

Skills Labs

Hoogwaardige e-practica Water Management met EMERGO

Deliverable 2.3.a

Casusidee Aquaculture: Volkerak-Zoommeer

Auteur:

Jasper van Houcke, Pieter Vollaard, Jouke Heringa, Jaap Holstein

Skills Labs penvoerende instelling:

Open Universiteit Nederland

- CELSTEC (Centrum voor Leertheorie en Technologieën)
- Faculteit Natuurwetenschappen
- Faculteit Managementwetenschappen

Skills Labs partner instellingen:

Hogeschool Zeeland

Kennis Netwerk Delta Water (KNDW)

(Provincie Zeeland, Delta, de Waterschappen, Roosevelt Academy, NIOO-Nederlands Instituut voor Ecologie, Rijkswaterstaat, Deltares en Wageningen Universiteit en Researchcentrum)

Datum: 30 november 2008

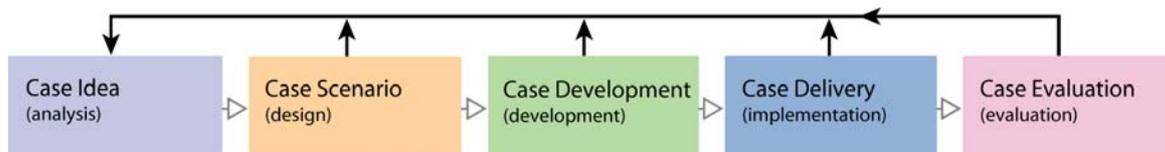
Versie 1.0

Kenmerk: U2008/6943

1. Inleiding

Met de in het Surf-project EMERGO ontwikkelde deliverable 1.4.b kunnen de casusontwikkelaars bij Skills Labs vertrouwd raken met de EMERGO-methodiek (zie Figuur 1). Daarnaast worden er vanuit WP 3 een aantal workshops georganiseerd waarin casusontwikkelaars worden begeleid in het toepassen van de EMERGO-methodiek. De basisgedachte is dat via de workshops casusontwikkeling efficiënter en effectiever verloopt. Daarnaast zullen casusontwikkelaars – in het kader van de disseminatie-activiteiten tijdens het Skills Labs project - ook als ambassadeurs binnen hun instelling optreden ('zegt het voort'). Dit is de tweede functie van de workshops. Last, but not least, via workshops kan de teamvorming binnen Skills Labs mede worden vormgegeven.

De deliverables bij de casussen voor Skills Labs zijn achtereenvolgens casusidee, casusframework, testversie casus, en evaluatieversie casus. Bij het doorlopen van de EMERGO-methodiek en het gebruik van de EMERGO-toolkit worden als tussenproducten onderscheiden: casusidee (fase analysis), casusframework (fase design), casusingrediëntenverhaal (fase design), casusdetailscenario (fase design), testversie casus (fase development), en evaluatieversie casus (fases implementation en evaluation). Zoals blijkt is bij Skills Labs niet elk mogelijk tussenproduct als deliverable gedefinieerd.



Figuur 1. Methodiek voor casusontwikkeling: van casusidee tot casusevaluatie

De open pijlen geven een geadviseerde volgorde van doorlopen aan. De fasen kunnen bovendien iteratief (gesloten pijlen) worden doorlopen.

Deze eerste deliverable bij de casus *Aquaculture: Volkerak-Zoommeer* betreft het casusidee. We beschrijven eerst kort wat een casusidee is en hoe we binnen Skills Labs de uitwerking van het casusidee *Aquaculture: Volkerak-Zoommeer* ter hand hebben genomen.

Casusidee

Voordat de casusontwikkelaars beginnen met het concrete ontwerp- en ontwikkelwerk, is vanuit WP3 gevraagd aan hen om na te denken over uiteenlopende zaken die direct en indirect verband houden met de te ontwikkelen casus. Daarbij gaat het om zaken als:

- opleidingscontext van de casus
- inhoud van de casus
- voortgang in de casus
- studentcontact en studenteninformatie in de casus
- mediagebruik in de casus
- uitleverproces van de casus
- ondersteuning van de casus
- exploitatiekosten van de casus
- rechten en intellectueel eigendom met betrekking tot de casus.

Door diverse malen met elkaar te spreken over deze zaken aan de hand van concrete vragen wordt het projectteam zich nadrukkelijker bewust van het voor wie, wat, waarom en hoe van de casus

(context). Een en ander leidt al vroeg in het ontwikkeltraject tot een realistisch(er) beeld van de mogelijkheden en beperkingen waarmee het team rekening te houden heeft. Mede aan de hand van de antwoorden op deze vragen kan het team een *globale beschrijving* van de casus maken: het casusidee.

In Appendix 1 is een leeg casusidee opgenomen dat als richtsnoer/checklist een opsomming van concrete vragen bevat. Het is dus niet zo dat altijd alle vragen in gelijke mate beantwoord moeten worden. Daarnaast heeft het casusontwikkelteam een uitgewerkt voorbeeld van een in het EMERGO-project ontwikkelde casus (de Waddenzee) gekregen en is een light versie van de checklist als tussenstap gebruikt om tot een definitieve versie van het casusidee te komen. Overigens, het casusidee kan – gegeven de iteratieslagen in de EMERGO-methodiek – bij nadere uitwerking nog tot op zekere hoogte bijgesteld worden. Deze flexibiliteit is nodig om op veranderende contextuele aspecten te kunnen inspelen (bijvoorbeeld: curriculumwijziging, (on)beschikbaarheid van bronnenmaterialen, expertconsultatie).

2. Casusidee Aquaculture: Volkerak-Zoommeer

Hieronder volgt de uitwerking van het casusidee voor de casus *Aquaculture: Volkerak-Zoommeer*. Bij de vervolgstappen van de casusuitwerking zal steeds meer “letterlijke” inhoud van de uit te leveren casus in de casusuitwerking aanwezig zijn. Omdat de casus in het Engels aan studenten zal worden uitgeleverd, is besloten de casusontwikkeling eveneens in het Engels te doen. Het casusidee is dus in het Engels uitgewerkt.

Subject	Questions & Answers
Case embedding	<p>Q1: For which courses, curricula and institutions will it be used? A1: This case will be one of four cases within the Skills Labs Water Management project. Each of the four cases covers other parts of the field Delta Water Management. These parts together will cover the “water management” competence (exploration > investigation > ‘setting the course’/intervention) (ref: rapport Beroepenveldconsultatie). In each casus selective subdomains of the domain Delta Water Management and selective parts of the water management competence will be trained. The four cases in total will cover the diverse aspects of this competence. The four cases to be developed within this SURF Skills Labs project are: ‘The Scheldt – Estuarine Systems’; ‘Water Governance – Perkpolder’; ‘Volkerak – Zoommeer - Aquaculture’; and ‘Volkerak – Zoommeer - Building with Nature’. This case will be embedded within the Master (MSc) Deltawater Management (Hogeschool Zeeland). This program (120 ECTS) is accessible for both β and γ students holding a relevant Bachelor’s degree. Since the actual start of the Master has been postponed, the scheduled trail run of the case ‘Volkerak – Zoommeer – Aquaculture’ will be performed with Bachelor of Water Management students (Hogeschool Zeeland). Most likely the case will also be incorporated in the specialization Aquatic Production of the above mentioned Bachelor of Water Management program. Other institutes might use the case as well, possibly in a f2f-setting where groups of students work together on the case, in an atmosphere open for discussion and reflection.</p>
	<p>Q2: Is it a stand-alone item or used with other instructional materials? A2: It is a stand-alone item. Considering the accessibility in the above mentioned MSc-program is quite broad and the relative newness of the theme aquaculture, one can expect that the majority of the students have limited to no background knowledge. A small introduction to the theme will therefore be incorporated within the case material.</p>
	<p>Q3: What study load and time interval is expected? A3: We expect that studying this case takes about 20 hours of study load (SBU: StudieBelastingsUren). Depending on individual time available, a time interval of two weeks should be doable for most students.</p>
	<p>Q4: How many credit points earn students by successfully completing it? A4: Based on the study load of 20 hours per case, each of the four cases accounts for approximately 0.75 EC (European Credit). The total for all four cases will add up to approximately 3 EC. (28 hours of study load account for 1 EC)</p>
Case content	<p>Q5: What is the main complex cognitive skill? A5: The main cognitive skills deal with analyzing a complex issue related to multiple disciplines: natural science, governance, technology and economics.</p>
	<p>Q6: Do other complex cognitive (sub) skills need to be acquired? A6: Other relevant (sub)skills to acquire deals with explaining their method and results to other β and γ students (peers) within the case setting.</p>
	<p>Q7: What subject matter domain(s) are involved? A7: The case ‘Volkerak – Zoommeer - Aquaculture’ consists of two different trajectories, where respectively governance and natural science are considered the main domains. The umbrella competences are focused on multidisciplinary</p>
	<p>Q8: What prior knowledge and skills are expected for enrolled students? A8: The MSc Deltawater Management (Hogeschool Zeeland) is accessible for both β and γ students holding a relevant Bachelor’s degree. There are no further enrolment requirements for this specific case.</p>
	<p>Q9: What is central to the case (for example: patient, equipment, process)? A9: Central to the case is either an analysis of a near-by future process or a commonly accepted analysis applied in a new setting, depending on the chosen trajectory.</p>
	<p>Q10: What are physical locations in the case? (try to map them to virtual spaces) A10: The student can start by visiting a virtual classroom where a short introduction on the theme aquaculture will be presented by an virtual teacher. Other sources on this theme could also be found in this location. Furthermore there will be more locations where sources can be found, experts can be consulted and the location can be visited.</p>

	<p>Q11: What case characters (real persons, virtual persons) are relevant? A11: Of relevance are the student's own role, virtual teacher, various virtual experts, virtual stakeholders, the role of the real teacher and real peer students studying the same case.</p>
	<p>Q12: Do students need to proceed via a stepwise procedure? A12: Yes, the case-scenario will be based on a structured narrative, where the student will be given stepwise instruction by the coach (virtual and real teacher). After each step the environment will contain different resources and tools, progress on each step will be assessed.</p>
	<p>Q13: What kind of activities do students need to perform for acquiring the main complex cognitive skill? A13: Students will perform various activities, using a rich variety of resources and tools, including attending a presentation, studying written reports, consultation with experts, interviews with stakeholders, looking at documentaries or news, making notes, writing reports, discussing outcomes with peers and/or teacher.</p>
	<p>Q14: Is there a strict order for the compulsory tasks? A14: No, except for the (short) introduction on the theme aquaculture at the start of the case.</p>
	<p>Q15: Are there compulsory tasks, non-compulsory tasks and what determines this? A15: There will be a compulsory test on the introduction (can be done without following the introduction presentation and additional reading), there will be a compulsory half-way monitoring and there will be a compulsory end report which each student has to submit after studying the case, but furthermore students are at liberty to neglect feedback provided in the program (both positive and negative).</p>
	<p>Q16: Is redundant information provided, or is everything strictly needed? A16: The case addresses an authentic problem, meaning that it is ill-defined, at times contains distracting and useless information and unexpected events (like in reality). It is for the student to decide what is relevant or most useful (part of the competence involved).</p>
	<p>Q17: How realistic and authentic is the case? A17: Even though the actual case has a virtual setting (near-by future), the actual problem addressed in the case is a realistic one. Most resources are derived from reality (e.g. experts) or directly taken from reality (e.g. recorded news), so it was made as real as required. One will have to take into account that the feasibility within the MSc-program and the timeframe is limited.</p>
	<p>Q18: If students can redo a case: will this be the same case or a variant? A18: No, even though there are two different trajectories defined within the case, the student can only follow one trajectory (based on their background knowledge and personal interest).</p>
	<p>Q19: Can students undo former decisions? A19: No. only when this is part of the case-scenario (e.g., they can re-submit a task till it meets the required criteria before proceeding with the next step).</p>
	<p>Q20: Are different learning routes and tasks for different students offered? A20: Yes, within the case two different trajectories are defined. One will focus on the domain of natural science and another will focus on the domain of governance. However, learning routes within the different trajectories does depend on individual decisions taken.</p>
	<p>Q21: What kind of cooperation is needed by students? A21: Students can help one another both IN and BETWEEN the two different trajectories by giving hints and advice within the program. Since user-generated content will/can be used within the case an explanation on this content could be necessary.</p>
	<p>Q22: Do students have different case characters? A22: Yes, depending on the chosen trajectory. The role of the student in the natural science trajectory will be a employee/trainee of a research institute., whereas the role of the student within the governance trajectory will be that of a employee/trainee of the Province Zeeland. All students start with the role of student for the first part (introduction aquaculture) of the case.</p>
	<p>Q23: Do students have active roles? A23: Students need to take several decisions and need to perform various activities in order to be able to finish a step successfully. This makes them a rather active participant instead of an inactive spectator.</p>

	<p>Q24: Do teachers have active roles? A24: This depends on the quality of the report send. Teachers do actively monitor all progress, and may decide to actively provide feedback if the quality of progress and reports is too poor, cannot be handled by automated feedback and needs manual input.</p>
	<p>Q25: What aspects induce and sustain interest and motivation? A25: Various design measures will be taken to warrant sufficient interest and motivation, including identification with the student role and responsibility (helping others, being supported and assessed by teacher), gaining knowledge that is highly authentic and implicit, having rich resources available that make the course lively, introducing interactivity and gaming elements (like unexpected, real-life events) that raise the awareness of actually being involved and awareness of presence of other students (overview of their progress).</p>
	<p>Q26: What unforeseen circumstances are incorporated? A26: Unforeseen circumstances still have to be worked out but can for instance be that an expert has ran out of time for consultation, that parameters used in a prior report now seem to have been outdated, political change, new report, et cetera.</p>
	<p>Q27: Is competition incorporated? How do students get rewarded for excellent performance or behaviour? A27: No, currently it is only envisioned that students can see each others progress. They will not be rewarded or punished for their ranking. The teacher might ask students to compare their report with that of another.</p>
Students' progress	<p>Q28: How do students discover not yet having acquired the main complex cognitive skill? A28: The task list provides an overview of tasks to be carried out for each case, including an estimation of time for each task. So time wise they can monitor amount of study time passed and ahead. To assess progress on each step (usually a collection of some tasks) students will be provided with automated feedback (provided by coach, or by partial worked out examples). Each report has to be accepted by the teacher.</p>
	<p>Q29: How can students monitor their progress? A29: Ibid. The task list provides an overview of tasks to be carried out for each case, including an estimation of time for each task. So time wise they can monitor amount of study time passed and ahead. To assess progress on each step (usually a collection of some tasks) students will be provided with automated feedback (provided by coach, or by partial worked out examples). Each report has to be accepted by the teacher. Furthermore, they can compare their progress with that of their peers.</p>
	<p>Q30: How is it checked if students have acquired the main complex cognitive skill? A30: Teacher will assess the final reports send in. There is a list of assessment criteria available, focusing on content but also structure, source annotation, use of language, etc. Furthermore we have (good and bad) worked out examples of reports available for comparison.</p>
	<p>Q31: Is summative assessment included and are its results used in formative assessment? A31: No there is no summative assessment included. The introduction test on the theme aquaculture is marked as 'passed' or 'not passed', in order to advance through the case a 'passed' is required. The only formal assessment will be the final case report.</p>
	<p>Q32: Which students' progress figures are to be used by teachers during run time? A32: Selected methods and models, reports send in, ...</p>
Contact with peers	<p>Q33: Should contact between students be encouraged? A33: Yes, if feasible interaction between students would be preferable. This both IN and BETWEEN the two (governance and natural science) different case trajectories. User-generated data from the different trajectories will also be available (output as input for other students).</p>
	<p>Q34: Should students see if peers are on line, when they have been on line? A34: We plan to make availability and progress of peers visible.</p>
	<p>Q35: Can students compare their progress with peers? A35: Ibid. We plan to make availability and progress op peers visible.</p>
Using media	<p>Q36: Will existing material be used, is new material needed? A36: When possible, we will try to acquire existing material. Feasibility depends on the acquisition costs for external resources, whether we can use external linking, et cetera. New material (mainly video) will be needed to record some of the virtual actors (interview experts et cetera.). All kinds of</p>

	<p>multimedia will be used.</p> <p>Q37: What media genres are used (e.g., interviews, docudrama, movie, animations)?</p> <p>A37: All kinds of multimedia will be used.</p> <p>Q38: What media assets are needed and what are their costs?</p> <p>A38: Aside from video, no other media assets (music, animations, et cetera) are needed.</p>
Case delivery	<p>Q39: Is the number of students within one run restricted?</p> <p>A39: There are no restrictions on the amount of students, although large groups will hamper performance and limit guidance (teacher bandwidth problem).</p> <p>Q40: When can students enrol for a run?</p> <p>A40: Enrolment could be as flexible as possible. When not so, cohorts of students can start enrolling at more fixed intervals. Depended on the available timeslots within the MSc-program.</p> <p>Q41: Is it possible to change the case after starting a run?</p> <p>A42: No, this is not possible. User-generated content during a run evidently will change the case.</p>
(embedded) Support	<p>Q42: How will technical support be provided?</p> <p>A42: Technical support will be provided by a super user at the Hogeschool Zeeland. Training super users for each participating institute is an explicit target defined in the project.</p> <p>Q43: How will support be provided for acquiring the main complex cognitive skill?</p> <p>A43: See above as well. Virtual teacher will provide partial worked examples, and real teacher will monitor progress half-way, provide feedback when needed and assesses reports sent.</p>
Costs	<p>Q44: How many students will enrol each year?</p> <p>A44: The first trail run will be with 10 students. For reasons of quality assurance, the total number of participants in the MSc program is restricted to an annual admission of 50. The students might be divided into smaller groups, based on the available timeslots within the MSc-program.</p> <p>Q45: What are the development costs per student?</p> <p>A45: The expected costs of case development are incorporated in SURF Skills Project, including the costs of 10 students in the trial run. Based on a production ratio of about 1:25, development costs of about €75 an hour, foreseen number of future students (around 200) plus some additional costs, each case of 15 hours will cost around $25 \cdot 15 \cdot 75 + X = \text{€}30.000/200 = \text{€}140$. The expected cost on exploitation of the case are incorporated in the regular cost in exploitation in the educational setting the case is offered (MSc Deltawater Management).</p> <p>Q46: What is the expected teacher/student ratio during exploitation?</p> <p>A47: Hard to estimate, but we think it should be doable for each teacher to monitor 50 students.</p>
IPR	<p>Q47: Is it allowed for others to use the case?</p> <p>A48: All EMERGO products, including cases, are freely available and adjustable as Open Source software under Creative Commons license. In practice it will be hard to use the cases without accompanying services and course materials though.</p> <p>Q48: Are materials from other parties incorporated and what are their Intellectual Property Rights(IPR) arrangements?</p> <p>A48: Has to be decided, but all IPR for contributing partners in development of the case will be brought under a SURF license based on Creative Commons. Others, not being project partners can sublicense via SURF.</p>

Appendix 1 - Template global description / case idea: "XXX"

Introduction

Case developers first need to consider various issues related to the intended case. By discussing them, the project team gains more insight, common ground and awareness: why is the case needed, for whom is it meant, how will it be placed in the curriculum, what are the (learning) objectives, what content and media will be needed, how will it be structured, how will progress be monitored, a.s.o.? A realistic picture of possibilities and impossibilities has to emerge before actually starting case design and development using the EMERGO toolkit. By answering – could be an appropriate subset of - the questions in the table, the case team provides a *global description* of the intended case as input document for the design phase. Case designers will then continue by working-out a framework scenario.

Subject	Questions & Answers
Case embedding	Q1: For which courses, curricula and institutions will it be used? A1:
	Q2: Is it a stand-alone item or used with other instructional materials? A2:
	Q3: What study load and time interval is expected? A3:
	Q4: How many credit points earn students by successfully completing it? A4:
Case content	Q5: What is the main complex cognitive skill? A5:
	Q6: Do other complex cognitive (sub) skills need to be acquired? A6:
	Q7: What subject matter domain(s) are involved? A7:
	Q8: What prior knowledge and skills are expected for enrolled students? A8:
	Q9: What is central to the case (for example: patient, equipment, process)? A9:
	Q10: What are physical locations in the case? (try to map them to virtual spaces) A10:
	Q11: What case characters (real persons, virtual persons) are relevant? A11:
	Q12: Do students need to proceed via a stepwise procedure? A12:
	Q13: What kind of activities do students need to perform for acquiring the main complex cognitive skill? A13:

	Q14: Is there a strict order for the compulsory tasks? A14:
	Q15: Are there compulsory tasks, non-compulsory tasks and what determines this? Q15:
	Q16: Is redundant information provided, or is everything strictly needed? Q16:
	Q17: How realistic and authentic is the case? A17:
	Q18: If students can redo a case: will this be the same case or a variant? A18:
	Q19: Can students undo former decisions? A19:
	Q20: Are different learning routes and tasks for different students offered? A20:
	Q21: What kind of cooperation is needed by students? A21:
	Q22: Do students have different case characters? A22:
	Q23: Do students have active roles? A23:
	Q24: Do teachers have active roles? A24:
	Q25: What aspects induce and sustain interest and motivation? A25:
	Q26: What unforeseen circumstances are incorporated? A26:
	Q27: Is competition incorporated? How do students get rewarded for excellent performance or behaviour? A27:
Students' progress	Q28: How do students discover not yet having acquired the main complex cognitive skill? A28:
	Q29: How can students monitor their progress? A29:
	Q30: How is it checked if students have acquired the main complex cognitive skill? A30:
	Q31: Is summative assessment included and are its results used in formative assessment? A31:
	Q32: Which students' progress figures are to be used by teachers during run time? A32:
Contact with peers	Q33: Should contact between students be encouraged? A33:

	Q34: Should students see if peers are on line, when they have been on line? A34:
	Q35: Can students compare their progress with peers? A35:
Using media	Q36: Will existing material be used, is new material needed? A36:
	Q37: What media genres are used (e.g., interviews, docudrama, movie, animations)? A37:
	Q38: What media assets are needed and what are their costs? A38:
Case delivery	Q39: Is the number of students within one run restricted? A39:
	Q40: When can students enrol for a run? A40:
	Q41: Is it possible to change the case after starting a run? A42:
(embedded) Support	Q42: How will technical support be provided? A42:
	Q43: How will support be provided for acquiring the main complex cognitive skill? A43:
Costs	Q44: How many students will enrol each year? A44:
	Q45: What are the development costs per student? A45:
	Q46: What is the expected teacher/student ratio during exploitation? A47:
IPR	Q47: Is it allowed for others to use the case? A48:
	Q48: Are materials from other parties incorporated and what are their Intellectual Property Rights(IPR) arrangements? A48: