The Third International Syposium on the Formation of Ethics Crossroads and the Construction of Science and Engineering Ethics: Research Outcomes

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# Introduction of an E-Learning System, "Agora"

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### What is Agora?

Delft University of Technology

An E-learning system for SEEE<sup>\*</sup> \*Science and Engineering Ethics Education <http://www.ethiekentechniek.nl/> • Developed by three Dutch Tech. Univs. Now operated by recently established Centre for Ethics and Technology TU/e **TU**Delft

Centre for Ethics and Technology

# KIT's involvement in Agora

### As a Special Partner . . .

- Practically since 2005 when upgrade of the system (fm Agora 1 to Agora 2) started
   Provided opinions for adding multi-language support capabilities on Agora 2
   Implemented Japanese texts
   Tried to use Agora 2 (in Jap.) and gave feedback
   Officially since 2006 under official license
- agreement
  - ✓ Have tried to use Agora in classes



### What is required to SEEE

SEEE in engineering education . . .

Should not be merely theoretical

It should be practical

Be practical" means

 To cultivate students' / participants' ethical judgement ability Difficulties in fulfilling the requirement

SEEE to cultivate ethical judgement ability

### By how???

- Can we promote the ability in only 20 some lectures?
- Can we evaluate how much they improve the ability?

Even if possible, technically how do a few teachers effectively educe such ability from hundreds of students?

### Is it really possible?

In educational institutions,

w/o full-time teachers for SEEE,
 It could be possible if the goal were for form's sake.
 Difficult to imagine how to be rich in content

... if, say, 5 teachers teach 1,000 students?

w/ full-time teachers like at KIT,
 It IS possible, but . . .

### Practical difficulties: in the case of KIT

### Course "Science and Engineering Ethics"

- abt. 1500 students (compulsory for all Jrs.)
   ✓ 500 students per term
  - ✓ Divided in abt. 10 classes (abt. 50 students per class)
- 6 teachers
  - ✓5 teachers offer courses
  - Each in charge of 2 classes (abt. 100 students) per term = 300 students a year (plus other courses)

 Imagine that 6 teachers and 1500 students do...
 2 exams, 1 research paper, 1 mini quiz, 3 group discussions, 8 exercises (for 100 students in 2 classes)
 in 20 lectures (60 minutes per lecture)

## Is it really possible (cont.)

In educational institutions,
 w/o full-time teachers for SEEE,
 It could be possible if the goal were for form's sake.
 Difficult to imagine how to be rich in content
 w/ full-time teachers like us,
 It IS possible, but ....

In biz. enterprises and/or rsch. institutions,
 SEEE training / workshop
 Should NOT interfere their daily business / duties
 But, should be meaningful to the participants

←By how? and how about in reality?

# To mitigate the difficulties

### Introducing an E-learning tool to SEEE

E-learning is not a panacea
 "Video lecture" could be worse than nothing. . .
 \$\overline\$ So

# Q) What kind of an E-learning tool is desireble for SEEE?

A) It should be able to promote students' awareness of improving ethical judgement ability continuously by themselves

A) It should improve both teaching and learning efficiency

# Agora could satisfy the requirements How can we make SEEE be practical? • To introduce case analyses, ✓ SEEE could be more practical ✓ But, it could go into "how-to manual" type of SEEE In Agora, in order SEEE not only to be practical but to be beyond • A lot of case exercises w/ stuructred analysis method ✓ By analyzing cases by the method, students / participants could cultivate their ethical judgement ability.

### Structured analyses of cases

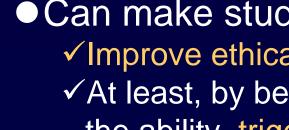
### Non-structured . . .

Recognize a case as either-or situation

Jump into conclusion emotionally

### Structured . . .

Step-by-step analyses of cases ✓ Prevent from deciding emotionally ✓ Sufficient analysis w/ various views



Can make students / participants ✓ Improve ethical judgement ability efficiently ✓ At least, by being aware of the necessity for improving the ability, trigger for continuous thinking about it

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### How is the analysis structured in Agora?

The analysis consits of seven steps<sup>\*</sup>

- $\Rightarrow$  The Seven-step Guide proposed by Michael Davis
- 1) Case description: to grasp the case
- 2) Problem statement: to state problem (step 1)
- 3) Problem analysis: to check facts (step 2), and to identify relevant factors (step 3)
- 4) Options for action: to develop list of options (step 4)
- 5) Ethical evaluation: to test oprions (step 5), and to make a tentative choice (step 6)
- 6) Reflection: to review the previous steps for ethical reflection (step 7)
- 7) Discussion: to discuss among students / participants \*Some steps consist of a few sub-steps

### Two parts in Agora

### Case analysis

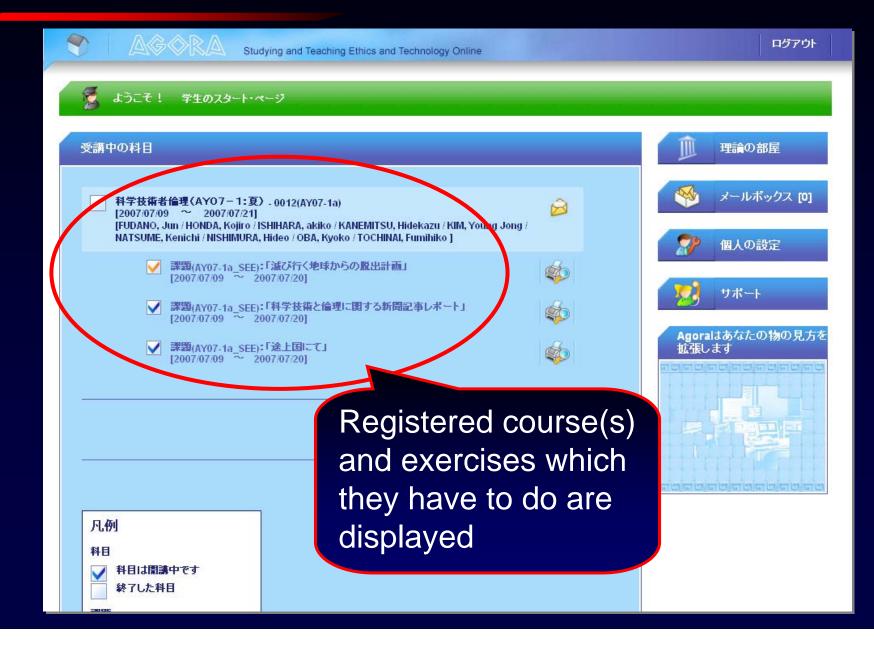
- Analyzing cases in structured way following the steps as exercises
- Any cases can be implemented
- Difficulty level of analyses can be set arbitarily

### "Theory Chambers"

To study ethical theories, etc. by themselves
Not adapted to Japanese

# Examples: How to study / How to teach in Agora

# Students: "Welcome" screen



### Students:to understand a case's structure

Studying and Teaching Ethics and Technology Online

ログアウト

記録

イントロダクシ

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概説	
	: 科学技術者倫理(A : 課題(AY07-1a_SE : DA, Kojiro / ISHIHARA, akik A, Hideo / OBA, Kyoko / TOC : Student_AY07-1, 1 : 2007/07/09 ~ . しいえ : 修正/訂正されてし : 0

#### Check "Introduction" tub to understand the case's structure

In this example, students understand that this exercise is to do the first three steps, "Case description," "Problem statement," and "Problem analysis. At the same time, students understand that this exercise aims to improve their analyzing skills of cases by highlighting stakeholders, interests, facts, lacking informations, and uncertain facts by looking at five sub-steps of the third step.

概説



### Students:to understand a case's structure

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概説	
	: 科学技術者倫理(AYO7-1:夏) : 課題(AYO7-1a_SEE):「途上国に : : Kojiro / ISHIHARA, akiko / KANEMIT lideo / OBA, Kyoko / TOCHINAI, Fumi : Student_AY07-1, 1003 : 2007/07/09 ~ 2007/07/20 : いいえ : 修正/訂正されていません : 0

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課題

概説

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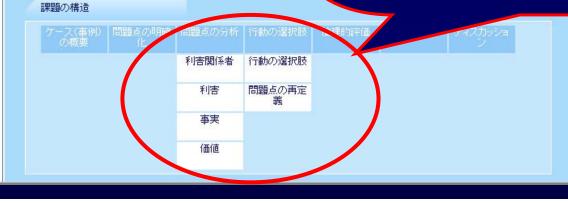
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#### Check "Introduction" tub to understand the case's structure

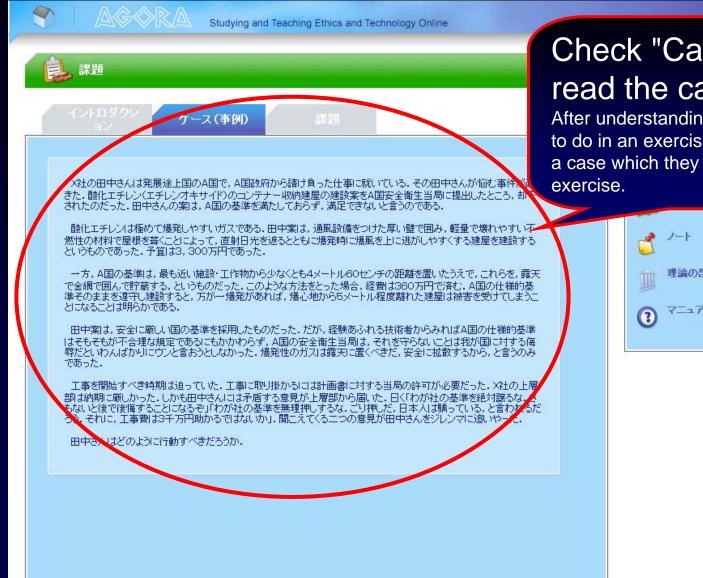
ログアウト

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This is an another example. In this exercise, students understand that this is to do the middle two steps, "Problem analysis" and "Options for action." Teachers can arbitrarily select which steps and/or substeps to use in an exercise to correspond to the purpose of the exercise and/or to adjust the exercise's difficulty level.



# Students: to read a case



#### Check "Case" tub to read the case

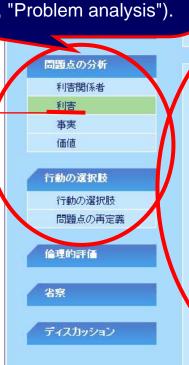
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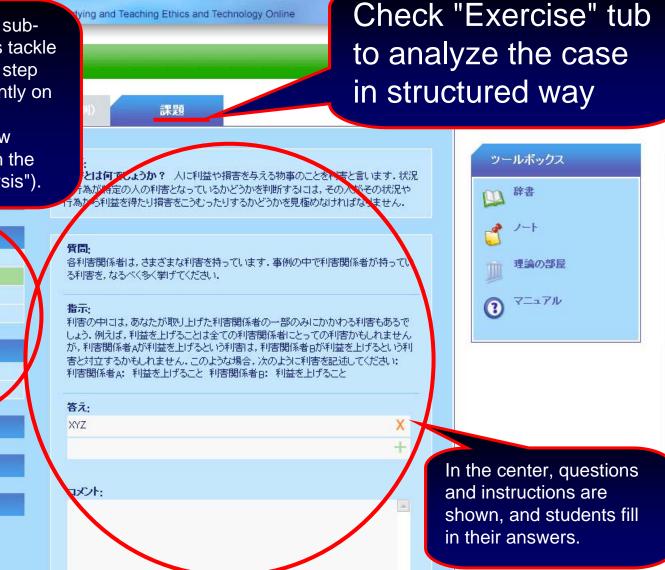
After understanding what they are to do in an exercise, students read a case which they analyze in the



### Students: to do stuructured analysis

In the left, steps and substeps which students tackle are shown. A (sub-) step which they are currently on is highlighted (in this example, (s)he is now analyzing interests in the step, "Problem analysis").

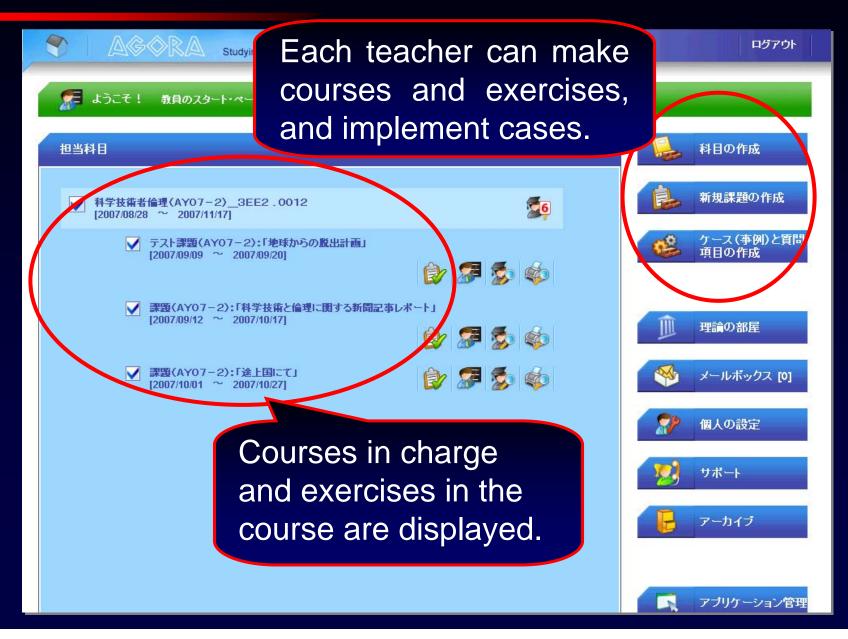


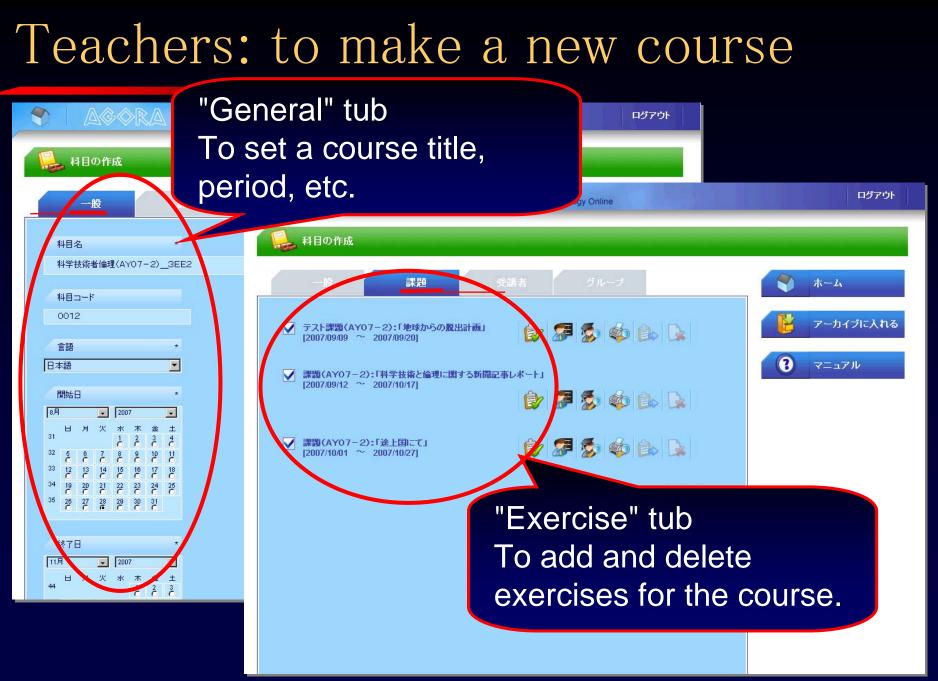


# Students: to rcv. feedback for reflection

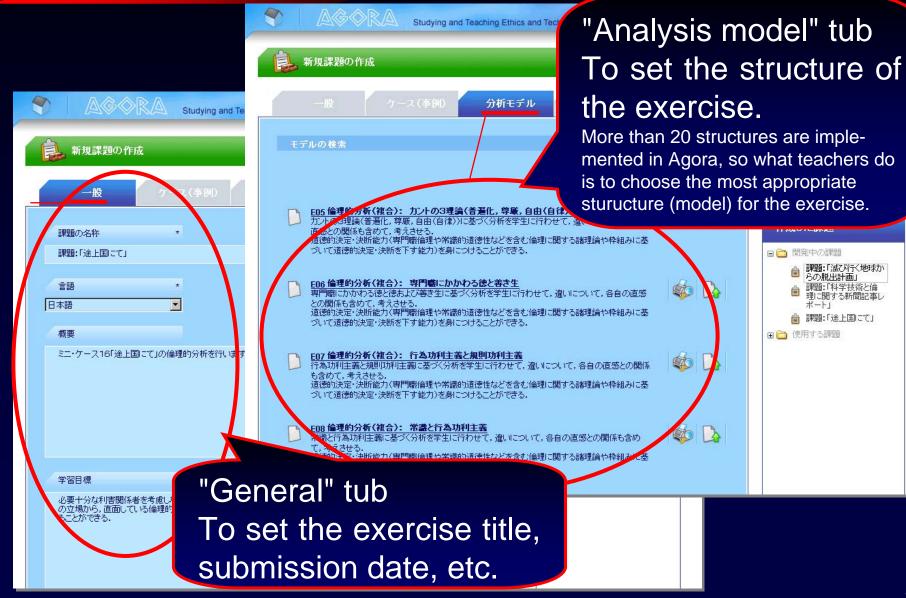
	Studying and Teaching Ethics and Technology Online	ログアウト
<b>自</b> 課題		
	ス(事例) 課題	*-4
ケース(事例)の概要 問題点の明確化	<b>標要:</b> 利害関係者とは何でしょうか? 事例の中では、人やグルーブが、(能動的)行 るいは受動的に他者の下した決断を受けて、何らかの役割を果たしています、これ 人やグループ全てが、その事例における利害関係者です。	
<ul> <li>□置点の分析</li> <li></li> <li>利害間係者</li> <li>✓ 利害</li> <li>✓ 事実</li> <li>✓ 価値</li> <li>行動の選択肢</li> </ul>	<ul> <li>単例の中の利害菌係者をリストアップしてください。</li> <li>指示: 主要な利害関係者5つのみリストアップしてください</li> <li>答え:</li> </ul>	re feedback and to mit their answers nts "submit" their exercise, they feedback from (a) teacher(s) to
<ul> <li>              行動の選択肢          </li> <li>             問題点の再定義         </li> <li>             倫理的評価         </li> <li>             省寮         </li> </ul>	<ul> <li>A国政府</li> <li>A国安全衛生当局</li> <li>周辺住民</li> <li>X社上層部</li> </ul>	eflect their answers.
も京 ディスカッション	解答例: 田中さん、X社、X社上層部で田中さんに「わが社の基準を譲るな」と指示する上 同田中さんに「わが社の基準を無理強いするな」と指示する上司、田中さんの同 田中さんの家族、X社の社員、A国政府、A国安全衛生当局、収納建屋を設置し、 している施設、収納建屋建設予定地周辺で働く人々、収納建屋を建てる業者と作 員、建設資材などの製造・納入業者、日本国政府、など、 説明: 田中さく、X社、X社、ALEの「日本日、日本国政府、など、	

# Teachers: "Welcome" screen





# Teachers: to make an exercise



## Teachers: to evaluate answers

てください。

い点に着目しています。あなたの考えを聞か

の解合の点数 00 01 02 03 04 05 06 07 08 09 010

せてください。

この間の重要度 1 💌

To Evaluate submitted answers and to give feedback

Students' answers are displayed in the circle below. Teachers read them and can make brief comments as feedback and score the answer from 0 to 10.

際の客観性である.

在)を指摘する調査結果は存在していた。にも わらず,東電は,彼らが行った調査結果から の立地に適った安定した地殻である」と評価し

を完全に排除することが不可能なことはいう ないが,この場合は,どの調査結果を採用

見解を変えていない。自分達に都合の良い調査 果のみに依拠しているように思える。主観や恣意

採用しないかにかかわる東電の判断が、広く 2当な判断だとみなされるとは思いにくい、公

に関わることであり,重要な問題点だと

事によると,柏崎刈羽原発の建設当初から その周辺)の地殻の不安定性(活断層など

占は、地質調査の証果を東雷

#### Can change the status of the exercise for resubmission

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When a student submits his/her exercise, the status is changed to "Submitted." If a teacher evaluates the answer and wants the student to deepen his/ her consideration, the teacher can change the status to "Try to submit again!"

EACWS3\_AY07, 1011
EACWS3\_AY07, 1012

### Our activity regarding Agora at KIT

Mid. 2005-; Initiated the introduction (Japanization)

 AY2006; Using Agora 2(J) by teachers. Implementation of Japanese cases

End AY2006; Test by abt. 10 KIT students

 July 2007; Field test in an actuall class of abt. 20 students.

 Aug. - Nov. 2007; Field test in an class of abt. 50 students.

# Test by 10 students at end AY2006

### 

- Abt. 10 students, who had attended "SEE" before, joined the test
- Do one exercise which they had done in "SEE" on Agora
  - →To debug the Agora, and to compare Agora with traditional methods in terms of easiness of understanding

### Feedback from them

User-friendliness should basically be no problem

 Useful as teaching aid to promote students' self-study

## Field test in a class since July 2007

### ■Used Agora in a "SEE" class

- Intensive course for a week for abt. 20 students in July
   ✓ Four of eight exercises were done on Agora
  - ✓No problem

# Ordinary class (10 wks, 2 lectures/wk) for 50 students bet. end Aug. - mid. Nov. ✓Three of eight exercises were done on Agora

✓No problem

# Agora's efficiency

Two exercises to read newspaper articles and pick up ethical problems<sup>※</sup> <sup>※</sup>Full points are 10 (12 for extremely well)

Non-Agora class (50 students)
 ✓ <u>Average</u>: 10.2 pts → 9.6 pts --- down
 ✓ <u>"12 pts"</u>: 26.0% → 0.0% ---- down

Agora class (49 students)
 ✓ <u>Average</u>: 9.1 pts → 9.8 pts ---- up
 ✓ <u>"12 pts"</u>: 0.0% → 8.2% up ---- up

In Agora class, their scores increase as they study further ===> *Agora's effect?* 

### Summary

### Not sure Agora mitigate difficulties

- ✓ It takes time to maintain Agora (administrative work).
- It may take longer time than before to do more minute evaluation (such minute evaluation is impossible unless using Agora).
- Proper feedback to students is possible (it is also impossible w/o using Agora).

### Need to do good preparation

- ✓ Once classes are open, modification is difficult.
- But, once placed in orbit, running classes on Agora is rather easy as new exercises can be made easily by combining existing cases and problems.

As teaching aid, Agora can help students self-study
 ✓ Basically positive reaction by students.
 ✓ Could be especially effective to the moderately motivated.

### Those who are interested in Agora

Try Agora using demo account as a "student"
Japanese? => Use the following ID and p/w
ID=EACWS310xx
y=10xx
Xx=03 - 16

✓ Valid until: the end of this year

•Non-Japanese? => Click "Demo" on the top page

#### Common Requirement:

url=<http://www.ethiekentechniek.nl/>
 WindowsXP + InternetExplorer (5.5 or above. Disable "Pop-up block.")