What changes, if any, did you make to the assessment?

the course assessment scheme changed to accommodate the new work load that was assigned to the students. The problem scenario was given 30% of the total course grade. The 30 points were divided into 15 on the presentation and 15 on individual reporting.

Of course rubrics for assessing the presentations and the reports were prepared and distributed well ahead of time.

6. What further changes would you make if you could?

The most important challenge I met in this course had to do with learner readiness to carry out learning independently. They had to change many learning habits like reliance on the teacher for information, reliance on the teacher for making judgements on the validity, reliability and relevance of their own data. More guidance and coaching was needed to overcome these challenges. When I teach the course again, I will allow for more guidance and team consultation time. Such time would help the students make the transition from old to new habits much more easily.

7. What were the benefits of the methods course and the changes made?

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7.1 To teachers?

The course provided for a rich learning experience; The teacher received training on problem-based learning course design and on developing online learning resources. Not only that but the teacher also implemented these tools within the life time of the project. The implementation helped reinforce the learned skills to a great extent. With a bit of experience, the teacher trained 30 more teachers on these learning modalities.

7.2 To learners?

Some students testimonies would tell much about the new learning opportunities provide to the students. A few students reported that it was their first time in their program residency that they did problem solving.

The teacher could observe the growing confidence in the learners as they made progress in their problem task. Their presentation skills also improved.

7.3 To the organisation?

5 teacher from among the 30 who were trained on problem based learning will be designing courses using this methodology.

8. Do you have any evidence in support of the benefits above...anecdotal or otherwise?

Student forum discussions are well documented on the Moodle platform; a few presentations were tap recorded; Student reports on the problem scenarios were also collected as evidence on the benfits gained from this course design.

9. What challenges did you face and how did you overcome them?

The main challenge had to do with learner readiness and the change in learner habits.

10. What challenges still remain? What would be needed to solve them?

More coaching and guidance is required than I could afford to give in my first experience. I think that was the main challenge that will need to be addressed next time.

11. In your opinion. What would you say was the most significant change for:

11.1 Teachers? Already answered.

11.2 Students? Already answered

12. Conclusions, lessons learned and recommendations for future developments.

The experience was really rich for the students and their teacher. It provided for a worthy opportunity to work on enhancing learner independent learning habits.

My recommendation for future rounds has to do with providing more guidance and coaching. This can be done through arranging for consultations on student work in progress. These consultations will need to be done formally during class sessions and they need to be integrated in the course syllabus. On each milestone, one consultation will be needed. One for problem identification; one on defining and explaining causality; and one on deciding solution scenarios.

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Palestine Polytechnic University Case Study

CASE STUDY FORMAT
FOR THE METHODS PILOT COURSES THAT WERE RUN IN THE FIRST (FALL) SEMESTER OF THE ACADEMIC YEAR 2017/2018

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Basic Information

Lecturer:	Mahmoud H. M. Saheb
Department, School:	College of IT and Computer Engineering
Institution/University:	Palestine Polytechnic University
Course Title:	Database Systems
Course Code/Number:	5368
Discipline/Degree:	IT/CS/CE
Year:	3rd
Compulsory/Elective:	Compulsory
Credit Hours/ECTS:	3

Case Study Contents

13. Please describe the context and details of your methods course (s)
    Also about your university / department and typical students on your courses.

About PPU

Palestine Polytechnic University (PPU) is one of the leading polytechnic universities in Palestine. It was founded in 1978 by the University Graduates Union (UGU), which is a non-profit organization in Hebron district. The primary mission is to emphasize quality vocational and technical engineering education. This is achieved by providing students with practical knowledge to help them acquire an up-to-date experience directly related to their disciplines.

In addition to the two-year diploma degree, PPU has been offering a B.Sc. degree in a number of engineering programs since 1990.

PPU is officially recognized by the Palestinian Ministry of Higher Education and it is an active member in the Rector Conference of Palestinian Universities.

There are about 6000 students enrolled in the various areas of specialization at PPU during the academic year 2013/2014. PPU dedicates particular attention and commitment to enhance its

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relationship with the local community by identifying potential community priorities and needs. To this end, it promotes certain diverse services, strategies and programs to meet these priorities and needs

About the college

The College of Information Technology and Computer Engineering (CITCE) was founded in 2012. The establishment of CITCE came as a needed step towards coping with the vast and fast developments in the information technology (IT) sector and in response to the huge demand for information technology studies. The college offers three programs: IT, CS and CE.

CITCE seeks to be recognized for its ability to graduate information technology professionals and computer engineers who aim at serving the Palestinian community in IT. Depending on its qualified faculty and staff, the college seeks to be one of the national outlets for research and community service.

About the Course

Database Systems is a compulsory course for three programs offered by CITCE. The Objective of this course is to assist the student in understanding the basic theory and concepts of Database Systems, Relational database model, Database Design and Database manipulation Language, and to apply these basic theoretical principles in developing database applications.

The course covers the following topics: Information models and systems; data modeling, relational database model, structured query language; relational database design; entity-relationship (ER) diagrams, ER to relational mapping, relational algebra and SQL, transaction processing concepts, functional dependencies and normalization.

After completing this course student will be able to: -

A- Knowledge and Understanding

A1: Describe fundamental elements of a relational database management system

A2: Explain the basic concepts of relational data model, entity-relationship model, relational database design, normalization, relational algebra and database language SQL

B- Intellectual skills

B1: Design entity-relationship diagrams to represent simple database application scenarios

B2: Convert entity-relationship diagrams into relational tables, populate a relational database and formulate simple SQL queries on the data.

B3: Criticize a database design and improve the design by normalization

C- Professional and Practical skills

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C1: Using Ms Access for simple Tables creation and queries and Oracle SQL-Plus
C2: Write SQL Queries

D- General and Transferable skills
D1: Working with team
D2: Using software tools independently
D3: To create active learners

14. What methods modality did you use and why?

We have used three modalities in this course; Flipped Classes, Project base Learning and Project Based Learning.

Flipped Class: For understanding the problem of using traditional file- based approach, and how these problems can be solved using database approach (Competencies: A1, A2).
Videos and hands-on materials has been developed for all activities;

- Before class activities:
- In class activities:
- After class Activities:

Problem Based Learning: How we can use a systematic approach of decomposing tables to eliminate data redundancy and undesirable characteristics like Insertion,
Update and Deletion Anomalies; the normalization process. (Competencies: B3).

Project Based Learning: For developing simple database application (Competencies:
A2, B, C, D). A mini project using MS-Access has been developed during this course, to attain the related competencies.
Project based Learning (Mini Project) In this course students are required to develop a simple database project. Two to 3 students should work as a team. After completing this project students should be able to:
1- Design a conceptual model for a simple database
2- Normalize (3NF) and create a physical design for a simple database
3- Create database objects including Tables, Indexes, Users, and Integrity and security constraints.
4- Use proper controls for Forms and Reports.
5- Create simple SELECT SQL statements for simple queries.
6- Use MS Access for developing simple application, including Forms and Reports.
Our system is a simple clinic medical records system for keeping the Patient basic information with details on the patient's visits.

15. What learning and teaching issues or problems does the chosen modality address?

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15.1 Learning issues

- Some students did not engaged as expected.
- New skills requires more efforts.

15.2Teaching issues:

- The lack of resources especially the video recording and editing systems added additional difficulties.
- It takes a long time and hard work but eventually, it will have great benefit to students.
- Most of the competencies were achieved as planned. The problem based learning (normalization topic) did not give the expected level.

16. What did you do and how did you do it?

17. What changes, if any, did you make to the assessment?

- More grades where added for students participation.
- More grades where added for quizzes
- Rubric has been developed for the course project, See appendex-2.

18. What further changes would you make if you could?

- Enhance student's engagement.
- Give students more time for discussion.
- Enhance videos quality.

19. What were the benefits of the methods course and the changes made?

19.1 To teachers?

- Teacher can concentrate on content mastery not delivery.
- Recorded videos can be reused.
- Teacher can develop more transparent assessment methods, depending on different activities.

19.2To learners?

- Increase students self-dependence, responsibility, and team work.
- Provide different approaches for the same content.
- Students have more time to ask questions.

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- Students can watch the video any time and many times.

19.3 To the organisation?

- Developed the use of the LMS in the organization.
- Increase, even limited increase, the web-metrics accessibility.

20. Do you have any evidence in support of the benefits above...anecdotal or otherwise?

I think the developed materials can be used for course delivery in the next semesters, enhancements can be added.
The project was successful despite of some limitations.
The impact was clear on the students through their grades compared with previous semesters, their participation in the course activities; watching videos, team work, using Moodle and mobile.
I have changed my teaching methods for a course that I almost teaching it for more than 20 years.

Evidence in support of the benefits:

- Student Digital Habit Survey pre and
- Post course.
- Couse site
- Grades compared with previous semesters
- Project grades: least grade was 14/20
- Class Videos on YouTube:

https://www.youtube.com/watch?v=Ktlfh1rZhz4
https://www.youtube.com/watch?v=ciTRg7JUmuQ
https://www.youtube.com/watch?v=C5xVPGq1Cws
https://www.youtube.com/watch?v=s-JktplaEYQ
https://www.youtube.com/watch?v=gWZsXiBAQV0
https://www.youtube.com/watch?v=u48w_-UM9Sk

21. What challenges did you face and how did you overcome them?

The time estimation for completing the course activities including the new activities and the students participation in these activities was under estimated, new activities and practices take more time for development and for delivery; this fact alter the planed schedule. The content creation and specially the videos was time consuming. Student's engagement, in the early stage, was another problem.

More efforts and more time was spent to develop the new documents, activities and rubrics. The time schedule changed to overcome the delays especially due to the flipped-classes.

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22. What challenges still remain? What would be needed to solve them?

Students engagement in the Flipped-classes, and enhance students outcome from problem bases learning needs some efforts. Early intervention will be used which is important that the teacher knows the extent of understanding of each student, this will be done using Quizzes as part of the home activity.

Some students was not prepared, they do not understand the value of this approach. Giving the content in different approaches may overcome this problem.

23. In your opinion. What would you say was the most significant change for:

23.1Teachers?

PBL and project based learning are not new practice for me, so little has been added for my skills in this regard, especially using rubrics in project evaluation.

Flipped-classes was new for me and found that it could be used in many situations in my courses, especially if we developed videos in previous courses.

Using Rubric for project based learning was a new change for teacher. See appendex-2.

23.2 Students?

For active students, it was anew learning practice, with more independent activities. Using different tools for course delivery; slides, videos, face-to-face, quizzes, and project activities gave students more chances to attain the required competences

24. Conclusions, lessons learned and recommendations for future developments.

- During this course I have learned some new ideas and practices:
- New teaching-learning methodologies may not fit all the student's needs.
- The regular average for student's grades for an activity may increase more than 10% to 20% using flipped classes.
- Using LMS and new modalities will take more efforts than traditional classes.
- Personal videos has more effect than external videos links.

Recommendations:

- Explain the rationale behind using new teaching methodology, especially flipped-classes.
- Develop your own videos.
- Use different technologies and different teaching methodologies to allow freedom to students to choose what they prefer.

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- Give prompt feedback.
- Provide incentives to students' engagement and participation.

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The University of Jordan Case Study

CASE STUDY FORMAT
FOR THE METHODS PILOT COURSES THAT WERE RUN IN THE FIRST (FALL) SEMESTER OF THE ACADEMIC YEAR 2017/2018

Note: This template will be used as the basis for the case studies linked to the courses that were taught in the first semester of the academic year 2017/2018 in the eight partner Universities in Jordan and Palestine. The case will be collected and compiled in the manual of good practice that will be developed as part of the METHODS project. Each of the eight partner Universities in Jordan and Palestine is expected to pick one of its courses to be presented in this case study. It is hoped that the variety of these 8 case studies will provide guidance and ideas for further lecturers in developing their courses in accordance with the METHODS format.

Power Electronics and Drives 0908421
Fall Semester 2017/2018

Basic Information

Lecturer:	Professor Lutfi Al-Sharif
Department, School:	Mechatronics Engineering Department, School of Engineering
Institution/University:	The University of Jordan
Course Title:	Power Electronics and Drives
Course Code/Number:	0908421
Discipline/Degree:	Mechatronics Engineering, B.Sc.
Year:	4th Year Undergraduate
Compulsory/Elective:	Compulsory
Credit Hours/ECTS:	3 Credit Hours/ 6 ECTS

2. INTRODUCTION

As part of the METHODS Erasmus+ project, a number of pilot courses (32 courses in total in 8 universities) are being run in the fall of the academic year 2017/2018 (running from September 2017 to January 2018). These pilot courses are meant to allow lecturers to implement the theories and practices that were learnt during the preparatory period. All the lessons learnt from running these pilot courses will inform how future courses are run and would be used in the final report for the METHODS project.

This report describes one of these pilot courses: The Power Electronics and Drives course that is being run at the Mechatronics Engineering Department at the University of Jordan in the first semester (Fall Semester) of the academic year 2017/2018. The following are the details of the course:

- Course Name: Power Electronics and Drives
- Course Code: 0908421
- Number of Credit Hours: 3 credit hours.
- Time: Mondays and Wednesdays 11:00-12:30

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- Lecturer: Prof. Lutfi Al-Sharif
- Department: Mechatronics Engineering Department
- University: The University of Jordan.
- Type of Course: Compulsory Course, 4th year Undergraduate.

3. PROBLEMS WITH PREVIOUS COURSES

While teaching previous courses at the Mechatronics Engineering Department, I become aware of the following problems with the methods of teaching the courses and the learning outcomes:

1. Students do not retain much of the information that they study in the course. When asked the following semester about some of the point they were supposed to have studied in the course, they do not remember much of the material.

2. Students attend the lecture they are passive observers. They merely listen to the lecture, but are not receptive to what is being given as they have not prepared for the lecture. This becomes more of a problem in the following lectures, as more material is given that is dependent on earlier material.

3. During the lecture, the students appear to understand the concepts that I am presenting. When I explicitly ask them, they confirm that they have understood. But then I actually ask them a specific question, or when I look at their answers in the exam, I realise that they do not in fact understand the concept. What I have assumed is a basic simple concept, turns out to be difficult for them to understand.

4. Because the students do not study the material regularly, they postpone studying to the last one or two days before the mid-term exam or the final exam. This means that they are trying to cram the material in a very short period of time, and do not have sufficient time to understand the material or the basic concept. Some students, under time pressure, often resort to memorising the answers to past exam questions.

These are serious problems that required addressing. It was when I joined the METHODS project that I realised that there is a great opportunity to address some or all of these problems by using modern methods of teaching or lecturing.

4. The Three Pillars of the Change of Methodology

In order to address these problems, the following changes were made to the delivery and assessment methods in this course, as learnt from the METHODS training programme. There were three basic pillars on which the whole new approach was based. These are listed below.

1. *Continuous assessment and feedback :* In order to encourage the students to study weekly, a weekly multiple choice was given to the students. Each of the quizzes comprised

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10 multiple choice problems based around one chapter of the material. The quizzes were marked and given back to student within 5 days and the quiz was solved in class in order to allow students to understand what mistakes they had made. *This solved the problem that students do not study weekly and they only study shortly before the mid term and final exams. This allowed them to better understand the material.*

2. *Flipped Classroom:* The whole material is available online in the form of videos and pdf files. Students would study at home by watching the videos and reading the pdf files. They would then attend class and ask questions about the points that they did not understand from the materials. *This improved the level of interest of the students during class, as they were well prepared prior to coming to class. It also freed up the lecture time so that it can be spent on more creative and interesting activities.*

3. *In class problem based learning:* Students would be given a problem related to the material of the course and they would be asked to solve it in groups and then present the solution at the whiteboard to the whole class. This was done to replace the conventional method of the lecturer speaking in the class for 75 minutes. This allowed students to do something in class, work in groups and solve problems. *This solved the problem of the student being passive observers during the class and allowed them to learn by DOING something in class rather then LISTENING to the lecturer for 50 or 75 minutes.*

5. Other Activities and Assessment

The students were assessed as follows:

1. Weekly Quizzes: Approximately, once a week, a quiz is set and announced to the students in a specific part of the curriculum (e.g., one quiz per chapter).

2. Mid term exam: this is a classical essay written exam, covering around 2/3 of the material. It is usually held in week 10 of the semester.

3. Course project: The students are asked to work in groups and then to pick a project from a list of projects. The students then work on the project and find a suitable solution, prepare a report and a presentation and then present the finding to the class. They are assessed on the following points: technical content, quality and content of the report, their presentation, time keeping in the presentation, questions and answers after the presentation, and teamwork.

4. Problem Based Learning: One assignment was given to the students to solve outside the class. A practical real-life problem was given that can be solved using power electronics. The students were asked to research the problem and propose different solutions and then compare the different solutions listing their advantages and disadvantages. They would also recommend one of the solutions giving reasons.

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5. Final Computerised Exam: The students would bring their laptop loaded with MATLAB/Simulink. The would be asked to build a power electronic circuit, run it and test it and then produce results. This allowed them to improve their design and model building skills.

6. Final written exam: The students would sit a conventional written final essay exam that covers the full material of the course.

In addition, bonus marks were given to students where appropriate when they answer a difficult question or suggest a bright solution to a problem.

4. Lecture Time

Once flipped learning was adopted, this freed up the lecture time to do the following activities:

1. Applications: The lecturer would dedicate around 4 lectures during the course to show videos and photographs of modern applications of power electronics in society today. The videos would be paused regularly during the lecture and discussions carried out, with students commenting or asking questions.

2. In Class Problem Based learning (discussed earlier).

3. Solving the weekly quizzes and discussing them.

4. Guest Speaker, who attend and speak to students about related topics.

5. Writing code and building Simulink Models in Class: Students would bring their laptops in class and solve problems given to them by the lecturer.

5. Hours spent by the lecturer

In addition to asking one of the students to record his hours during this course, I have personally logged my hours upto this point and estimated future hours to the end of the course. The total number of hours spent by me totals around 180 hours for a 3 credit course.

Activity/Item	Details	Hours
Preparing for the lectures	3 x 15	45
Lectures in class	3 x 15	45
In class Quizzes (announced)	8 multiple choice quizzes (10 questions in each quiz) 8 x 5	40
Problem Based Learning Assignment	Preparing the assignment and marking it	3
Mid Term Exam	Preparing the mid term exam	3
	Marking the mid term exam	7
Course Project	Presentations and marking reports	9
Final Computerised (Simulink) Exam	Preparing the computerised exam	4
	Marking the computerised exam	5

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Final written exam	Preparing the final exam	4
	Marking the final exam	15
Total		**180**

6. CHALLENGES AND PROBLEMS FACED

The following list includes a list of typical challenges that could be encountered by lecturers deciding to use the same format:

1. The effort required by the students was perceived to be excessive by some students. Most students had previously being used to simply sitting a mid-term exam and a final exam. Some students decide to take up a part time job to get some extra cash.

2. The number of hours that need to be expended by the lecturer are large compared to the conventional method (see previous section: 180 hours for one course).

3. Availability of Online Material: For this course all the material was available online as You Tube videos and pdf files. The material was very appropriate to the course, as it had already been prepared by the lecturer himself. The same might not be true for other courses and this would present a serious challenge to the feasibility of "flipping" the classroom.

7. CONCLUSIONS AND LESSONS LEARNT

The following conclusions and lessons learnt from this pilot course. The first three are the most important.

1. Students learn much better by doing things themselves. Thus every lecture should have something practical for the students to do.
2. Continuous assessment and feedback to students: it is important to run weekly quizzes to ensure that students study every week and stay up to date.
3. Student who have watched the videos prior to attending lecture, do NOT want to hear the same lecture repeated again in class. They want the lecture time to be used for something more thought provoking and interesting.
4. Student need someone to help them help themselves, by encouraging them to attend class. Taking the register and following up with students is important.
5. Students learn in different styles, and thus it is important to allow them to learn in different ways by offering them a variety of activities and to assess them in different ways (projects; computerised exam; software..)
6. The first 8 weeks of the course should be used for quizzes, as the students are not so busy in the first 8 weeks.
7. Electronic submission on Moodle gives students a sense of urgency and encourages them to submit assignments on time.

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Al-Zaytouna University of Jordan Case Study

CASE STUDY FORMAT
FOR THE METHODS PILOT COURSES THAT WERE RUN IN THE FIRST (FALL) SEMESTER OF THE ACADEMIC YEAR 2017/2018

Note This template will be used as the basis for the case studies for the courses that were taught during the first semester of the academic year 2017/2018 at ZUJ. This case will be collected and compiled in the manual of good practice that will be developed as part of the METHODS project. Each of the eight partner Universities in Jordan and Palestine is expected to pick one of its courses to be presented in this case study. It is hoped that the variety of these othe r8 case studies will provide guidance and ideas for further lecturers in developing their courses in accordance with the METHODS format.

Thermodynamics (1) 0911221
Fall Semester 2017/2018

Basic Information

Lecturer:	Dr. Ahmad Manasah and Eng. Eman Abdelhafez
Department, School:	Mechanical Engineering Department, Faculty of Engineering and Technology
Institution/University:	Al-Zaytoonah University of Jordan
Course Title:	Thermodynamics (1)
Course Code/Number:	0911221
Discipline/Degree:	Mechanical Engineering, B.Sc.
Year:	2nd Year Undergraduate
Compulsory/Elective:	Compulsory
Credit Hours/ECTS:	3 Credit Hours/ 6 ECTS

1. INTRODUCTION

As part of the METHODS Erasmus+ project, a number of pilot courses (4 courses in total in Al-Zaytoonah University of Jordan) are being offered in the fall semester of the academic year 2017/2018 (running from October 2017 to February 2018). These pilot courses are meant to allow lecturers to implement the theories and practices that were learnt during the preparatory period. All the lessons learnt from running these pilot courses will inform how future courses are run and would be used in the final report for the METHODS project.
This report describes one of these pilot courses: Thermodynamics (1) course that is being offered at the Mechanical Engineering Department at the Al-Zaytoonah University of Jordan during the first semester (Fall Semester) of the academic year 2017/2018.

2. PROBLEMS WITH PREVIOUS COURSES

While teaching previous courses at the Mechanical Engineering Department, we become aware of the following problems with the methods of teaching the courses and the learning outcomes:

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5. Students do not retain much of the information that they study in the course. When asked the following semester about some of the point they were supposed to have studied in the course, they do not remember much of the material.
6. Students attend the lecture are passive observers. They merely listen to the lecture, but are not receptive to what is being given as they have not prepared for the lecture. This becomes more of a problem in the following lectures, as more material is given that is dependent on earlier material.
7. Because the students do not study the material regularly, they postpone studying to the last one or two days before the midterm exam or the final exam. This means that they are trying to cram the material in a very short period of time, and do not have sufficient time to understand the material or the basic concept. Some students, under time pressure, often resort to memorising the answers to past exam questions.
8. Students did not expect such a simple, straight forward kind of a question in the exam. That explains why many of them did not attempt to solve it in the first place.
9. Students copy the assignment's from each other's, and didn't take it seriously.

3. TEACHING METHODOLOGY

This course was taught by three instructors and four different time slots. As instructors, we decided to solve the same questions for each chapter to all the students so that all of them have the same notes and materials. However, each instructor had a different way of teaching. For instance, one instructor used the group-study and discussion technique, another incorporated the e-learning portal, and the third followed the traditional way of teaching in class. The reason we did this is to compare between three different methods of teaching as a research study. The preliminary results showed that the average grades for the class which used group-study technique was much better in compare with the other techniques, meaning that the different teaching styles directly affect students' results.
There were three techniques used as mentioned above. The details of each techniques is listed below.

8. *Traditional teaching techniques:* : traditional teaching strategy that relies on explicit teaching through lectures and teacher-led demonstrations. Teachers act as the sole supplier of knowledge, and under the direct instruction model, teachers often utilize systematic, scripted lesson plans. This technique includes exactly what the teacher should say, and activities that students should complete, for every minute of the lesson

9. *Flipped Classroom by using e-learning portal:* The whole material is available online (Methods Moodle) in the form of videos and PowerPoint files. Students would study at home by watching the videos and reading the PowerPoint files. They would then attend class and ask questions about the points that they did not understand from the materials.

10. *In class problem based learning:* Students would be given a problem related to the material of the course at the end of each chapter and they would be asked to solve it in groups and then present the solution at the whiteboard to the whole class. This technique makes students to do something in class, work in groups and solve problems.

4. INSTRUCTIONAL METHODS OF THE COURSE INCLUDE THE FOLLOWING ACTIVITIES:

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Lecture (L):

- Instructor will teach the topics of the course emphasizing on related course specific performance indicators, while students will take notes and read from the textbook.
- Student learning outcomes will be measured by first, second and final exams.
- Instructor will solve the first and second exam in front of students to ensure that learning objectives are met.
- Instructor will give the students sample questions and extra material on the E-learning portal.
- At the end of the semester there will be one major final exam that would cover all the main topics of the course

Tutorial (T):

- During the class, the various problems at different difficulty levels will be solved by the instructor.
- Students will be encouraged to participate in solving the problems. Instructor will guide the students during the class.

5. HOURS SPENT BY THE LECTURER

The following table shows the total number of hours spent by us, totals around 150 hours for a 3 credit course.

Category	Activity	Number	Length	Student Hours	Comment
Scheduled Learning And Teaching Activities	Lecture	40	1:00	40	N/A
Guided Independent Study	Assessment preparation and completion	1	1:00	1:00	1st Test
Guided Independent Study	Assessment preparation and completion	4	0:15	1:00	Quizzes assessments
Guided Independent Study	Assessment preparation and completion	1	1:00	1:00	2nd Test
Guided Independent Study	Assessment preparation and completion	1	2:00	2:00	Final exam
Guided Independent Study	Independent study	1	155:00	105	Reflecting on lecture notes; general reading; solving problems, exam revision.
Total				150:00	

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Total: 150 hours = 5 CP (30 hours = 1 CP = 1 ECTS).

6. CHALLENGES AND PROBLEMS FACED

The following list includes a list of typical challenges that could be encountered by lecturers deciding to use the same format:

1. The effort required by the students was perceived to be excessive by some students. Most students had previously being used to simply sitting a first, a second and a final exam. Some students decide to take up a part time job to get some extra cash.
2. The number of hours that need to be expended by the lecturer are large compared to the conventional method (see previous section: 150 hours for one course).
3. Availability of Online Material: For this course all the material was available online on Methods Moodle website. The material was very appropriate to the course, as it had already been prepared by the author of the textbook.
4. Traditional teacher-centered educational approach engineering students sometimes learn theories that they cannot transfer to real situations, or have experiences that they cannot explain with the knowledge they have already obtained
5. Students also face difficulties in retention of knowledge when traditional teaching method
6. Some students cannot properly build an image of the problem and do not know how to start, therefore they struggle everywhere in solving the problem.

7. CONCLUSIONS AND LESSONS LEARNT

The following conclusions and lessons learnt from this pilot course. The first three are the most important.

g) Students learn much better by doing things themselves. Thus every lecture should have something practical for the students to do.
h) Allowing the students to analyse the solve examples in class and collaborate with each other help them to better understand the concepts of the course.
i) The first month of the course should be used for quizzes and group-solving examples, as the students are not so busy in the first month of the semester.
j) Switch all homework to the e-learning portal and encourage students to engage in open discussions on it.
k) Allocating time to group-solve problems in class with the students. The reason most of students did not solve this assessment correctly was their weak skills especially in using the Thermodynamics tables.
l) Asking students to solve the homework on paper, take a picture of it, and send it to the Moodle site to let students practice solving questions while submitting the homework. Another

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reason is that students do not usually take homework assignments seriously. This technique changed things because they were required to solve and submit before the deadline on the e-learning portal. Copying others' homework was reduced also since the deadline were always Saturday midnight.

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Birzeit University Case Study

CASE STUDY FORMAT
FOR THE METHODS PILOT COURSES THAT WERE RUN IN THE FIRST (FALL) SEMESTER OF THE ACADEMIC YEAR 2017/2018

Note: This template will be used as the basis for the case studies linked to the courses that were taught in the first semester of the academic year 2017/2018 in the eight partner Universities in Jordan and Palestine. The case will be collected and compiled in the manual of good practice that will be developed as part of the METHODS project. Each of the eight partner Universities in Jordan and Palestine is expected to pick one of its courses to be presented in this case study. It is hoped that the variety of these 8 case studies will provide guidance and ideas for further lecturers in developing their courses in accordance with the METHODS format.

Basic Information

Lecturer:	Wasel Ghanem
Department, School:	Faculty of Engineering and Technology
Institution/University:	Birzeit University
Course Title:	Interfacing Techniques
Course Code/Number:	ENCS436
Discipline/Degree:	Computer Engineering/Bsc.
Year:	2017/2018
Compulsory/Elective:	Compulsory
Credit Hours/ECTS:	3/4.5

Case Study Contents

25. Please describe the context and details of your methods course (s)
    Also about your university / department and typical students on your courses.

The course is 4th compulsory for Computer Engineering students. The course discusses modern systems, which consist of mechanical, electrical, electronics and microcomputers. The synergy between these multi- disciplinary systems leads to a modern smart systems like robotics. Modern sensors, actuators, microcomputers will be introduced and these will be used to create a smart system like robot. This course will increase the awareness and understanding of the modern sensors and the related interfacing issues with other systems as introduction to 4rd industrial revolution.
Problem based learning is adopted mainly as a methodology in delivery of the course.

Generic Competences:

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1. Describe the Essence of Interfacing Techniques in Engineering
2. Apply mathematical formulations and framework of Interfacing Techniques and their essential building blocks.
3. Express and apply different sensors in different systems.
4. Apply and integrate knowledge in practice in developing different applications like robotics, etc.
5. Develop research skills and presentation skills in presenting a specific system completely.
   Develop teamwork competences and engineering ethics.

Specific Competences (SCs)

1. An ability to apply knowledge of mathematics, science and engineering.
2. An ability to design and conduct robot system, as well as, analyze and interpret data.
3. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

Please find below detailed description by week the subject/activity description/evaluation criteria for the whole course.

Schedule				
Week	Subject	Activity Description *	Evaluation Criterion	
			Description	%
1	Orientation to the course	Students will be asked to build a simple robot they can use different materials such as corks, toothbrushes, and more to complete their robots	Every group should develop a prototype for a robot and submit it to the portal MethodsX	5
2	Build circuits and discuss the fundamental concepts of analog input and output	In this activity the first part of the robot should be developed: light follower robot without brain	Every group should develop a prototype for a robot to follow light and submit it to the portal MethodsX	5
3	Voltage divider and Wheatstone Bridge	In this activity the groups should develop the eye and the speaker of the robot using bridge and comparators	Every group should develop a an eye and speaker for the robot and submit it to the portal MethodsX	5
4,5	Arduino microcontroller	Practical applications on analog and digital inputs on the controller should	Groups should develop different experiments on Arduino using	5

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		be discussed, i.e. LED control, LDR, potentiometer, push buttom, etc.	different types of sensors (LDR, push bottom, thermistor, etc.) and submit report on MethidsX	
6	Architecture of Data Acquisition System	Apply instrumentation amplifier as basic block for analog signal amplification and discussing its different configuration	Every group should design and analyze an interfacing circuit that converts Vout that was obtained from Wheatstone bridge in the last module into 0 volts in case of dark and 5 volts in case of full light.	5
7	Filter Design	In this activity the students should design different types of passive and active filters i.e.LPF, HPF, BPF, BSF to use them in signal conditioning circuits of the robot	Every group should submit a homework about deigning different types of filter using Pspice and implement them using opamp, R,C	5
8	Microphone Amp Frequency Response	In this activity the students should develop the hearing system of the robot (the mic circuit) and measure the frequency response	The groups should develop the mic system of the robot and test it and submit a report to MethodsX	5
9,10	DC Motors and H – bridge	Different type of motors , i.e DC, stepper, and servo should be characterized and discussed . Different possible driving circuits and applications for each type should be defined	The groups should test different types of DC motors practically and characterize the driving circuits and submit a report to MethodsX (assignment)	5
11	ADC/DAC	In this activity different type of ADCs and DACs should be discussed as basic blocks in any interfacing system.	The students should submit a survey about different types and ADCs and DACs and develop as a case study Arduino microcontroller	5

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		Comparison between them with pros and cons.	(assignment)	
12	Thermal Sensors	Different types of temperature sensors i.e. thermistor, thermocouple, RTD, PTAT with their suitable signal conditioning circuits will be discussed	A design questions on different types of thermal sensors with signal conditioning circuits to be connected to microcontroller should be submitted to the portal	10
13,14	Optical Sensors	Different types of optical sensors i.e. LEDs, IR sensors, laser, photodiodes, photocells, with their suitable signal conditioning circuits will be discussed	A design questions on different types of optical sensors with signal conditioning circuits to be connected to the portal microcontroller should be submitted to the portal	10
15,16	Final Project Discussion	Every group should design a complete functioning robot that can hear, see, talk and walk with all modules developed before and add new features to it like controlling it through the sound of the developer only. A report with website should be submitted	Practical exam for every group on the robot, website, report, feedback and discussion on the forum on MothedsX portal	55

* All activities mentioned above are implemented based on BPL

26. What methods modality did you use and why?

I adopted **problem based learning** as main approach in teaching the course.

The course is divided into 16 weeks. Each week we discuss a topic, where a detailed description for the activities is provided to the students. By the end of the course it is expected every group should

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design a complete functioning robot that can hear, see, talk and walk with all modules developed earlier in the course. Also, it is expected to add new features to solve specific problem like controlling it through the sound of the developer only, tourist guide, to dance on music, etc. A report with website should be submitted on MethodsX platform. Every session the students should go to the lab where they find the basic setup to run their activity. The first 20 minutes, I discuss basic theory of the topic then the students are asked to develop the activity allocated to them in that week. For example week 3 the subject is "Voltage divider and Wheatstone Bridge ". First, the concept is explained to them in 20 minutes, then In this activity the groups should develop the eye and the speaker of the robot using bridge and comparators. All hardware is available to them, where they could test, experiment, and develop the eye and the speaker of the Robot by the end of the week. The lab is open to them, so they could access it anytime to develop their prototype. In order to help students to toggle the problems they face through developing their prototype 2 teaching assistants are available most of the time in the lab to coach them and help them. MethodsX activities, forums, group work, quizzes are frequently used all over the course to assess students.

27. What learning and teaching issues or problems does the chosen modality address?

27.1Learning issues:

It was difficult at the beginning of the course for the students to solve their allocated activity, as PBL is new approach on them since students are passive observers in standard classes. In addition, the students are not familiar to work in teams. So, huge effort is needed from instructor to make groups, manage, evaluate, and coach them.

27.2 Teaching issues

It is time consuming, as course preparation needs a lot of effort. Each class, instructor should provide the basic theory and then coach groups to solve the allocated tasks using the resources available in the lab. Therefore, the instructor should follow up with all groups and meanwhile guide them to the proposed scenario. Another skill is needed rather than just lecturing where students are passive learners. Here in this model the students are active learners, they apply critical thinking, higher order cognitive skills, presentation skills to solve the task allocated to them as a team. Follow up on MethodsX is needed to guide the students on Forums and groups. In addition, on-line quizzes are conducted biweekly to make sure the students on the same group are on the same page and just one or two are doing the whole job.

28. What did you do and how did you do it?

As explained earlier, every week we discuss a topic, where a detailed description for the activities is provided to the students. By the end of the course it is expected every group should design a complete functioning robot that can hear, see, talk and walk with all modules developed earlier in the course. Also, it is expected to add new features to solve specific problem to it like tourist robot, controlling it through the sound of the developer only, to dance on music, etc. A report with website should be

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submitted on MethodsX platform. Every session the students should go to the lab where they find the basic setup to run their activity. The first 20 minutes, I discuss basic theory of the topic then the students are asked to develop the activity allocated to them in that week. For example week 3 the subject is "Voltage divider and Wheatstone Bridge ". First, the concept is explained to them in 20 minutes, then In this activity the groups should develop the eye and the speaker of the robot using bridge and comparators. All hardware is available to them, where they could test, experiment, and develop the eye and the speaker of the Robot by the end of the week. The lab is open to them, so they could access it anytime to develop their prototype. In order to help students to toggle the problems they face through developing their prototype 2 teaching assistants are available most of the time in the lab to coach them and help them. MethodsX activities, forums, group work, quizzes are frequently used all over the course to assess students.

29. What changes, if any, did you make to the assessment?

The whole course assessment is changed as explained earlier. Every module in the course has a detailed assessment criterion. Below is a detailed distribution:

Overall Assessment Criteria	**Method**	**Weight [%]**
	Quizzes on MethodsX: in order to make sure the students are following in the course weekly, as they cannot continue if they missed any module.	10
	Midterm exam to make sure the theory of the course is well understood by each student. Questions mainly asked on modules they developed before in groups to enhance team work and active participation of each student.	15
	Project is the core of course where PBL is applied all over the semester	35
	Final Exam as final outcome for the course where different questions are asked to make sure critical thinking, problem solving skills, etc. are fulfilled and have autonomous active learner.	40

It is noticed the project has a major weight in the course, as PBL is adopted and a lot of effort is needed from the students to manage to solve the problem allocated to them as a team properly.

30. What further changes would you make if you could?

A major challenge is to move the university students in my Faculty and as a whole from teaching to learning. Students should learn to rely on himself or herself in learning process

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and not on teacher as source of knowledge. Therefore, PBL should be promoted in the university as one of the modalities to enhance 21-century skills of the learner and to move toward knowledge based economy. More training and coaching is needed to faculty members and to the students to be familiar to work through teams to solve open-ended problems facing the society. I will work on providing more and more open spaces to students like Maker Spaces and Fab Labs where students have access to them all the time and work together as teams.

31. What were the benefits of the methods course and the changes made?

31.1 To teachers?

The course provided me with huge experience. I practiced PBL through the project, trained many faculty members (more than 80) in both Jordan and Palestine how to utilize PBL in their courses. I learned a lot how to change my role from main source of knowledge and just lecturing while the students are passive listeners to a facilitator where I guide students to solve the problems they are facing in their learning journey and guide them to work in teams.

31.2 To learners?

Most of the students showed a lot of satisfaction from the new approach by applying PBL and going to lab frequently and deal with hardware to solve the problems they face in real life. Good amount of them informed me for the first time they deal with hardware like Arduino and raspberry PI and other sensors and actuators to solve different issues related to Robot design. So, they feel proud by the end if the semester, where each team has his own robot doing specific task and solve certain problem in real life like tourism, agriculture, marketing, etc.

31.3To the organisation?

Problem based learning is adopted in Birzeit university as a modality in teaching and learning. A centre is established in the university to train more faculty members how to adopt PBL as an innovative approach in teaching and learning. Faculty of Engineering and Technology will adopt this approach as main methodology in teaching and learning, so more than 10 courses will be developed within this year.

32. Do you have any evidence in support of the benefits above...anecdotal or otherwise?

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MethodsX as a platform where students share discussions, forums, group work, etc. A lot of recordings for students in the lab while working on their projects and the satisfaction they showed while interviewing them.

33. What challenges did you face and how did you overcome them?

The main challenges can be summarized as:

- More open spaces/labs are needed to students to allow them work in groups and develop their prototype.
- Support students to work in teams from different cultural backgrounds, to trust each other and not to compete each other in the same team.
- At least 2 teaching assistants are needed to help the facilitator to coach the teams and help them solve the problems they face while working on their problem.
- Some students face huge challenges when moving from teaching to learning, as they are familiar with the classic approach as passive listeners and excellent in memorizing the information provided by the instructor.

  To solve the above challenges, more courses should be provided to students using PBL by training more teachers. Spaces that are open around the clock should be provided to students as well as teaching assistants with the professors to help them in coaching the students.

34. What challenges still remain? What would be needed to solve them?

Training of more faculty members to live this new experience as well as open spaces to students to mange to work freely anytime.

As mentioned earlier teaching and learning unit should be established in the university to provide further coaching to faculty as well as students.

35. In your opinion. What would you say was the most significant change for:

35.1Teachers? Please see above.

35.2 Students? Please see above.

36. Conclusions, lessons learned and recommendations for future developments.

The experience was very rich and unique. Below are the following main lessons learned and recommendations :

- Follow up with students on weekly basis and provide them with coaching and guidance needed.

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- Support students in identifying the problem they should solve and how to handle it effectively as a team.
- Team work culture by identifying the role of each member in the team and his/her responsibilities.
- Continuous assessment and feedback from students by encouraging them to participate in Forums, discussion groups, quizzes, etc.
- Provide more open spaces to students around the clock.
- Training more faculty members to adopt PBL as one of the modalities in teaching and learning in our universities.
- Engage private sector to help students in identifying and following up in the problem to let the students live real life problems and how they could provide a suggested solution based on context and challenges of the problem.

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Appendix B: Accompanying Research into Problem Based Learning Jordan and Palestine

(Rikke Magnusson, Aalborg University)

BACKGROUND

The guidelines in this manual are based on studies containing observations of developed courses and interviews conducted with students and faculty members at universities in Jordan and Palestine September 2016 – December 2017. The overall developed process has followed a three step plan for development of local materials and local ICT centres in Jordan and Palestine (figure 1).

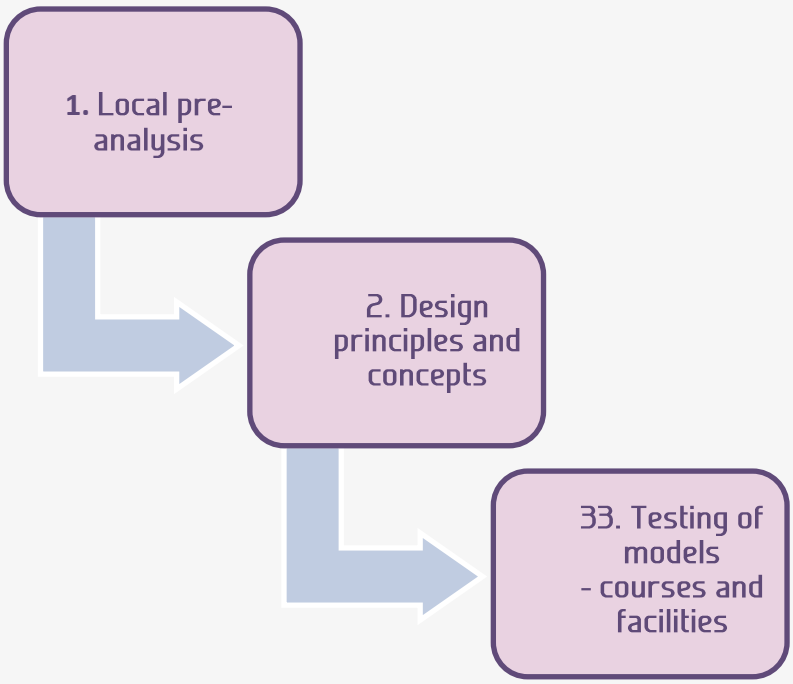

Figure 1: 3-step plan for development of local materials and center

1. PRE-ANALYSIS

- ✓ Analyse context, content and background for learning design
- ✓ Development of selection criteria for participants

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- ✓ Focus groups/workshops with selected teachers, students etc.

2. DESIGN PRINCIPLES AND CONCEPTS

- ✓ Development of Design principles and concepts for courses and facilities.

3. TESTING AND DEVELOPING FINAL COURSES

- ✓ Testing (pilot) courses and facilities

The outcomes of the pre-test are an analysis of the context that is used to make informed design principles and develop courses. These inputs should help facilitate the progress towards establishment of the learning centres and the design of teaching materials.

2.1 Pre-analysis: Analysing context for implementing new teaching forms

The pre-analysis of the context for implementing was conducted from September - November 2016. It consisted of 12 focus group interviews and 4 workshops conducted at local partner universities in both Jordan and Palestine. Thereby these inputs are paramount to the modernization process that the project wishes to initiate. The data collection was done on behalf of Associate professor Rikke Magnussen and by the two student interns, Mette Ruby and Villads Hamann from Aalborg University in Copenhagen..

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2.11 Focus group interviews

- **Focus group interviews:** focus on understanding potentials and challenges for ICT and problem based learning (PBL) education in the context of Jordanian and Palestinian universities
- **Participants:** Max 15 students or faculty members at each activity (separated), participants from all partner universities
- **Co-design workshops:** : focus on understanding faculty members and students' visions for ICT PBL-center, facilities and training
- **Methods**: Un-structured qualitative interviews, video observations, word cards, brain storms, rapid prototypes
- **Analysis**: Thematic analysis (Braun & Clarke, 2006).

*Picture SEQ Picture_ * ARABIC 3: Student participants from the workshops at Bierzeit University, Palestine*

Selection criteria for faculty members:

- Cross-disciplinary: Science, engineering, humanities
- Both ICT users and non-users to represent both groups at the university
- 50 – 50% women and men

*Picture SEQ Picture_ * ARABIC 4: Faculty members participants, from the focus group interview using word cards*

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- Instructors should participate by choice/invitation – motivation is important
- Level of instructors: Assistant professor and above
- It is preferred that the instructors have no more than five years of teaching experience

Selection criteria for students:

- Same + Level of students: graduate and fourth year undergraduate students. To ensure sufficient experience with the educational approach at the university

Interview setting

The focus group interview was one of the primary tasks in collecting data and was structured around the following three headlines, that was divided into two sections, one with faculty members and one with students in universities in Jordan and Palestine. The time spent on each interview was one and a half hour. Word cards was also used as a launch pad of the interview. There were 5 word cards: Time, money ICT, collaboration, occupation. The focus group interview questions were divided into seven themes, that is listed below:

- Utilization of ICT on a daily basis
- Technical challenges with using ICT in a learning context
- Human challenges with using ICT in a learning context
- Components in the culture in general (where the PBL approach could be a problem)
- Utilization of ICT in a learning context
- Components in the learning culture (where the PBL approach could be a problem)

*Picture SEQ Picture_ * ARABIC 5: The focus group interview, while using the word cards*

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- Collaboration and the use of ICT

2.2 Results

This section will provide results and discussions that have been obtained, based on the data collection that is described above, made in Jordan and Palestine universities with the participants, faculty members and students. A result description and statements which was expressed by the participants.

Themes	Sub-themes
1. Access	1.Hardware, internet, physical access
2. Places for group work	1.Physical and virtual space
3. Roles in students and teacher use of ICT	1.Pen & paper vs. pc, blackboard vs pp 2.ICT freedom fighters
4. Group – Project work	1.Trust, dependency, responsibility, gender and culture
5. Collaboration	1.With companies, between universities
6. Technical training	Lack of technical training

Table 2: An overview of the data and preliminary results from data collection

2.21 Access/lack of: Access to laptops, access to internet, physical access:

Lack of access to laptops:

Not common for students to have their own laptop. If students have a laptop they often don't bring it to the university, siblings may need it or due to transportation issue.

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- *"We are 12 people in the home. When I want to use my laptop, my tablet, I have to wait my turn"*

Lack of access to the internet

The Wi-Fi is not always working, is weak or students don't have access

- *"We are 12.000 students on campus, if everybody takes up their phone the signal becomes weak"*
- *"As faculty member we do have access, but the students don't. I was surprised with that"*

Physical access to university and facilities and lack of infrastructure

University closes early - 5pm.

- *"Access of campus, this is the problem a lot (S)*
- *"The lack of infrastructure, like in classrooms at least. We don't have decent Data shows, not all classrooms has computers, the sound system sucks, and certain software are lacking."*

2.22 Places

The occupation and cultural factors in Palestine make it difficult to find physical meeting places

- "It's difficult to bring someone from Hebron at that time, checkpoints 5 pm"
- "Sometimes they (Israel) close the roads so we can't go (to the university)" Student from BU,
- "Last year, because of the intifada .... Those that come from Jerusalem could not reach the campus safely." - Student from BU
- "No problems meeting at home, but it is difficult for student alone to go to other places"
- "In the social media, we meet with groups at home"

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2.23 Roles in student and teacher use of ICT: Pen, paper & blackboard vs. Laptops, WIFI and pp

Serious students use pen & paper

You are seen as a more serious student when you use pen and paper in your studies, expressed faculty members. Students might log-on Facebook and don't pay attention to the lecture.

- *"On the laptop you don't feel like you are studying" (S)*
- *"When I use pen and paper I feel like I study seriously""I agree with that" (faculty member on same issue)*
- *"Professors starts lectures by turning off WIFI"*

Blackboards as more effective - preserving traditional roles

Teaching on blackboards are more effective expressed by faculty members

Blackboard - traditional way of teaching expressed by Students

- *"Teacher prefer the old way of teaching with a board where we are the students and listeners"*
- *"The traditional way with blackboard is more effective even more interactive"*

Academic freedom in terms of methods

Teachers at some departments are limited to what technologies they use.

- *"2007 I started using Power point and the Dean called me, and told me to stop or he would punish me... "*
- *"it's not allowed, open books exams are not allowed"*

Academic freedom fighters - ict methods

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Teachers and students at some departments are limited in terms of choosing teaching methods and access to resources.

- *"...and the only access to journals for example you need to be in the campus premises"*
- *"We are fighters for academic freedom (related to teaching methods)"*

2.24 Group/project work: Trust, dependency, responsibility, boys/girls, culture

Lack of experience in working in groups/trust & responsibility

At university level students do not learn to work in groups before 3rd year. Students have issues regarding trust, responsibility, and dependency in relation to working in groups, which is expressed below:

- *"...In the school, we didn't learn to work as a group, but in the university (ed.: we have to work in groups) but it is difficult. We come from different places and it's difficult to understand each other" "It was a shock" (S)*
-
- *"We have not to trust others and do the work by ourselves." "If you want to make a good project you cannot depend on them. You have to do the extra work to get a good mark"*
-
- *"We work together. Each guy makes a piece of the project and then collect all the pieces to make a project".*

Gender and culture

The interviewed female expressed issues in relation to doing group with the opposite sex: culture, Facebook, relations

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- *"Boys just sit and watch" "Boys have work after school. Some boys want to sit in the cafeteria"*
- *"For me I don't prefer to work with boys. I don't want to talk with them on Facebook. Therefore I prefer to work with another girl.*
- *"Because of my culture I have to have a relationship to the people I work with, therefore I prefer to work with girls"*

2.25 Collaboration: Between students and between universities

Collaboration between students

Students see collaboration as important, they say:

- *"I think collaboration is very important, collaboration in our team, that can add, (…) you can provide different ideas with the problem. You can mix the majors from the kind of your team"*

Collaboration between students is not working because of lack of experience from public schools:

- *"I want to say that collaboration is absent from our course (…) from our schools (…) And when you come to the university and work in groups, collaborate, most of the students, all of them will miss out the deadline (…) they will be careless because they did not get used to it - collaboration ". (SJ)*

Collaboration between Universities in Palestine (and Jordan?) (faculty members)

Respondents expressed that collaboration between universities in Palestine is weak

- *"Internal collaboration in Palestine is very weak"*
- *"Collaboration between Palestinian universities is still very weak. I think there is a competition between universities sometimes more than collaboration"*

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Collaboration with companies

- Collaboration between students and companies is not common
  - "...We don't have this cooperate contribution like the Silicon Valley"
  - "(we need) Collaboration with companies in order to adopt our courses to fit the society"
  - "Collaboration has to be a win-win situation"

Jobs

Finding occupation after university is an important issue for students. They relate it to having the right skills - not only studies

- *"You know, we all seek for a good job, but not all of us get it",*
- *"Can I add? Like when I think of occupation I think of the bunch of skills I need to have. "*
- *"It is about having the skills that qualifies and not only necessarily studies only", "It is not about getting paid or not, it is about having the skills that qualifies and not only necessarily studies only."*
- *"Maybe, especially for our society you end up in a major... ... and you are stuck whit that for the rest of your life. You will never find peace of mind Because you are expected to either be a doctor or engineer"*

2.26 Technical training

Respondents faculty members express that they lack technical training in learning technology.

- Mentioned skills: design video, presentations etc.
- *"Training is important. We have access to equipment"*

Faculty members: Training should involve both pure technical training (Moodle, pp etc.) and how to integrate ICT in education

- *"I think it's good with research about this, how faculty members they see the technology in education, because mostly, **they think it's a technique like a technical issue, how to use Moodle, but we don't think a lot about how to***

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***employ it the capability for technology in the education**, (...) so the training, the training should be, not only about how to convert the materials into digital, how to...(a): to use it... "*

2.3 Conclusions and recommendations: recommended design principles for designing new types of ICT enabled educations and centres

After a thorough pre-analysis, through the focus group interviews and the workshops the next step of the **3-step plan for development of local materials and learning center in Jordan and Palestine** was conducted and presented, the design principles and concepts. The design principles are based on the results from the data collection, as listed below:

1. Access and focus on role of ICT in education
2. Group work and places
3. Collaboration and students' innovation
4. Technical training

In the next section below, the 4 developed design principles will be elaborated. Every design principle is described on each section, which also will be the basis for the design suggestions for courses and facilities in Jordan and Palestine territory.

2.31 Design principle 1: Access and focus on role of ICT in education

Centeres should provide access to WI-FI, equipment and facilities and open spacesfor student group work

- Centers should facilitate access to equipment (laptops), facilities (University buildings after hours), Wi-Fi (solve problems with weak signal) for both students and faculty members.
- Training should take outset in creating courses where students have free access to Wi-Fi and laptops as part of the learning activities.

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Physical and online group work and learning spaces

- Centers should facilitate and make space for both physical and online student group work to overcome physical barriers for meeting.
- E.g. establish physical and digital group rooms.

2.32 Design principle 2: Role of ICT in education and strengthening group work

Educations should focus on role of ICT in education

- Training should include focus on faculty member and students understanding of the role of ICT and student/teacher responsibilities in education.

Group work

- Training should focus at training faculty members in strengthening student group members responsibility for common collaboration tasks in group work.
- Focus at difference between professional and private relations?

2.33 Design principles 3: Collaboration and student innovation

Collaboration between universities

- ICT learning centers should be designed to strengthen collaboration between universities.

Collaboration with companies and student innovation

- Training should involve collaboration with companies and training in involving companies in teaching, definition of tasks and student project work.
- Training should focus on course structures and educational approaches that allow students development of new ideas and change of tasks without changing learning goals.

2.34 Design principles 4: technical training

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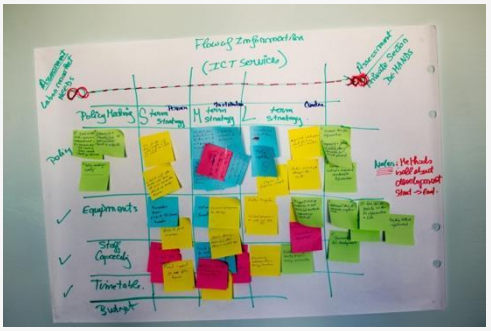
Respondents faculty members express that they lack technical training in learning technology.

- The training should include technical training in educational ICT tools.
- Mentioned skills: design video, presentations, using Moodle etc.
- The facilities should include technical equipment to support technical training.



*Picture SEQ Picture_ * ARABIC 12: Table abut the suggested ICT-services, made by the participants*

The above design principles should work as guidelines in future designs of ICT enabled courses with the three modalities: 1. PBL, 2. Flipped Classrooms, and 3. MOOCs in a Jordanian or Palestinian context.

21st century learning skills

- Learning and innovation skills: critical thinking and problem solving, communications and collaboration, creativity and innovation
- Digital literacy skills: information literacy, media literacy, Information and communication technologies (ICT) literacy
- Career and life skills: flexibility and adaptability, initiative and self-direction, social and cross-cultural interaction, productivity and accountability

DISCLAIMER: This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Section 8: 2. Suggestions for course structure

Two types of faculty member training:

1. **Technical** training
    1. In METHODS ICT learning centers

2. Training faculty members for developing their existing course for students with focus on:
    1. Free digital and physical **access** to learning and facilities
    2. **Collaboration** with companies/organisations/partners outside university
    3. Strengthening **student team work**
    4. Controlling tasks to **develop new ideas**
    5. **Inspiration**

ERASMUS+ Programme – METHODS Project number: 561940-EPP-1-2015-1-JO-EPPKA2-CBHE-JP

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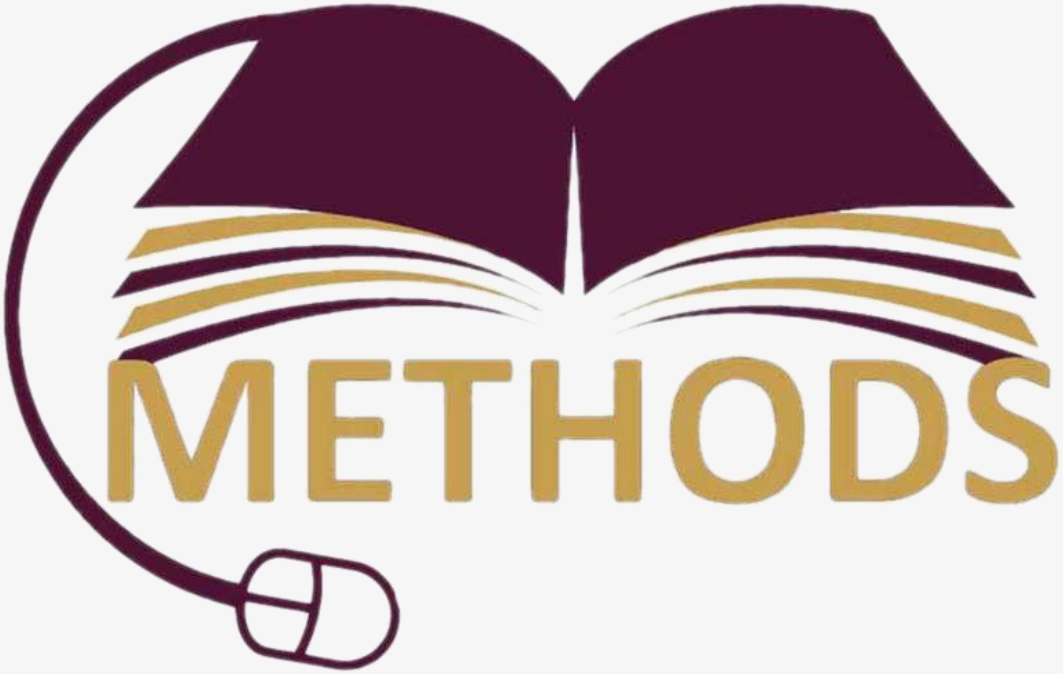

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