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Joint Faculty Approach to Active Learning in Master Classes of Food Technology and Engineering

Massimo Poletto*, Donatella Albanese, Stefano Cardea, Francesco Donsì, Francesco Marra, Michele Miccio, Gianpiero Pataro

Dipartimento di Ingegneria Industriale, Universitá Degli Studi di Salerno, Via Giovanni Paolo II 132, Fisciano SA, I-84084, Italy

mpoletto@unisa.it

A cooperative approach in the faculty members of the Department of Industrial Engineering at the University of Salerno (Italy) was adopted to produce valuable documentation and material for applications of active learning methodology in the master course in Food Processing and Innovation developed within the FOODI project, an Erasmus+ project financed in 2018 in the action KA2 – Cooperation for innovation and the exchange of good practices – Capacity Building in the field of Higher Education. A dedicated form was developed as a key tool in both recording the teaching/learning needs and transferring the work results in terms of examples and activities. Web seminars were provided to illustrate the examples.

1. Introduction

During the past decades there has been a major move from a teacher-centered lecture environment to a student-centered learning environment in engineering education (Fink, 1999; Wayne Bequette et al., 2000; Ghidoni et al., 2019). Engagement of students with the so called "active learning" approach includes the involvement in the teaching process of critical thinking, discussion with the lecturer and peers, observation experience as well as learning by doing with "hands-on" activities (Fink, 1999). The effectiveness of active learning in STEM (Science, Technology, Engineering, Math) disciplines has been debated since long (Prince, 2004), but several experiences indicate a certain increase in the student interest (von Blottnitz, 2006) and motivation in courses adopting class interaction (Liberatore, 2013), multiple engagement methods (Rodríguez et al., 2019) and web-based technologies (Koretsky and Brooks, 2012). A number of proofs of the efficacy of active learning can be found elsewhere (Froyd, 2008). The number of methods and tools available to engage students is wide and requires an experimental approach based on the instructor evaluation. In this respect, a cooperative approach among Faculty/Department members based on peer observation principles turned out useful to overcome difficulties and provided a faster spread of successful solutions (Ghidoni et al., 2019). This paper reports on a group experience carried out at the University of Salerno (Italy) in the development of support material for active learning in a new master course in Food Processing and Innovation developed within an Erasmus+ project (FOODI, 2019), to be deployed in three southeast Asian countries (i.e., Cambodia,

2. The Foodi project

Malaysia and Thailand).

FOODI (MSc course in Food Processing and Innovation) is an Erasmus+ project financed in 2018 in the frame of the action KA2 – Cooperation for innovation and the exchange of good practices – Capacity Building in the field of Higher Education. One of the main project aims is the development of a Master Course in Food technology and food processing, with special attention to the development of innovation and entrepreneurial skills in the attending students. The developed master course is to be deployed in Malaysia, Cambodia, and Thailand. The leading institution is the Universiti Teknologi Malaysia-UTM. Institutions from three different European countries (i.e., Greece, Ireland and Italy) are involved in the project to help the course design and to

generate material, lectures and online courses for training of southeast Asian instructors. The complete list of the institutions involved in the project is reported in Table 1.

Table 1 Institutions involved in the FOODI project

Organisation	Country	Area
Universiti Teknologi Malaysia-UTM	Malaysia	Business
University of Malaya	Malaysia	Physics
Universiti Teknologi Mara (UITM)	Malaysia	Agrotech., Business, Statistics, Chemistry, Islamic studies
Universiti Kuala Lumpur (UNIKL)	Malaysia	Food technology
University of Heng Samrin	Cambodia	Agronomy
Thbongkhmum		
University of Battambang	Cambodia	Human Sciences, Agronomy
Svay Rieng University	Cambodia	Agricultural Economics
Institute of Technology of Cambodia	Cambodia	Electrical engineering, Chemical and Food Engineering
Ministry of Education	Cambodia	Education
Asian Institute of Technology	Thailand	Food technology
Prince of Songkla University	Thailand	Food technology
University of The Aegean	Greece	Business
University College Dublin	Ireland	Food technology
University of Salerno	Italy	Food Engineering
Research Innovation and Development	Greece	ICT
Lab Pc		
Metropolitan College Sa	Greece	ICT

The project, articulated in 7 work packages, encompasses the complete process of set up of a master-level course, including definition of the learning outcomes (WP1), design of the project master course (WP2), training of instructors (WP3), deployment of the course (WP4), quality assurance (WP5), dissemination of the project outcomes (WP6) according to the call objectives, and the project Management (WP7).

Most of the master course design was developed during two study visits carried out by southeast Asian Project lecturer and staff representatives in September 2019 and in November 2019 at the University College Dublin in Ireland and at the University of Salerno (UNISA) in Italy, respectively. The structure of the course designed is described elsewhere in detail (FOODI, 2019). Briefly, it consists of 90 EC credits, deployed in 3 semesters. Most of the learning outcomes are provided in 7 compulsory modules of 6 EC delivering fundamental and applied knowledge, which are complemented by 3 optional modules of 6 EC chosen out of a list of 6. The program also includes a 30-EC module called MIDAS deployed along the whole 3 semester period, mostly aiming at the development of transversal skills. MIDAS stands for 'Mastering Innovative and Disruptive Approaches for Success', is designed to foster creative confidence as well as an innovative and entrepreneurial mindset in the students and includes an industry-linked Action Research Project culminating in a presentation of projects at a FOODI Conference with the host industries.

In the project management, it was decided that UNISA would have been in charge of guiding the design and producing the material related to the teaching modules of 1) Research & Investigative Processes, 2) Food Process Design, 3) Processing Effects on Structural & Functional Components of Foods, 4) Food Supply Chain, Traceability & Sustainability, 5) Food Packaging, 6) Halal Regulation & Certification.

During the study visit at the University of Salerno, the active learning approach was discussed among the partners, also with the support of the lecture given by prof. M. Barolo of the University of Padua (Italy) on the adoption of active learning techniques in University courses after the experience gained in Padua (Ghidoni et al., 2019).

The process of producing materials for *training of trainers* was also in charge of UNISA. To this end, a working group was constituted at UNISA by gathering the authors of this paper, on a volunteering basis. The working group established a procedural methodology aimed at matching source information coming from the southeast Asian partners with thinking and developing work, thus generating suitable materials and agreeable products to be returned to the southeast Asian partners as beneficiaries. The procedure is schematized in Figure 1.

As a first step of such a procedural methodology, an initial survey was carried out by the working group at UNISA to identify the training needs of the Asian partners. This survey revealed that most of the Asian partners were strongly interested in receiving formation and materials in "active learning".

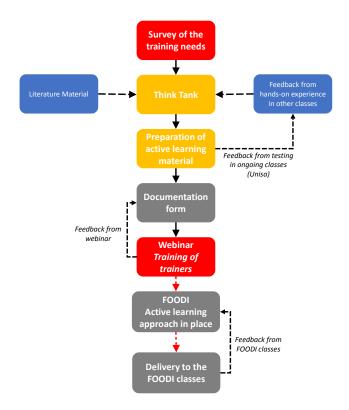


Figure 1. Block diagram of the procedure set up for producing and delivering active learning in FOODI.

Therefore, it was decided that all three European institutions would have moved their focus and produced an effort in this direction, each institution with a particular attention to the courses assigned in the design step of the project. As a second step, the UNISA team started a "think tank" phase about the generation process of materials and examples of active learning, to be applied to specific lectures of the above-mentioned courses, on the basis of literature data and the feedback from hands-on experience in other classes (both in presence and online).

3. A documentation tool

As a third step, the UNISA team developed the active learning material, combining the literature material available mainly in the field of Engineering (Felder and Brent, 2003; Prince and Felder, 2006; Baeten et al., 2010; Mason et al., 2013; Daly et al., 2014; Wang and Tahir, 2020) with the hands-on experience developed in the classes taught by the volunteering lecturers of the University of Salerno. The process was further strengthened by the ongoing Covid-19 pandemics, which caused most of the University classes in spring and fall semesters of 2020 to be taught online. Therefore, the volunteers participating in the development of the active learning material had the chance to directly test the proposed approach in the difficult environment of the online classes, especially for what concerns student engagement. As a matter of fact, one of the most critical issues deriving from the shift from in-presence to online teaching was avoiding to turn the lectures in Powerpoint shows and failing to provide variety in instruction (Felder and Brent, 2021). However, active learning in physically distanced classrooms still remains a formidable challenge (Bruff, 2020), which required considerable efforts in introducing novel tools, for example, for live polling (Wang and Tahir, 2020), collaborative notetaking and group work. Therefore, the most recent tools for online teaching were also revised.

The most important aspect in designing the active learning material, however, was considered to correctly identify the learning outcomes of the lecture and the teaching challenges, and based on those, to use the most adequate approach to pursue them. The most frequently-identified teaching challenges, especially with reference to the topic of the lectures, were: (1) Effective understanding of the concepts of the lecture; (2) Ability to identify the main criteria used to select a specific food transformation process, also in comparison with conventional processes; (3) Ability to evaluate the energy and mass flow rates involved in food processes; (4) Ability to think critically and be able to select the appropriate non-thermal process for a particular manufacturing process; (5) Enhancing the participation of the students during the lecture; (6)

	DESCRIPTION OF T	THE ACTIVE LEARNING ACT	TIVITY
	Number (in time order):		
•	Expected duration of the activity (minutes)		
23	Collocation of the activity in the lecture:		
foodi Co-funded by the Erasmus Programme of the European Union	(Clarify the collocation of the activity in the lea	cture connecting it to the s	pecific lecture content)
*********	Teaching challenges addressed:		
ACTIVE LEARNING DOCUMENTATION FORM	(Link the teaching activity with the specific tea	iching challenge(s) identifi	ed above)
DESCRIPTION OF THE UNIT			
Init type (lecture, workshop):	Kind of active learning activities adopted (cho	oose at least one):	
Init title:	Check of background knowledge		
xpected unit duration (hours)*	First approach to a new subject		
ummary of lecture contents	Learn by doing		
Make a list or a short description of the lecture contents)	Assessment of learning		
	Assessment for learning		
	Development of a case study		
	Strategy:		
	(Explain the strategy adopted to overcome the	s concific teaching chaffens	no/ell
Teaching challenges of the unit	Method (choose at least one):		
dentify the main teaching challenges of the lecture that deserve alternative teaching)	Involvement	Graded	Not graded
	Individual home assignment		
	Individual work in classroom		
	Collaborative home assignment		
	Collaborative work in classroom		
nd of active learning activities adopted (chose as many as necessary)	Description of the activity:		
heck of background knowledge	(Describe the activity also using examples of m	naterial provided (tests, qu	estions)
irst approach to a new subject			
earn by doing			
ssessment of learning			
issessment for learning			
Development of a case study			
ly no means, this number is intended to be prescriptive, but it is intended as an indication to understand			
e lecture contents			
he next table should be repeated for each of the active learning activity designed for the lecture)	Attachments & links		
	(List any material or link that can help the und	lerstanding of the activity)	
a)			

Figure 2. FOODI active learning documentation form.

Keeping the attention of audience high; (7) Making audience aware of the critical review importance. Six main types of the most common active learning modes were used, namely: 1) Check of background knowledge; 2) First approach to a new subject; 3) Learn by doing; 4) Assessment of learning; 5) Assessment for learning; 6) Development of a case study.

The process described in Figure 1 was documented through a dedicated form, set up after collecting inputs from the different partners and staff members and designed to describe the proposed activities to the instructors of the Asian partners in an orderly and effective way. Figure 2 illustrates the form used, which consists of two main sections. The first section is dedicated to the description of the lecture intended as a module unit developing a whole topic. Each of the units was intended to last from one to a few hours. The objective of the section is to highlight the design approach in the adoption of specific learning activity. Therefore, beside the lecture contents, it includes the expected learning outcome of the lectures and the clearly identified challenges in the teaching process. The form also includes a summary of the kind of teaching approaches adopted to overcome or mitigate the difficulties foreseen for the teaching process. The second part of the form is in a tabular form and describes the active learning tasks, with as many tables as learning activities envisaged for the lecture under consideration. The table has to be filled by clarifying, first, in which part of the lecture the reported activity is placed, and then explaining its motivation by identifying the specific teaching challenges addressed, finally the kind of the learning activity adopted. Next, the strategy adopted to overcome the faced challenges is documented and, afterwards, the description of the activity conceived is detailed. In the table it is also required to specify if the student involvement is individual or collaborative, if class and/or home student activity is required and if it is used for grading. The table also includes a space to add eventual references to the educational resources used.

4. The operating method and the current results

As a fourth step, the UNISA team decided to effectively develop materials for the assigned modules (as specified in Section 2) using a distributed, but cooperative approach. Hence, the task to produce a draft of the active learning activities for a given module was attributed to one or two staff members of the UNISA group. The whole group met in weekly meetings of 1—2 hours in which some activity proposals were cooperatively discussed and possibly amended. Sometimes the activity proposals were discussed twice in order to reach consensus. The work for such a step lasted a whole semester, during which a total of 54 proposed learning activities were developed in 84 lecture hours for 14 units in the 6 teaching modules (as specified in Section 2). An example of "filled" form for active learning tasks linked to a given lecture is reported in Figure 3.

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Condi		Co-funded by the		ACTIVE LEARNING ACTIVITY		ACTIVE LEARNING ACTIVITY		
foodi	ef the	mus+ Programme e European Union	Number (in time order) Expected duration of the activity (minutes)	1 10 min	Number (in time order) Expected duration of the activity (minutes)	2 20 min		
ERASMUS. CORE			Collocation of the activity (minutes)	1 10 min	Collocation of the activity	20 min		
1			The activity is collocated at the beginning of the le	cture, before giving the introduction and definition	on of The activity is collocated immediately after giving to		eparation and introducing	
	OCUMENTATION FO	DRM	membrane separation processes.		the main types of membranes and their technical f	features.		
DESCRIPTION OF THE LECTURE Course title Food Process Design			Teaching challenge addressed			Teaching challenge addressed 2. Identification of the main criteria used to select a membrane, also with respect to other		
				e separation, of the semi-permeability of membra	anes. separation processes.	separation processes.		
Expected duration (hours)* 6			of how the membrane separation process	es relate to other separation processes.	Keeping high the interest for the lecture to	opics		
Summary of lecture contents			Keeping high the interest for the lecture t	opics	Kind of active learning activities adopted (choose	one)		
VI. Separation Processes 1. Membrane separation such as MF, UF, RC	NF FD		Kind of active learning activities adopted (choose	one)	Check of background knowledge	T		
Introduction. Definitions. Recovery and separation		sis. Mass fluxes in porous	Check of background knowledge	Check of background knowledge		×		
membranes. Mass fluxes in non-porous membran	es. Concentration polariza	tion. Fouling. Food	First approach to a new subject	×	Assessment of learning Development of a case study			
applications.			Assessment of learning Development of a case study		Strategy			
Learning outcomes of the lecture To understand the principles and applications of the			Strategy		Discussion is stimulated among students about the	e advantages and disadvantag	ges of membrane	
to understand the principles and applications of t	ne major Jood engineering	unit operations and their	Discussion is stimulated among students about th			ocess is assigned to focus the	panel discussion in	
Teaching challenges of the lecture			especially in comparison with filters, sieves and or		comparison with other existing processes. The lecturer participates in the different panels, tr	non to she remarking if non-	dad and collection now	
 Introduction of the concepts of membrar 	e senaration of the semi-	nermeability of membranes	This is done showing to the students different pic do not depict a membrane, but which leads towa	tures, some of them provocative because they cle	rarry ine secturer participates in the different panels, tr	ying to give suggestion if nee	ged and collecting new	
of how the membrane separation proces			the objects, which are separated in membrane pr	ocesses.	The answers, reported in a form for each application			
2. Identification of the main criteria used to	select a membrane, also v	with respect to other			topics of the rest of the lecture are anticipated to	provide students with food fo	r thoughts.	
separation processes. 3. Correctly writing the mass balance equat	and for mambrane	tion in the different court of	Method (chose one) Involvement	Graded Not graded	Method (chose one)	Conded	Not an ded	
Correctly writing the mass balance equat desired product in the permeate or reten			Individual home assignment	Not graded	Involvement Individual home assignment	Graded	Not graded	
recovery or separation factors)		20 5.00	Individual work in the classroom		Individual work in the classroom			
4. Correctly writing the mass fluxes through	different types of membra	anes and operating conditions	Collaborative home assignment		Collaborative home assignment			
(including the occurrence of concentration and estimating the required surface area	n polarization and the con	rection for osmotic pressure)	Collaborative work in the classroom	l x	Collaborative work in the classroom		x	
Keeping high the interest for the lecture !	opics		Description of the activity: The students are shown some pictures and they a	re arked to discuss and in groups and tell if what	Description of the activity: The students are asked to fill a table with the adva	-t (mp.ne) d did	(CONT) - f	
6. Enhancing the participation of the studer	ts during the lecture		represented in the picture can be defined as a me	mbrane or not.	membrane separation in comparison with other se	entages (PROS) and disadvant eparation processes.	ages (CONS) or	
Kind of active learning activities adopted (choose	as many as necessary);		They are also asked to provide a brief explanation	of why they think it is or it is not a membrane.	They are invited to work in groups, to discuss with	peers, focusing on a specific	application, which is	
Check of background knowledge First approach to a new subject X			The discussion should take place with peers in gro		assigned by the lecturer at the beginning of the ac	tivity (e.g. Waste water treat	ment, juice concentration	
Assessment of learning X			The discussion should take place with peers in gro Then, the corresponding form (provided in the ac	ups, and continue until consensus is reached.	beer clarification, desalination, and whey protein r Each student is asked to contribute to populate a i	recovery).	elication with an	
Development of a case study			Attachments & links	arry section y service of mice.	individual contribution, or voting for the terms alre		piicauon with an	
			See attached pdf file (Food Process Design - Activ	ty 1 - Is this a membrane).	Each filled table is then commented in the classroo			
					Attachments & links			
DESCRIPTION OF THE Number (in time order) Expected duration of the activity (minutes)	30 min	TY	DESCRIPTION OF THE Number (in time order) Expected duration of the activity (minutes)	ACTIVE LEARNING ACTIVITY 4 60 min in classroom	The following conditions apply: density of milk = 1. bulk solute concentration c ₀ = 3.1% weight per unit cm, number of tubes = 15, and fluid velocity = 1.5 r	t volume. Diameter of the tub	liffusivity = 7·10° cm²/s, e = 1.1 cm, length = 200	
Collocation of the activity			Collocation of the activity		[assume a gel concentration of 22%]			
The activity is collocated after the introduction of		mbranes, the mass balances	The activity is collocated at the end of the lecture		tic Problem 3			
and the definition of the recovery and separation	factors.		pressure, solvent and solute mass fluxes in memb membrane surface area.	ranes, concentration polarization, estimation of	An ultrafiltration system is being used to concentra rate was 1630 L/m² per day at 5% solids by weight	ate gelatin. The following data t concentration, and a flux rat	a were obtained: a flux e was 700 l /m² per day of	
Teaching challenge addressed 3. Correctly writing the mass balance equat	ions for membrane senara	tion in the different cases of	Teaching challenge addressed		10 % solids by weight.	tonteneration, and a year rat		
desired product in the permeate or reten	tate, using the typical man	do de consessa de contra d			ditions Determine the concentration of the gel layer and to			
recovery or separation factors)			 Correctly writing the mass fluxes through 	different types of membranes and operating con-		he flux rate at 7 % solids.		
 Enhancing the participation of the studer Kind of active learning activities adopted (choose 		nuracturer specifications (e.g.	(including the occurrence of concentratio	different types of membranes and operating con- n polarization and the correction for osmotic pres	Problem 4	10		
Check of background knowledge	onej	nuracturer specifications (e.g.	(including the occurrence of concentratio and estimating the required surface area	n polarization and the correction for osmotic pres	Problem 4 An ultrafiltration system is being used to concentre content of 10 % to 35 % total solids.	10		
First approach to a new subject		suracturer specifications (e.g.	(including the occurrence of concentratio and estimating the required surface area 6. Enhancing the participation of the studen	n polarization and the correction for osmotic pres ts during the lecture	An ultrafiltration system is being used to concentre content of 10 % to 35 % total solids. The ultrafiltration system contains six tubes with 1	ate orange juice at 30°C (1.5 k	ig/s) from an initial solids	
Assessment of learning		unacturer specifications (e.g.	(including the occurrence of concentratio and estimating the required surface area 6. Enhancing the participation of the studen Kind of active learning activities adopted (choose Check of background knowledge	n polarization and the correction for osmotic pres ts during the lecture	worken 4 An ultrafiltration system is being used to concentre content of 10 % to 35 % total solids. The ultrafiltration system contains six tubes with 1 of 1100 Agm ² , viscossity of 1.5.10° Po. s, and solute	ate orange juice at 30° C (1.5 k) 1.5 cm diameter. The product is a diffusivity of $2 \cdot 10^{\circ}$ m ² /s.	ig/s) from an initial solids	
Development of a case study	×	unacturer specifications (e.g.	(including the occurrence of concentration and estimating the required surface area 6. Enhancing the participation of the studen Kind of active learning activities adopted (choose Check of background knowledge First approach to a new subject	n polarization and the correction for osmotic pres ts during the lecture	sure) An ultrafiltration system is being used to concentre content of 10 % to 35 % total solids. The ultrafiltration system contains six tubes with 1 of 1100 kg/m², viscosity of 1.3.10° Po s, and solute The concentration of solute of the membrane surf.	ate orange juice at 30°C (1.5 k 1.5 cm diameter. The product j e diffusivity of 2·10° m²/s. ace is 25 %.	ig/s) from an initial solids properties include density	
	x	unacturer specifications (e.g.	(including the occurrence of concentration and estimating the required surface area 6. Enhancing the participation of the studen Kind of active learning activities adopted (choose Check of background knowledge First approach to a new subject Assessment of learning	n polarization and the correction for osmotic pres ts during the lecture	worken 4 An ultrafiltration system is being used to concentre content of 10 % to 35 % total solids. The ultrafiltration system contains six tubes with 1 of 1100 Agm ² , viscossity of 1.5.10° Po. s, and solute	ate orange juice at 30°C (1.5 k 1.5 cm diameter. The product j e diffusivity of 2·10° m²/s. ace is 25 %.	ig/s) from an initial solids properties include density	
Strategy	X If the strategies of solution		(including the occurrence of concentration and estimating the required surface area 6. Enhancing the participation of the studen Kind of active learning activities adopted (choose Check of background knowledge First approach to a new subject Assessment of learning Development of a case study	n polarization and the correction for osmotic pres ts during the lecture	An ultrafilitation system is being used to concentre content of 10 % to 3 % total solids. The ultrafilitation system contains six tubes with 1 of 1100 kg/m², viscosity of 1.3 10 ⁴ Pa s, and solute The concentration of solute at the membrane surfessions the state of the system at the length of ultrafilitation tubes require Estimate the length of ultrafilitation tubes require	ate orange juice at 30°C (1.5 k 1.5 cm diameter. The product j e diffusivity of 2·10° m²/s. ace is 25 %.	ig/s) from an initial solids properties include density	
Strategy Discussion is stimulated among the students abore problems about membrane separation processes		n of simple calculative	(including the occurrence of concentration and estimating the required surface area 6. Enhancing the participation of the student Kind of active learning activities adopted (choose Check of background knowledge First approach to a new subject of a season of a case study Strategy The students are asked to solve more advanced or the students are asked to solve more advanced or the students are asked to solve more advanced or subject to the students are subject to the students are subject to the students are subject to the subj	n polarization and the correction for osmotic pres ts during the lecture one) X X	An ultraffitration system is being used to concentre content of 10 % to 38 % to 10 % t	ate orange juice at 30°C (1.5 k 1.5 cm diameter. The product j e diffusivity of 2·10° m²/s. ace is 25 %.	ig/s) from an initial solids properties include density	
Strategy Discussion is stimulated among the students abore problems about membrane separation processes. This gives the chance to the lecturer to verify that	the mass balance equation	n of simple calculative	(including the occurrence of concentration and estimating the required surface area. 6. Enhancing the participation of the student of short are advanced to processes, including the estimation of solvent are	n polarization and the correction for osmotic pres ts during the lecture one) X X	An ultraffitration system is being used to concentre content of 10 % to 38 % to 10 % t	ate orange juice at 30°C (1.5 k 1.5 cm diameter. The product j e diffusivity of 2·10° m²/s. ace is 25 %.	ig/s) from an initial solids properties include density	
Strategy Discussion is stimulated among the students abo problems about membrane separation processes. This gives the chance to the lecturer to verify tha The free text part of the answer is used to verify the	the mass balance equations the analytical skills of the s	n of simple calculative of simple calculative nois are correctly written.	(including the occurrence of concentration and establishment of the regime suffice area as establishment of the participation of the student	n polarization and the correction for osmotic pres sis during the lecture one) X X Association and the control of the control of the control of the salculative problems about membrane separation solute fluxes through the membranes and the	Webban Membra by the high grade to accepte content of 10 km s he had grade to accepte content of 10 km s 10 km lead acids. The untreflection system contains as the day with 1 content of 10 km s 10 km lead acids. The concentration of solute at the membrane surface accepted to the membrane surface accepted to the leading of dispositions to takes require Mathamaseus & Risks Nation.	ate orange juice at 30°C (1.5 k 1.5 cm diameter. The product j e diffusivity of 2·10° m²/s. ace is 25 %.	ig/s) from an initial solids properties include density	
Strategy Discussion is stimulated among the students aborproblems about membrane separation processes. This gives the chance to the lecturer to verify that The free text part of the answer is used to verify problems formulated differently from what prese	the mass balance equations the analytical skills of the s	n of simple calculative of simple calculative nois are correctly written.	(including the occurrence of concentration and estimating the required surface area. 6. Enhancing the participation of the student of short are advanced to processes, including the estimation of solvent are	n polarization and the correction for osmotic pres st during the lecture one) X	Webban Membra by the high grade to accepte content of 10 km s he had grade to accepte content of 10 km s 10 km lead acids. The untreflection system contains as the day with 1 content of 10 km s 10 km lead acids. The concentration of solute at the membrane surface accepted to the membrane surface accepted to the leading of dispositions to takes require Mathamaseus & Risks Nation.	ate orange juice at 30°C (1.5 k 1.5 cm diameter. The product j e diffusivity of 2·10° m²/s. ace is 25 %.	ig/s) from an initial solids properties include density	
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Figure 1. Example of filled active learning documentation form

The project had originally planned 3 staff visits to Cambodia, Thailand and Malaysia in spring-summer 2020, in which the visitors from the European Universities should have met representatives of the master course instructors in each of the countries to present the developed approach and the training materials. Due to the CoViD19 sanitary emergency, travelling was not possible. Therefore, as a fifth and final step, the presentation of the developed approach and of the training materials was switched to on-line webinars. The produced materials were uploaded on a dedicated web server and 6 one-hour interactive lectures were delivered on-line by the UNISA team between 03/08/2020 and 07/08/2020. During these lectures, examples of active learning applied to the assigned courses were provided. The interactive on-line webinars were attended by about 30 lecturers from the Asian partners (Cambodia, Thailand, and Malaysia), who actively participated and provided an individual assessment through a webinar appraisal form. The Asian attendants rated the webinars with an appreciation grade of 85% in the average, generally accepted the proposed approach toward active learning and positively evaluated the methodology transfer with an appreciation grade of 70% in the average. In addition, comments and other suggestions written in the webinar appraisal forms were collected by UNISA staff and used to further improve the active learning documentation supporting the Asian trainers.

The efficiency of the proposed learning activities will be validated only at a later stage, when the master course in Food Processing and Innovation will be delivered. The student surveys implemented in the active learning material will be used by the trainers to consolidate, improve or adjust the developed active learning materials.

5. Conclusions

Examples of learning activities were developed to be applied to six modules of the master course "Food Processing and Innovation" within the frame of the FOODI project. Through a survey, the teaching/learning needs were preliminary collected to drive the approach towards active learning in the teaching process and to tailor its design. The work done was communicated to the users (i.e., the Asian partners of the project, future lecturers of the master course), using a specifically designed form. A constructive peer review process was adopted to verify the material produced and to homogenize its presentation. The examples of active learning tasks, constructively linked and effectively interacting with preselected lecture subjects, were presented in 6 web seminars in August 2020, within the frame of the FOODI project, to an audience of 30 experienced lecturers from Asian countries, who provided a positive feedback in an individual webinar assessment form. The validation of the proposed active learning approach will be given in the next future, when the master course Food Processing and Innovation will be delivered in the different Asian countries (as planned for the academic year 2021-22).

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