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Curriculum Development for Sustainable Seafood and Nutrition Security

Project Acronym

SSNS

Deliverable 2.6: Teachers' Guide

Prepared by:

Jørgen Lerfall[1], Anita N. Jakobsen[1], Amaya Albalat[2], Ram C. Bhujel[3] Nguyen T. Phuong [4] and Alim Isnansetyo[5]

[1]Norwegian University of Science and Technology (NTNU), Norway
[2]University of Stirling (UoS), UK
[3]Asian Institute of Technology, Thailand
[4]Can Tho University, Vietnam
[5]University of Gadjah Mada, Indonesia

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1. General guideline

1.1. What is a good teacher?

Students should be able to provide their own motivation and discipline at the university level and bring their own already developed cognitive abilities to bear on the subject of matter. Nevertheless, the teacher still has a crucial and demanding role in student learning by creating a context in which the students' desire and ability to learn can work most effectively (Fry, 1999). The task of the teacher in higher education has moreover many dimensions that are important to consider to improve student learning, where some of them are:

- Provision of a broad context of knowledge within which students can locate and understand the content of their more specific studies.
- Creation of a learning environment in which students are encouraged to think carefully and critically and express their thoughts, and in which they wish to confront and resolve difficulties rather than gloss over them.
- Continually monitoring and reflecting on the processes of teaching and student understanding and seeking to improve them.
- Helping students to achieve their aims, and to adopt the notion that underlies higher education: that students' learning requires from them commitment, work, responsibility for their learning, and a willingness to take risks, and that this process has its rewards, not the least of which is that learning can be fun!

None of the mentioned tasks are easy to achieve. However, it is essential to have them in mind to perform good teaching and increase the student learning outcome. In addition to the different dimensions mentioned above, it is essential to point out characteristics that improve the teaching from an individual lecturer's point of view. The followings are the list of characteristics of a good teacher (modified from Ramsden, 2003):

- Formal or informal educational degrees or attainment as per the requirement by law or regulation
- Adequate knowledge on the subject matter or ability to gather more when needed
- Reasonable skills and experience on the subject matter and techniques
- Ability to explain the importance of learning outcomes and need for their career, community, and the country
- Desire to share your love of the subject with students
- Ability to make the material being taught stimulating, interesting
- Able to provide a facility for engaging students at their level of understanding

- Capacity to explain the material plainly and also in-depth as per the need
- Commitment to making it clear what has to be understood at what level and why
- Adequate sympathy on students and respect for them
- Commitment to encouraging independence
- Ability to improvise and adapt to new demands
- Ability to use teaching methods and academic tasks that require students to learn actively, responsibly, and co-operatively
- Capable of using valid assessment methods to evaluate independently and fair manner
- Ability to focus on critical concepts, and student's misunderstandings, rather than covering the ground
- Giving the prompt and highest quality feedback on student work
- A desire to learn from students and other sources about the effects of teaching and how it can be improved
- Good skill of receiving feedback from students and adapt teaching contents and methods based on their needs
- Ability to make students cautious about potential risks and dangers

It is crucial to let the student evaluate the teacher's performance and teach constructively to improve teaching. Ramsden (2003) pointed out that highly rated lecturers are good at explaining clear and understandable theories for students. They can make difficult work comprehensible without oversimplifying, using simple language. If technical language is used, it is essential to define complicated phrases clearly. They can choose teaching methodology and digital tools to support student learning (see the teaching methodology section) in lectures. Moreover, it is important to illustrate abstract concepts with examples and distinguish between the concept and the practical example.

To become a highly rated lecturer, it is crucial to be well prepared, structured in your content, have a good communication structure of your lectures, and choose adequate teaching methodology for the subject. Subject objectives need to be clearly defined, and it is important to emphasize important points. Moreover, a highly rated lecturer speaks clearly and in an appropriate speed giving adequate time for students to take notes and listen.

Knowledgeable teachers that focus on research-based teaching (see chapter 1.2) are often highly liked among students. It is moreover essential for teachers not to pretend to "know it all". Willingness to learn from their students is also essential, where many teachers recognize that work experience makes many part-time and senior students a valuable resource.

In mostly all teaching types, student participation is encouraged in lectures and tutorials or laboratory sessions. Lecturers that allow student participation have often experienced that most students gained a better understanding of active involvement than passive note-taking (Freeman, et al., 2014).

Giving students time to engage with the subject matter actively means reducing the time available to cover new content. The lecturers' most frequent strategies for gaining time without compromising course objectives were:

- Providing students with printed subject notes and/or summary handouts, thus reducing note writing, and encouraging students to highlight key points, add comments and note insights generated during class interactions.
- Explain fundamental concepts and examples in a short lecture and encouraging students to access texts and references for further details and multiple examples.
- Reducing the content covered in lectures to central areas and encouraging more extensive reading and/or integrating work experience through carefully designed assignments and tutorials.

Highly rated lecturers genuinely want students to learn, understand and develop critical thinking abilities and master content and/or learn skills. They often demonstrate empathy with students in the way of thinking, which allows students to develop understanding in various ways. Highly rated lectures encourage student feedback on their teaching and often sought informal feedback during classes. To become a highly rated lecturer, enthusiasm for the subject, professional area, and the teaching role is essential, which will motivate the students! Critical personal skills that often are mentioned related to the highly-rated lecturers are "easy-going", "relaxed," or "open" manner, and the relaxed atmosphere that this brought to the classroom. Students also appreciated appropriate humor and an attitude, which suggested that learning was enjoyable.

1.2. Definition of "research-based teaching" and employability

1.2.1. Research-based teaching

The research-based education model (Figure 1) is shaped by the Humboldt ideal of a university where research and teaching occur side by side. Bringing teaching and research closely together is an idea

that originates from German universities in the early nineteenth-century (Huet, 2018). This ideal was led by the philosopher Humboldt, who believed the pursuit of (new) knowledge should be conducted by academics and students, who would work side by side as co-researchers. This approach to knowledge construction occurs in a learning environment where research and inquiry inform teaching and vice versa. The Humboldt ideal of a research-based education is based on students' 'disinterested

search of truth' (Haverhals, 2007) through the cultivation of 'pure' academic inquiry. This discovery process was perceived as an end in itself, as a 'training of intellect' (Haverhals, 2007), without a focus on the 'practical' activities, and without therefore being immediately 'useful' (Newman, 2010). By engaging in the process of 'pure' inquiry, individuals were educated to construct knowledge that would sustain the 'transformation of society from below and from within' (Haverhals, 2007), thereby serving the purpose of shaping individuals' character formation and contributing to their holistic education as critical thinkers and responsible citizens.

In European and Asian post-modern universities, research and inquiry are not necessarily the same as in Humboldt's modern university concept. Research-active academics are not always interested in spending time and effort in pedagogical innovations. In a report produced for the National Research Council Board of Science Education, Fairweather (2008) refers to STEM academics' resistance to adopting more effective teaching strategies. According to the author, this derives from the perception Science, Technology, Engineering, and Mathematics (STEM) academics have that the teaching process is at odds with the research process, and that research is more exciting and more valued at their institutions.

Barnett (2003) suggests many pressures are pulling research and teaching apart; 'the twentieth century saw the university change from a site in which teaching and research stood in a reasonably comfortable relationship with each other to one in which they became mutually antagonistic'. Moreover, Barnett suggests that research and teaching are not contradictory roles and should not be seen as such in more teaching or research-oriented universities in the U.K. However, institutions need to overcome some tensions to foster links and not create a 'false' marriage between research and teaching.

Knowledge construction, which includes the process of knowledge acquisition, reproduction, and production, encompasses the principles of assimilation and accommodation explored by Piaget (1976). Undergraduate students begin to assimilate the knowledge that is new to them; however, cognitive change and learning only take place when the knowledge that they assimilate is connected to previous knowledge, shaped by social interactions and experiences, and leads to a phase of perturbation and accommodation that is necessary for learning to take place. The cognitive-developmental perspective emphasizes that students should engage in discussion in which the cognitive conflict–perturbation phase is resolved, and inadequate reasoning is modified, leading to a phase of accommodation (Piaget, 1976).

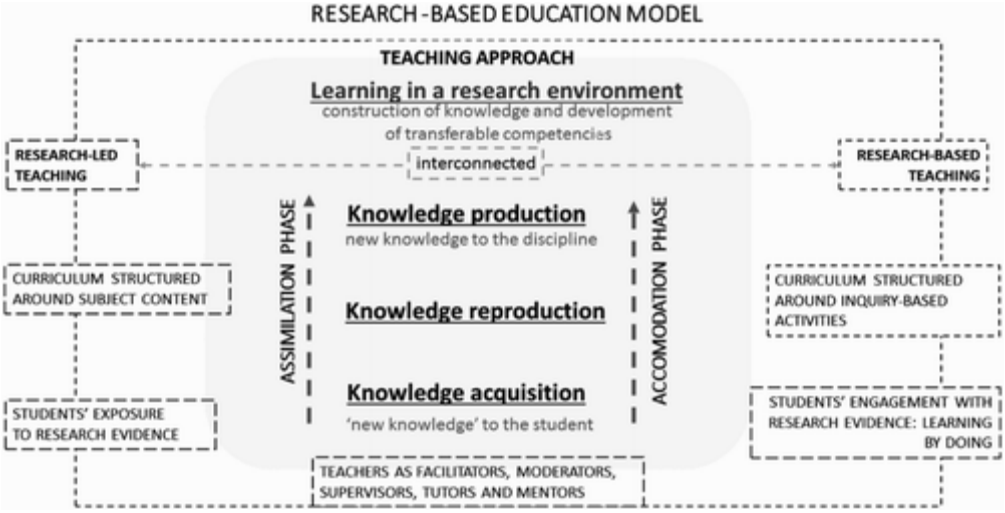

Figure 1. Research-based education model (Huet, 2018)

Constructivists, like Vygotsky, Piaget, or Glasersfeld believed that students learn with each other in a social context and that the knowledge they construct is deeply influenced by the surrounding environment (Piaget, 1976). Following this theoretical concept, research-based education creates an environment that facilitates a culture where students learn by inquiring and searching for answers and solutions for collaboration problems. This environment changes not only students but also academics' conception of what is learning and teaching. Understanding the relevance of such an environment can be underlined by the thinking of Ceccato (Matthews, 2012), the Italian pioneer of conceptual analysis when he wrote that:

"The important thing is to show the child (and nothing changes if we substitute 'the student') the direction in which to go, to teach him to find his own path, to retrace it, and to continue it. Only in this way will he be able to assume a scientific attitude with which he can also approach the things of the mind".

Students are constructing knowledge in a specific subject, and they are also learning how to learn. Consequently, students are educated to become critical thinkers, lifelong learners, acquire and reproduce knowledge that is new to themselves, and progressively contribute to the creation of knowledge that may enrich a discipline's knowledge (s). Following Newman's and Humboldt's philosophical thoughts, knowledge construction should not merely be seen as fulfilling the external purposes addressing the immediate needs of the economy, but as part of the development of an individual and contributing to their development as critical thinkers and agents of change in society. The purpose of research-based education is therefore important for the achievement of these goals.

In this approach to education, academics can adapt different teaching approaches, divided into research-led teaching and research-based teaching.

1.2.2. Employability

Employability is influenced by many factors and is not merely getting a job or a set of skills taught to the students. Several definitions exist in the literature. An investigation undertaken for the U.K. Department of Education and Employment led to the development of a definition and framework to operationalize employability: "Employability is the capability to move self-sufficiently within the labor market to realize potential through sustainable employment. For the individual, employability depends on the knowledge, skills, and attitudes they possess, the way they use those assets and present them to employers and the context (personal circumstances and labor market environment) within which they seek work" (Hillage and Pollard, 1998). Small, et al. (2018) defined employability "as the capacity to be self-reliant in navigating the labor market, utilizing knowledge, individual skills and attributes, and adapting them to the employment context, showcasing them to employers, while taking into account external and other constraints". Pool and Sewell (2007) developed a CareeEDGE model of graduate employability, each component crucial to success (Figure 2)

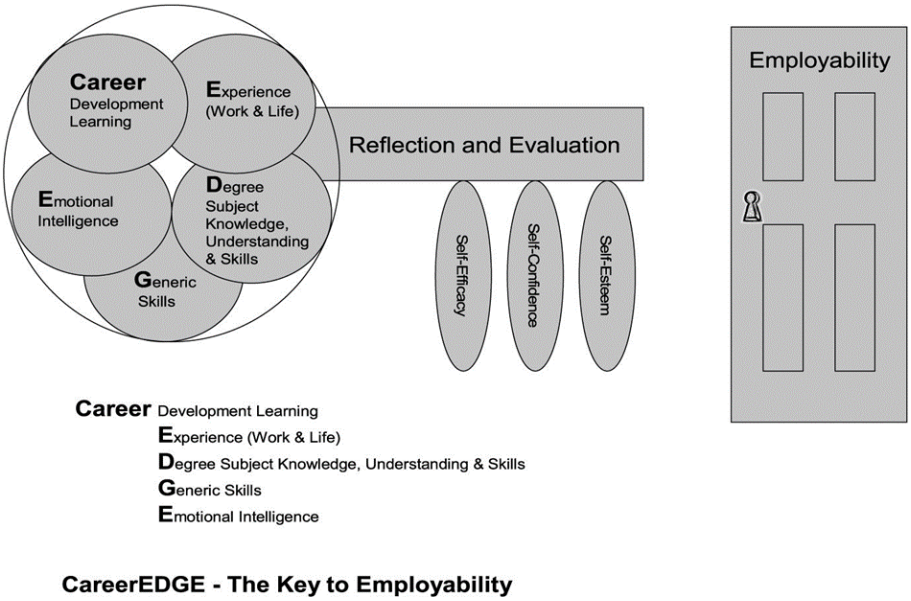

Figure 2. The CareerEDGE model of graduate employability (Pool and Sewell, 2007).

1.2.3. Planning, teaching- and assessment methodology in higher education

Universities play a fundamental role in the advancement of both theoretical and applied knowledge. From an education perspective, as highlighted by Harvey and Green (1993), quality is about meeting demands, expectations, and standards on the one hand and encompasses excellence, diversity,

relevance, and efficacy. Therefore, when developing a curriculum or a module within an existing curriculum, it is important to embrace excellence and diversity; relevance and efficacy play essential roles in student learning. These factors will be the basis for student engagement, which, together with appropriate learning activities, have been identified as crucial factors determining student success. As recommended by the UK Professional Standards Framework for learning and teaching in higher education, core knowledge needs to be aligned with the type of activities developed.

The term "Constructive alignment" is often used, and Biggs and Tang (2011) defined it as the coherence between learning outcome, teaching strategies, and assessment methods in a course or an educational program. These must also be present in the course activities and the final assessments to achieve the defined learning outcomes. In this way, the learning outcomes, assessments, and learning activities are aligned (Figure 3).

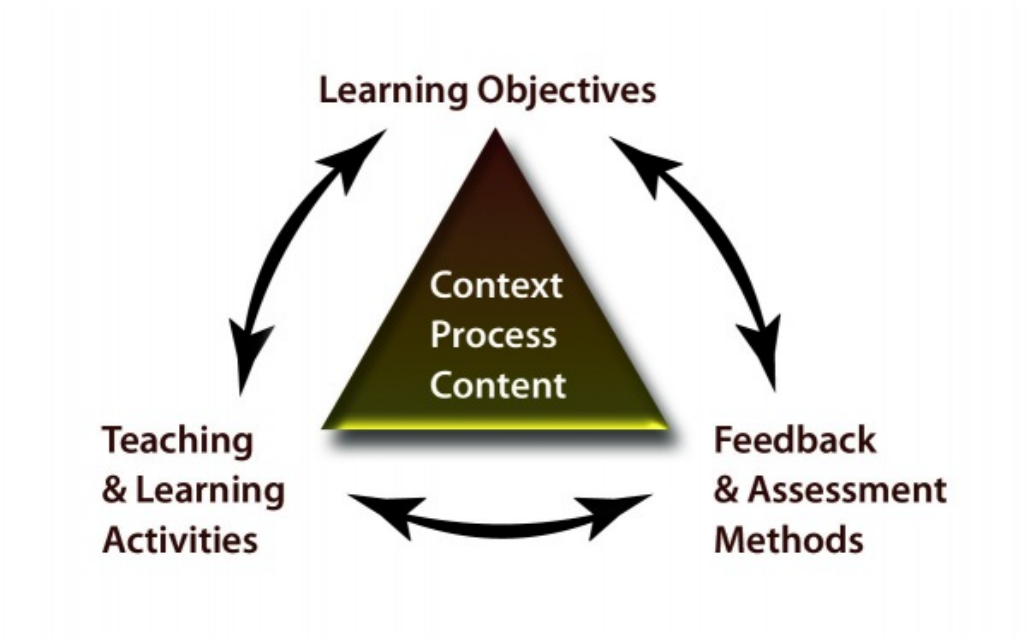

Figure 3. Constructive alignment as established by Biggs and Tang (2011): Planning a course so that the learning outcomes, learning activities, and assessment methods work together.

When designing a new course, it is essential to consider what knowledge, understanding, and skills one wants the students to learn. The following questions can be used as a guide to this process:

1. What do I want students to know (core knowledge-theoretic) and do (skills-practical work) by the end of the course?
2. What level am I aiming for?
3. What will the students need to do to demonstrate (different degrees) that they have achieved these objectives?

Using Cowan and Harding (1986) for course design (Figure 4), the aims and intended learning outcomes are made explicit at the start of the design process, and then these are aligned to the methods employed and the methods of assessment.

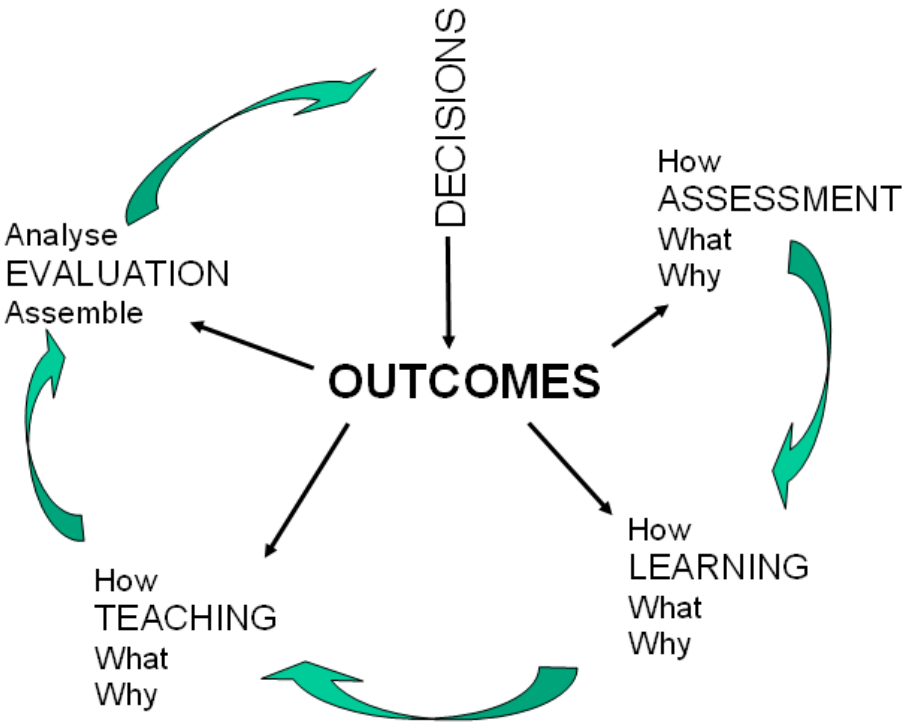

Figure 4. Cowan and Harding Model of constructive Alignment (Cowan and Harding, 1986).

Although there is no right way to establish the most appropriate teaching and learning methods for a particular course, it is essential that the methods align with the course's aims and intended learning outcomes. The used methods should moreover suit your skills and be suitable or appropriate to your students' level.

1.2.4. Teaching methodology

Active learning is a teaching method that engages students in learning through activities and discussions in class instead of passively listening to an expert as in traditional lectures (Freeman, et al., 2014; Prince, 2004). Several studies have demonstrated that active learning leads to better students' attitudes and motivation for studies and improves students' scientific performance and development of thinking and communication skills (Freeman, et al., 2014; Mathias, 2014; Prince, 2004). Active learning moves the classroom from a teacher-centered to a more student-centered model. Active learning methods often include group work, case studies, problem-based learning, flipped classroom, and digital, e.g., games, simulation tools, etc.

1.2.5. The distribution between theoretical and practical work

Traditional lectures are often what students expect at the university. Lectures bring a sense of belonging and can be a good way of providing shared experiences that help build a sense of belonging. Other positive aspects of the traditional lecture format include:

1. Lectures can provide a useful overview or outline on an area of study and can be used to introduce fundamental concepts or critical ideas, which can then be further developed in seminars or tutorials.
2. The research-active lecturer can use lectures to bring an individual perspective to a topic that might be now moved on from information available in textbooks.
3. Familiarization with discipline-specific language and syllabus

However, lectures are best seen as only part of the whole teaching strategy than the only teaching method in any module or course. This is because while lectures are particularly suited to improve student's knowledge and comprehension (lower orders of intelligent behavior), they are unlike to provide students with an opportunity to apply knowledge, analyze, synthesize and evaluate information (please see Figure 5 on intellectual, behavioral levels according to Bloom's taxonomy).

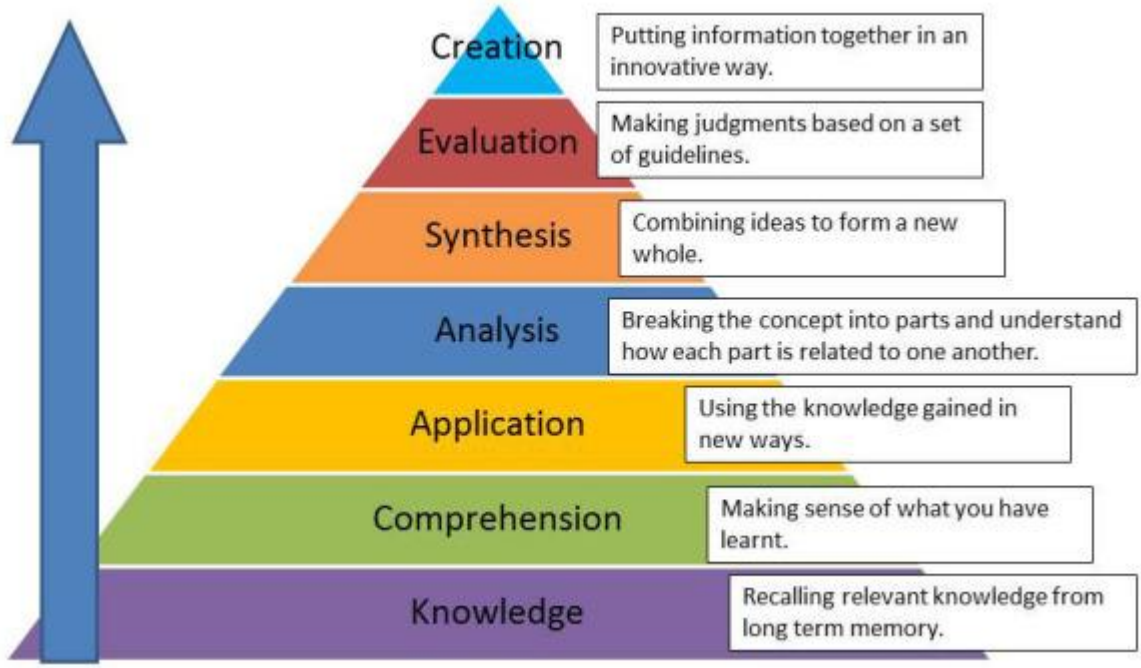

Figure 5. Bloom's taxonomy of intellectual, behavioral levels (Bloom, 1956).

The use of interactive methods in lectures appears to deepen understanding, and research also shows that clarity of presentation, structure, and expression are critical factors in effective lecturing. However, it is essential to be aware that while lectures might be an effective method for imparting information, a familiar figure quoted concerning lectures is that students recall approximately 40% of

information immediately after a session. Bloom (1956) found that students thought about attempting to solve problems or synthesize or inter-relate information for only 1% of the time during lectures. For 78% of the lecture, students had 'passive thoughts about the subject' or even 'irrelevant thoughts'. Therefore, a large group of students who appear to look very busy writing during a lecture should not be taken to indicate that any deep learning is occurring there and then. Critical variables in good lecturing are clarity and interest, which can be generated by using personal narrative and striking examples. On the other hand, common weaknesses in lectures include:

- Saying too much too quickly
- Assuming too much knowledge
- Forgetting to provide a summary
- Timing
- Not indicating reservations
- Not confident about own knowledge
- Not linking sections or sessions together
- Using too much technical language
- Practical pointers and effective practices in lecturing:
- Become comfortable with the material

According to Penner (1984), the average student's attention span is ten to fifteen minutes. Therefore, when planning a lecture, it is recommended to change the pace every fifteen minutes to recapture students' interest. This can be done, for example, by organizing activities/tasks within the lecture. While lectures are a suitable method for transmitting information, it is a less effective method to promote independent thinking. It is also important to decide the content to cover and set broad goals and more specifically learning outcomes for the course and individual sessions. In addition, a meaningful sequence will improve learning. Examples of excellent course organizational patterns include topical, causal, sequential, symbolic or graphic, structural or problem-solving.

The course structure and an explicit lecture that is adapted to the students will improve the engagement. Examples of formats as presented by Frederick (1986) include expository lecture (traditional lecture that treats a single aspect), interactive lecture (where students are asked to generate ideas in response to a question or topic), problem-solving or case study method where a realistic situation is explored to illustrate a general principle and short lectures that allow discussion periods. However, to succeed, several small actions and skills are important

- Consider the abilities and interests of your students

- Prepare a detailed syllabus for the students
- Use vivid examples to illustrate your points
- Connect new lectures to previous ones
- Do not assume too much knowledge
- Begin and end with a summary statement
- Be enthusiastic
- Seize learning moments

It is always recommended that 'traditional' lectures supplement activities such as project work, laboratory work, fieldwork, peer tutoring, case studies, seminar discussions, and inquiry-based approaches. A fundamental principle should always be that the methods used should support learning outcomes and students' learning styles. For example, a discussion followed by a lecture might be more useful for creating a new conceptual framework.

1.2.6. Feedback and assessment of student learning

The term assessment is derived from “ad sedere” – to sit down beside. The etymology implies that it is primarily concerned with providing guidance and feedback to the learner. Feedback and assessment are a fundamental aspect of the student experience and are essential to promote learning, it enables them to reflect and build on their learning and is important for their motivation (Hattie and Timperley, 2007; QAA, 2018). The assessment also helps other stakeholders, e.g., instructors, administrators, and future employers, to evaluate different aspects of the education as the student development, the value of specific courses, and the credibility of an institution.

There are two main assessment categories:

- Formative assessment: Assessment with a developmental purpose, designed to help students learn more effectively by giving them feedback on their performance and how it can be improved and/or maintained. The goal is assessment for learning.
- Summative assessment: Assessment used to indicate the extent of a student's success in meeting the assessment criteria to gauge the intended learning outcomes of a module or course. Typically, the marks awarded count towards the final mark of the course/module/award within the summative assessment. The goal is an assessment of learning

Knight (2001) looked at some of the differences between summative and formative assessment (see Table 1). It can be a useful exercise to consider whether your assessment practices fall primarily in the summative or formative arena (or whether you employ a mix of approaches).

Table 1. Summative and formative assessment (Knight, 2001)

Dimensions of difference	**Assessment as measurement (Summative)**	**Assessment as judgment (Formative)**
Ontology (theory of what exists) and epistemology (theory of how we know about it)	Common sense views that there is a readily known reality through diligent use of 'scientific' methods.	There is a problematic relationship between what may exist and what is known. There is not, therefore, any right way to the truth.
Assumptions about achievements	Achievements are seen as transferable. Fair measurements predict achievements in other times and contexts.	There is only a limited transfer of learning, so there can be no strong claim about learners' performance in other contexts. *Assessment data are not good predictors.*
Typical products	'Feedout' in the shape of warrants to achievement	Feedback in the shape of improvement 'conversations'.
Priorities	1. Reliable measures of achievement 2. Motivating learners 3. Providing information to guide learning	1. Providing comments that afford opportunities for better learning 2. Motivating learners
Treatment of tricky human learning achievements	Reductionist. Assumes that tricky achievements can be separated into parts that can be reliably assessed. The total score is then treated as a valid measure of complex achievement.	Complexity has emergent properties, which means that the whole is more than the sum of its parts. Tricky achievements must be judged as they are.
What achievements are most likely to be assessed in this way?	Understandings and performances can be fairly captured by low-inference judgment methods – convergent, routine, lower-order achievements.	Complex achievements – divergent creations, non-routine judgments, 'soft skills'.

Some people mistakenly associate examinations and coursework interchangeably with summative and formative assessments. However, written examinations can be used as a formative assessment as well as a summative assessment. Coursework is very often used as a summative assessment tool. Formative and summative refer to the purpose of assessment rather than to any specific method employed.

In most University settings, assessments fall into two broad categories, namely examinations and coursework. Teachers should choose the best alternatives available rather than practicing the same way as tradition. Assessment should be intended to know about the level and wealth of information (knowledge) students have gained and the level of particular skills they have acquired during the practical/field. Typical approaches within these two categories are shown in Table 2.

Table 2. Typical approaches used in examinations and coursework assessments.

Examinations	Unseen paper (standard exam) Open Book (students can take books in to refer to) Seen paper (students are given the paper before the exam) Single essay exam (three hours on the prepared topic) Take-away Paper (students are given 2/3 days to do exam) Oral exam or viva voce OSCE (objective structured clinical examination, clinical settings) Essay questions Short answer questions Objective questions, multiple choices Practical and other performance testing approaches Objective questions, e.g., multiple-choice, true/false statements, matching statements, etc.
Coursework	Project reports Fieldwork or trip reports Laboratory reports Portfolios Reflective logs/Diaries Group work/group projects Workshop and presentations (individual or group) Essays Reports Critical reviews Articles Reaction papers (short critical reviews of course reading undertaken regularly throughout the course) Question setting (student task is to set questions or design task most appropriate to assessing the subject) Objective questions Short answer questions Practicals Dissertations Production of a video Production of an article for a magazine/newsletter Plan of action for exhibition/play

There is a common understanding in education today, grounded in research and practice, which it is suitable for students to learn together – that group work is suitable for their learning.

A central feature of group work is communication – exchanging and developing information, ideas, and practices. This stands in contrast to more didactic, or at least tutor-controlled, dialogue that takes place in other educational settings. There is the opportunity for 'co-operative learning' (McConnell, 1994), where co-operative learning is process-driven, i.e., those involved in co-operative learning engage in a social process and have to pay attention to that process in order to achieve their desired endpoint. It involves people working in groups, there may be group 'products' towards which the

learners are working, and there may be individual 'products' achieved through the people in the group helping each other deal with their particular learning concerns.

Group work within a learning programme can be set for an engagement simultaneously in one place, separately over time with scheduled meetings, and/or 'virtually', using online resources and electronic forms of communication where appropriate. It is broadly true to say that many of the same issues arise whether the assessment of group learning is associated with online classes, working across a distributed learning environment supported by information technologies, or not. Significant issues for the students themselves involve 'pulling weight' and fairness and the fear of plagiarism, or at least credit-taking.

Many 'co-operative learning tasks', online or off-line, are assessed by presentation or poster display. Others are assessed in terms of a tangible product' developed as part of the learning task. Others are deliberately and explicitly assessed in terms of performance as a group' with individual assessment 'built in'—peer assessment of individual performance within learner group work.

They suggest an (extensive) rule of thumb for rating group contribution on a four or five-point scale (McConnell, 1994). The value of this will, of course, depends on the students' understanding of the quality terms and agreement of what they relate to (reflect) within the given learning context (NB 'average' here meaning 'much the same as the rest of the group'):

1. for a major contributor
2. for an average contributor
3. for a below-average contributor
4. for no contribution to this task

The assessing method aims to help students to achieve a specific learning outcome. The universities have traditionally used summative assessments at the end of a course, but other methods might be more appropriate to stimulate learning and to assess the described learning outcome. For example, if we want to test students' laboratory skills, and observed performance assessment scheme might be more appropriate. If we want to test students' oral communication skills, oral classroom presentation might be the best choice. If we want the students to demonstrate reflection and reasonable argumentation, an essay or an article review might be suitable. Digital tools for assessment and feedback are increasingly used. It broadens the possibilities and opportunities for fast feedback, but like all assessment methods, it has disadvantages and advantages.

The QAA (2018) have provided ten guiding principles for assessing courses:

1. Assessment methods and criteria are aligned to learning outcomes and teaching activities
2. Assessment is reliable, consistent, fair, and valid
3. Assessment design is approached holistically
4. Assessment is inclusive and equitable
5. Assessment is explicit and transparent
6. Assessment and feedback are purposeful and supports the learning process
7. Assessment is timely
8. Assessment is efficient and manageable
9. Students are supported and prepared for assessment
10. Assessment encourages academic integrity

1.3. General learning outcomes for the SSNS MSc program

General learning outcomes of the students the SSNS MSc program are to be able to:

- describe the past and present status and trend of seafood production, trade, and consumption at the national and global level
- describe the importance and roles of seafood on food and nutrition security from the family, community, national and global perspectives
- develop conservation measures and wise use of aquatic resources
- design and describe various systems of seafood production
- develop and describe various methods of seafood processing and product development
- identify the problems of the seafood value chain, i.e., production, distribution, and consumption areas
- advocate sustainable solutions to the problems based on the local context

1.3.1. Local management

Definition of the number of lectures per credit, credits per subject, distribution between theoretical- and practical work etc.

- MSc degree requirements
- 48 credits total (24 credits courses and 24 thesis research)
- Each course can be 1-3 credit per course
- One credit is equivalent to 15 hours (1 hour/week) of theory or 3 hours of practical
- 6 – 12 courses are adequate for an MSc degree program, i.e., 24 credits

1.4. Compulsory courses

The courses are basic courses required to be taken by every student to complete the degree. They are also called required courses. These courses provide the necessary knowledge and skills required for that specialization. For example, among the courses developed by teachers so far for SSNS curricula, the following courses were agreed to offer as compulsory or basic courses:

- Sustainable Seafood and Human Nutrition
- Seafood Value Chain (production, trade, and consumption)
- Seafood Safety and Certification

Similarly, each University Project Team will select few more courses for this category, consulting with teachers, students, and other stakeholders later.

1.5. Elective courses

The courses are diverse, and students do not need to take all of them, but they can select the ones that match their specific interests. These courses provide additional specialties. For example, among the courses developed by teachers so far for SSNS curricula are:

- Fisheries management
- Cleaner seafood production
- Aquaculture engineering
- Seafood product development and innovation, etc.
- Aquatic seed production
- Aquaculture Nutrition and feed technology
- Aquatic animal health
- Research methodology, statistics, and ethics
- Seafood and the environment
- etc.

All the courses, which the participating lecturers have developed will be considered of this category. FurtehrFurther consultation and discussion will be needed for teachers, students, and other stakeholders later to scrutinize the list of courses.

1.6. A general reading list that supports the primary learning outcome of the curriculum

1.6.1. Academic books

- Water Quality in Ponds for Aquaculture by C.E. Boyd, Auburn University., Aquaculture Engineering 2nd Edition by Odd-Ivar Leekang, Wiley-Blackwell
- Seafood and Aquaculture Marketing Handbook by C. Engle, K. Kwamena Quangrainie and M. M. Dey, Wiley-Blackwell
- Statistics for Aquaculture by Ram C. Bhujel, Wiley-Blackwell.

1.6.2. Scientific journals

- Food Science & Nutrition
- Fish and Fisheries
- Aquaculture
- Aquaculture Research
- Aquaculture Nutrition
- Reviews in Fisheries Science and Aquaculture
- Reviews in Aquaculture
- Aquacultural Engineering
- Aquaculture, Economics, and Management
- Journal of World Aquaculture Society
- Etc.

1.6.3. Magazines

- Aquaculture Magazine of the World Aquaculture Society
- Global Aquaculture Advocate
- Aqua Culture Asia Pacific
- AquaFeed
- etc.

1.6.4. Online resources and development agencies

- FAO – Fisheries Department (http://www.fao.org/fishery/en)
- Globefish
- Fishbase
- WorldFish (https://www.worldfishcenter.org/
- NACA (www.enaca.org)

- SEAFDEC
- Others

1.6.5. Professional societies and associations

- World Aquaculture Society (WAS) and its regional/country branches
- Asian Fisheries Society (AFS)
- National Associations

2. Teachers guide

2.1. Planning

Constructive alignment means planning a course so that the learning outcomes, assessment, and learning activities work together.

To ensure constructive alignment of a specific course, the main principle is to define:

1. What do you want the students to learn?
2. What teaching methodology will you use to enable them to achieve the learning outcome?
3. What assessment tasks and criteria will demonstrate that the student has achieved the learning outcome?

To ensure high-quality teaching, it is also essential to plan the course based on the available infrastructure and external framework as:

1. Available resources: time, teachers, economy, room facilities (for teaching, examination, laboratories, etc.)
2. Available laboratories, fieldwork facilities, excursions
3. Guest lecturers
4. Group size
5. Digital tools
6. Available literature
7. Background of students: Knowledge and skills (practical and generically)

2.2. Teaching/accomplishment

There is no universal best teaching practice; however, a coherence between learning outcome, teaching strategies, and assessment methods must be established, as stated in chapter 1.3. Traditional lectures can be supplemented or replaced with more student-active learning methods. As part of the SSNS MSc curriculum development, a questionnaire was distributed among academic staff and

coordinators of relevant MSc curriculums in Europe and Asia. The questionnaire consisted of questions related to teaching and assessment methodology. In general, the survey gave a clear guideline to define "best practice" regarding teaching methods to increase employability and learning. "Dissertation research project in collaboration with industry", "Case studies," and "Laboratory work" to be the most important in an employability perspective. From a learning perspective, both "Dissertation research project in collaboration with industry" and "Laboratory work" were listed among the top three teaching methods. In addition, the panelist listed "Problem-based learning, PBL" as an appropriate teaching method. Dissertation research projects in collaboration with industry, problem-based learning, and case studies allow students to apply knowledge, analyze, synthesize and evaluate information (please see Figure 5 on intellectual, behavioral levels according to Bloom's taxonomy).

To make employability links clear to students and expand their employability vocabulary, it is suggested that the skills and competency terms employers use should also be used in module descriptors and learning outcomes. Terms commonly used in research and academic job advertisements are; critical thinking, creativity, problem-solving, decision-making, personal effectiveness, communications skills, and commercial awareness. Learning activities that stimulate these skills are related to the development of augments, reflections, evaluating, e.g. through group discussions, writing paper reviews or problem-solving, project planning, designing experiments, analyzing data, presenting data, etc.

Suggestions for further reading regarding active teaching methods (Freeman, et al., 2014) are; group work (Chang and Brickman, 2018; Hammar Chiriac, 2014), case studies (Bonney, 2015), PBL (Allen and Tanner, 2003; Hmelo-Silver, 2004), flipped classroom (Giannakos, et al., 2014) and use of digital tools as, e.g., game-based learning (Li and Tsai, 2013).

2.3. Assessment

One of the most significant tensions in assessment seems to lie between assessment to provide feedback and help students learn (formative) and assessment to establish a level of achievement (summative).

To select an appropriate assessment method, it can be helpful to consider relative merits in terms of advantages and disadvantages for the student and the tutor, as well as evaluating its validity and reliability within your chosen context. In this process, the suggestions by (Nightingale, et al., 1996) can be useful. Nightingale, et al. (1996) identified eight broad categories of learning outcomes (listed below) and suggested suitable assessment methods for each.

2.4. Thinking critically and making judgments

Thinking critically and making judgments includes developing arguments, reflecting, evaluating, assessing, judging. These skills can be trained by activities such as:

- Essay
- Report
- Journal
- Letter of Advice to... (about policy, public health matters…)
- Present a case for an interest group
- Prepare a committee briefing paper for a specific meeting
- Book review (or article) for a particular journal
- Write a newspaper article for a foreign newspaper
- Comment on an article's theoretical perspective

2.5. Solving problems and developing plans

Solving problems and developing plans includes identifying problems, posing problems, defining problems, analyzing data, reviewing, designing experiments, planning, applying information. These skills can be trained by activities such as:

- Problem scenario
- Group work
- Work-based problem
- Prepare a committee of inquiry report
- Draft a research bid to a realistic brief
- Analyze a case
- Conference paper (or notes for a conference paper plus annotated bibliography)

2.6. Performing procedures and demonstrating techniques

Performing procedures and demonstrating techniques include computation, taking readings, using equipment, following lab procedures, following protocols, carrying out instructions. These skills can be trained by activities such as:

- Demonstration
- Role Play
- Make a video (write a script and produce/make a video)
- Produce a poster

- Lab report
- Prepare an illustrated manual on using the equipment for a particular audience
- Observation of real or simulated professional practice

2.7. Managing and developing oneself

Managing and developing oneself includes working co-operatively, working independently, learning independently, being self-directed, managing time, managing tasks, organizing. These skills can be trained by activities such as:

- Journal reading
- Portfolio
- Learning contracts
- Group work

2.8. Accessing and managing information

Accessing and managing information includes researching, investigating, interpreting, organizing information, reviewing and paraphrasing information, collecting data, searching and managing information sources, observing, and interpreting. These skills can be trained by activities such as:

- Annotated bibliography
- Project work
- Dissertation
- Applied tasks
- Applied problems

2.9. Demonstrating knowledge and understanding

Demonstrating knowledge and understanding includes recalling, describing, reporting, recounting, recognizing, identifying, relating & interrelating. These skills can be trained by activities such as:

- Written examination
- Oral examination
- Essay
- Report
- Comment on the accuracy of a set of records
- Devise an encyclopedia entry
- Write an answer to a client's question

- Short answer questions: True/False/ Multiple Choice Questions (paper-based or computer-aided-assessment)

2.10. Designing, creating, performing

Designing, creating, performing includes imagining, visualizing, designing, producing, creating, innovating, performing. These skills can be trained by activities such as:

- Portfolio
- Performance
- Presentation
- Hypothetical Projects

2.11. Communicating

Communicating includes one and two-way communication; communication within a group, verbal, written, and non-verbal communication. Arguing, describing, advocating, interviewing, negotiating, presenting, using specific written forms. These skills can be trained by activities such as:

- Written presentation (essay, report, reflective paper, etc.)
- Oral presentation
- Group work
- Discussion/debate/role play
- Participate in a 'Court of Enquiry'
- Presentation to camera
- Observation of real or simulated professional practice

2.12. Evaluating practice

The evaluation provides an invaluable feedback loop (Hounsell, et al., 2006) that can inform course teams and individual lecturers about teaching, learning, and assessment that function exceptionally well or are not meeting staff and/or student expectations and/or needs (Figure 6). As shown by different studies, this is necessary given the disparities found between staff and students' perceptions of their everyday experience on learning, teaching and assessment processes (Crook, et al., 2006; Stefani, et al., 1997; Williams, 2005).

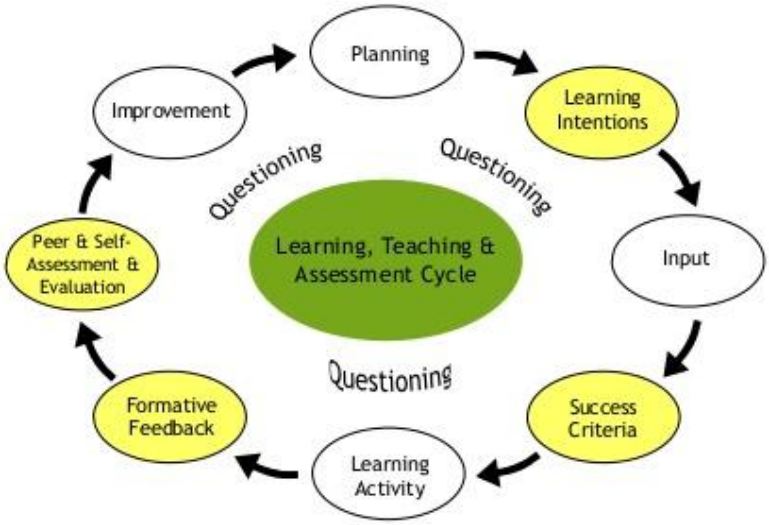

Figure 6. The assessment or evaluating practice cycle. PTT on the curriculum from Cambridge slide share resources.

There are three principal sources of feedback widely recognized in the evaluation of teaching:

1. Feedback from students
2. Feedback from teaching colleagues and professional peers, including external examiners
3. Self-generated feedback

To generate systematic and robust feedback, any developed strategy is likely to use at least two of these sources since each has its distinct advantages and limitations. For example, feedback from students offers direct access from the learner's perspective. Students are the best-qualified stakeholders to comment on matters such as clarity of presentation, pacing of materials, access to facilities, assessment methods, and helpful feedback. On the other hand, colleagues will be better equipped to comment on the appropriateness of course aims, content and structure, design, and provide alternatives for teaching methods and methods of assessments used. Finally, self-generated feedback is a valuable exercise to capitalize on things that work and change practices that, on the other hand, are contra-productive or do not work (Ramsden and Dodds, 1989).

2.13. Student feedback

Although a wide range of methods to get feedback can be deployed, the most common approach to evaluating courses and teaching remains the end-of-module students' questionnaires. These questionnaires can be combined with face-to-face discussion through a committee that brings together student and staff representatives. More sources of feedback include informal exchanges in

practical, tutorials, attendance levels, distribution patterns of grades, and the nature of students' choices in choosing between assignment topics.

As stated by Marsh and Roche (1993) and reviewed by Rowley (2003), the objectives for collecting student feedback should embrace one or more of the following:

- Diagnostic feedback to faculty that will be useful for the improvement of teaching
- A measure of teaching effectiveness to be used in personnel and administrative decision making
- Information for students to use in the selection of courses and teachers
- An outcome or a process description for research on teaching

Four additional objectives would seem to be equally if not more relevant:

- To provide auditable evidence that students' opportunities have been available for students to express their opinions on their courses and that the data collected inform action and quality enhancement.
- To encourage students to reflect on their learning, thereby enhancing their awareness of their learning processes and the factors that lead to positive or negative outcomes in such a way as to develop their learning competencies.
- To provide students, as customers, with an opportunity to express their level of satisfaction with a learning experience.
- To benchmark institutions and generate other indicators of quality that may contribute to the university's marketplace reputation.

The type of information collected into students' questionnaires is usually for summative evaluation and is therefore collected towards the end of a module or course.

Taking action on student feedback- When the data has been collected and analyzed, it is essential to share some part of the analysis. In this way, students can greatly benefit from knowing how the tutor will use the information and how their responses will be used as a guide for improving their skills as learners.

2.14. Peer feedback

Peer feedback capitalizes on a precious fact: academic peers have expertise and experience that would be highly relevant to improve current or new courses. Peer-review can cover the full range of teaching activities, including assessment, development of resources, curriculum design, laboratory, and field-based teaching. Thus, peer-review is an essential part of the evaluation of good teaching. Moreover,

peer-review encourages communication and collaboration. Historically, the term 'peer-review' of teaching has been limited to those situations when one colleague visits another colleague's classroom to evaluate teaching skills. However, the peer-review can be tailored to address other kinds of review activities, such as critiquing a syllabus and course materials.

The following five aspects of teaching can provide a useful framework from which to develop criteria for consideration during peer-review:

1. Approaches to teaching that influence, motivate, and inspire students to learn
2. Development of curricula and resources that reflect a command on the field
3. Approaches to assessment and feedback that foster independent learning
4. Respect and support for the development of students as individuals
5. Scholarly activities that have influenced and enhanced learning and teaching.

Peer feedback can be designed to review course materials and syllabi. Some of the questions here can be taken as suggestions: how well does the course appear to work as a whole? Does the course reflect the standards set overall by the departments and also, more importantly, sector-wide; how well do the module objectives fit within the overall programme of study? Are assignments appropriate to the module goals and the students who take the module?

Peer feedback can also be gathered through classroom observations. Classroom observations by a colleague can be a valuable source of information both for developmental and evaluation purposes. It is recommended that the observation is preceded by a consultation with the staff member being observed so that the reviewer has a clear sense of the type of observations that should be collected. It is also necessary that the observer is informed about the objectives of the course and class session. Therefore, it is recommended that there is a meeting before the review so that the reviewer can explain the teaching context and explain the aims of the session. It also can be used as an opportunity to discuss the criteria that will be most useful and relevant, and that will be used during the class observation.

A combination of both verbal and written feedback is recommended after the classroom observation. The verbal feedback provides valuable discussion, while written reports ensure that the reviewer has a record and can reflect further on the session.

Typical questions addressed via classroom observation concern the session's design, presentation, and clarity of the material, command of the subject matter, level of engagement displayed by both the teaching staff and the students.

Although it can be daunting for teaching staff to have peers doing class observations, this process should be seen as part of the development process of any course as the purpose should be to assist the improvement of teaching.

References

Allen, D. and Tanner, K., 2003. Approaches to cell biology teaching: learning content in context--problem-based learning. Cell biology education. 2, 73-81.

Barnett, R., 2003. Beyond All Reason: Living with Ideology in the University. Society for Research into Higher Education & Open University Press, London.

Biggs, J. and Tang, C., 2011. Teaching for Quality Learning at University. UK Open University Press, Maidenhead.

Bloom, B., 1956. Taxonomy of Educational Objectives - Book 1 David McKay, New York.

Bonney, K.M., 2015. Case study teaching method improves student performance and perceptions of learning gains. Journal of microbiology & biology education. 16, 21-28.

Chang, Y. and Brickman, P., 2018. When Group Work Doesn't Work: Insights from Students. CBE life sciences education. 17, ar42-ar42.

Cowan, J. and Harding, A.G., 1986. A Logical Model for Curriculum Development. 17, 103-109.

Crook, C., et al., 2006. Assessment relationships in higher education: the tension of process and practice. 32, 95-114.

Fairweather, J., 2008. Linking Evidence and Promising Practices in Science, Technology, Engineering, and Mathematics (STEM). Board of Science Education, Washington DC.

Frederick, P.J., 1986. The Lively Lecture: 8 Variations. College Teaching. 34, 43-50.

Freeman, S., et al., 2014. Active learning increases student performance in science, engineering, and mathematics. Proceedings of the National Academy of Sciences. 111, 8410-8415.

Fry, H.K., Steve; Marshall, Stephanie, 1999. A handbook for teaching and learning in higher education. Routledge, tyler and Francis Group, New York and London.

Giannakos, M., et al., 2014. Reviewing the Flipped Classroom Research: Reflections for Computer Science Education.

Hammar Chiriac, E., 2014. Group work as an incentive for learning - students' experiences of group work. Frontiers in psychology. 5, 558-558.

Harvey, L. and Green, D., 1993. Defining Quality. Assessment & Evaluation in Higher Education. 18, 9-34.

Hattie, J. and Timperley, H., 2007. The Power of Feedback. Review of Educational Research. 77, 81-112.

Haverhals, B., 2007. The normative foundations of research-based education: Philosophical notes on the transformation of the modern university idea. Studies in Philosophy and Education. 26, 419-432.

Hillage, J. and Pollard, E., 1998. Employability: Developing a framework for policy analysis. Department for Education and Employment.

Hmelo-Silver, C.E., 2004. Problem-Based Learning: What and How Do Students Learn? Educational Psychology Review. 16, 235-266.

Hounsell, D., et al., 2006. The quality of guidance and feedback to students, 3rd Biennial Northumbria/European Association for Research on Learning and Instruction, County Durham.

Huet, I., 2018. Research-based education as a model to change the teaching and learning environment in STEM disciplines. European Journal of Engineering Education. 43, 725-740.

Knight, P., 2001. A briefing on key concepts: formative and summative, criterion and norm-referenced assessment. Learning and Teaching Support Network, York.

Li, M.-C. and Tsai, C.-C., 2013. Game-Based Learning in Science Education: A Review of Relevant Research. Journal of Science Education and Technology. 22, 877-898.

Marsh, H.W. and Roche, L., 1993. The Use of Students' Evaluations and an Individually Structured Intervention to Enhance University Teaching Effectiveness. American Educational Research Journal. 30, 217-251.

Mathias, A., 2014. ACTIVE LEARNING IN THE SCIENCE CLASSROOM. Honors Projects. 113.

Matthews, M., 2012. Constructivism in science education, 2ed. Springer Science & Business Media.

McConnell, D., 1994. Implementing Computer Supported Co-operative Learning. Kogan, London.

Newman, J.H., 2010. Discourses on the Scope and Nature of University Education: Addressed to the Catholics of Dublin. Cambridge University press, Dublin.

Nightingale, D., et al., 1996. Assessing Learning in Universities. Assessing Learning in Universities, University of New South Wales Sydney.

Penner, J.G., 1984. Why many college teachers connot lecture, Springfield.

Piaget, J., 1976. Piaget's Theory. in: Inhelder, B., Chipman, H.H., Zwingmann, C. (Eds.), Piaget and His School: A Reader in Developmental Psychology. Springer Berlin Heidelberg, Berlin, Heidelberg, pp. 11-23.

Pool, L.D. and Sewell, P., 2007. The key to employability: developing a practical model of graduate employability. Education + Training. 49, 277-289.

Prince, M., 2004. Does Active Learning Work? A Review of the Research. Journal of Engineering Education. 93, 223-231.

QAA, 2018. UK QUALITY CODE, ADVICE AND GUIDANCE: ASSESSMENT. UK Standing Committee for Quality Assessment.

Ramsden, P., 2003. Learning in Higher Education. RoutledgeFalmer Tylor and Francis Group, Abingdon, Oxon.

Ramsden, P. and Dodds, A., 1989. Improving Teaching and Courses: A guide to evaluation, 2nd ed. University of Melbourne, Melbourne.

Rowley, J., 2003. Designing student feedback questionnaires. 11, 142-149.

Small, L., et al., 2018. Employability: a contemporary review for higher education stakeholders. Journal of Vocational Education & Training. 70, 148-166.

Stefani, L.A.J., et al., 1997. A Comparison of Tutor and Student Conceptions of Undergraduate Research Project Work. Assessment & Evaluation in Higher Education. 22, 271-288.

Williams, K., 2005. Lecturer and first year student (mis)understandings of assessment task verbs: 'Mind the gap'. Teaching in Higher Education. 10, 157-173.

Appendix

Example of a developed course with course outline and learning outcommes:

ASIAN INSTITUTE OF TECHNOLOGY
SCHOOL OF ENVIRONMENT, RESOURCES AND DEVELOPMENT

ED71.xx Selected topics: Sustainable Sea Food Business 2(2-0)
Semester: January

Course Objective: Seafood products are highly traded items in both the local and global markets. Seafood production, processing and trading have been highly commercial and globalized activities, which have resulted in a competition tougher than before. More recently, regulatory requirements are becoming stricter and often more complex. This course provides students with practical Seafood business management tools in the production, processing, quality control, and marketing of Seafood products in both the local and global markets to ensure the long-run sustainability of seafood production.

Learning Outcomes:

On completion of this course, students will be able to:

- identify suitable types of Seafood products for business
- explore the local and international markets for aquatic products
- apply seafood safety measures and certification processes
- carry out cost-benefit analysis of Seafood business
- develop a business plan for start-up seafood business

Pre-requisite: None

Course Outline:

I. Introduction

1. Scope of seafood business
2. Feeding the world in 2050 & trends in food supply chains
3. Entrepreneurship in seafood industry
4. Seafood products (live, fresh and processed fish)
5. International seafood trade

II. Context of Seafood Business

1. Financial resources and institutions
2. Inputs and technical support services
3. Research and development
4. National and international food safety standards and hygiene requirements

III. Clients, Consumers and Product Development

1. Markets: domestic and international
2. Consumer behavior and expectations
3. Food crisis, customers' food scares

4. New product development and deployment

IV. Certification and Industry Standards

1. Principles of certification
2. Certification *vs.* branding
3. Overview of major families of standards
4. Organic Seafood standards
5. Fair trade standards and traceability
6. Industry standards (ASC, MSC, GLOBALGAP etc.)
7. ISO standards (ISO 9000, 14001, 22000)

V. Cost-Benefit Analysis

1. Cost, revenue, gross margin, and net profit
2. Partial budgeting of seafood businesses
3. Benefit-cost ratio
4. NPV, IRR, Payback period etc.
5. Decision making / choosing the right businesses

VI. Planning and Management of Seafood Business

1. Business plan development
2. Human resource management and team building
3. Management of cooperative/contract farming (clusters, farmers groups etc.)
4. Implementation phases
5. Regular monitoring and evaluation plan
6. Lessons learned and continuous improvement
7. Expansion and growth

Laboratory Session:

1. Sensory testing of seafood items
2. Microbial testing of seafood items

Field visits:

1. Fish farms – Sea bass, Tilapia, Shrimp etc.
2. Seafood processing factory
3. Fish markets - fish landing site, traditional village and supermarket

Case studies:

1. Tilapia hatchery business – Nam Sai Farms, Prachinburi
2. Shrimp farm – Sib Saen Farm, Chonburi
3. Sib Saen Farm – Chachoengsao, Province
4. Sea bass farming – Song Sawang Farm, Chacheongsao

Learning Resources:

Textbooks: No designated textbook, but lecture notes will be provided.

Reference Books:

1. Bhujel, R.C. 2014. A Manual for Tilapia Business Management. CABI Publishing. 216 p.

2. Engle, C. 2010. Seafoodculture Economics and Financing: Management and Analysis, Wiley-Blackwell. 272 p.
3. Leung, PS. and Engle, C.R. 2006. Shrimp Culture: Economics, Market, and Trade. Wiley-Blackwell. 335 p.
4. Washington, S., and Ababouch, L., 2011. Private standards and certification in fisheries and aquaculture. Current practice and emerging issues. FAO. 181 p.

Journal and Magazines:

1. Aquaculture economics: An overview, Springer
2. Aquaculture Economics & Management, Taylor & Francis
3. Global Aquaculture Advocate magazine, Global Aquaculture Alliance, USA
4. Aqua Culture Asia Pacific magazine, Corporate Media Services, Singapore
5. Aquaculture Magazine by World Aquaculture Society, USA
6. Aquaculture Asia by NACA, Bangkok

Teaching and Learning Methods: Lectures, field visits, case studies and presentations (description attached)

Time Distribution and Study Load:

Lecture hours = 15 h.
Field visits = 8 hrs x 3 days
Case study assignments = 8 h. (1 day)
Self-studies = 50 h.

Evaluation Scheme:

Case Study report and presentation 1 = 20%; Case Study report and presentation 2 (Trip) = 20%; Mid-semester examination = 20%; and Final examination = 40%.

Students who display a thorough knowledge on aquaculture business management during the examinations and show excellent analytical skills in evaluating case study reports (written report + presentations) are given an A grade, and those who display a good understanding and analytical skills are given a B grade. Grade C will be awarded for those who show below average knowledge and analytical skills on the subject matter, and the grade D will be given to students who show poor understanding/ analytical skills on the subject matters.

Instructor: Dr Ram C. Bhujel

School Recommendation: _____ ADRC Approval: _____

Academic Senate Approval: _____

Annexes:
(Select only which you are going to use)

1. **Needs Assessment**:
   One-page form to be developed and given to students on the first introductory class

2. **Lectures** – lecture notes, 2 hours each, PDF file of the lectures and also reference materials to be provided in advance via online / VLE system

3. **Group discussions**
   - Topic / issues / problems
   - Group plan
   - Date and venue
   - Presentation & Report

4. **Videos**
   Title of the videos, where and how long

5. **Laboratory work** – a lab manual with clear learning objectives to be prepared and provided to the students.
   - Methodology
   - List of equipment, materials and chemicals
   - Reports to be submitted by students (format with deadline)

6. **Field visit / study tours:** Fish farm, Seafood market and processing
   One-page description with the followings:
   - Background
   - Objectives
   - Date and transportation details with do's and don'ts
   - Report with deadline
   - Presentation (date and format)

7. **Internship / field work**
   Full description of the program with the followings:
   - Background and objectives
   - Date and transportation/residences details with do's and don'ts
   - Report (weekly) with deadline and final
   - Presentation (date and format)

8. **Case studies**
   One-page description with the followings:
   - Background description
   - Objectives
   - Report and presentation

9. Evaluation and Feedback -

An evaluation form to be developed to give to the students to get feedback. Scoring methods for each chapter and teaching methods etc, and also open questions can be included what they like the most, what they did not like and what are missing.