University teachers' approaches to teaching and their pedagogical use of ICTs: A comparative case study of Finland, Japan and India

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Abstract: The purpose of this study was to explore what salient characteristics can be found in some university teachers' approaches to teaching in Finland, Japan and India, and in what ways university teachers in Finland, India and Japan use ICTs (information and communication technologies) in their own teaching. Furthermore, this study aimed to investigate what ICT applications these same teachers use in their teaching. The data were collected via an electronic survey and interviews. The participants (N=21) were university teachers from Finland (N=8), Japan (N=10) and India (N=3). Their approaches to teaching were explored by applying the ATI (approaches to teaching inventory) and its modified version focusing on the use of ICTs in teaching. The study reported in this paper was a pilot study, thus the results are based on the limited number of respondents. The ATI and ATI_ICT subscales and ICT inventory applied in this study have been confirmed to be valid. The university teachers in Japan and Finland differed in their approaches to teaching: The Finnish teachers scored higher on the CCSF (conceptual change orientated, student-focused) approach to teaching than the Japanese teachers, while the Japanese teachers scored higher on the ITTF (information transmitting, teacher-focused) approach to teaching. Two Indian teachers were classified as having a teacher-focused approach to teaching, while the third was classified as having a student-focused approach to teaching. The teachers' differences in their use of ICTs related more to their disciplinary status than to their cultural background.

Key words: approaches to teaching; use of ICT in teaching; Japan; Finland; India

1. Introduction

It is generally acknowledged that people from different countries differ in their communication styles and behaviors derived from historically and culturally different national contexts. This is why it may be assumed that the cultural elements affect university teachers' approaches to teaching. This also leads to the argument that teaching at university level also differs from each other in different countries.

It is contended that the differences in teachers' approaches to teaching may come from different teaching cultures developed historically and from culturally different national contexts. The university teachers' approaches to their own teaching have been widely explored and the two basically different approaches to teaching have been recognized: an ITTF (information transmitting, teacher-focused) approach and a facilitative, CCSF (conceptual change orientated, student-focused) approach (Kember & Kwan, 2000; Prosser & Trigwell, 1999; Trigwell,

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Prosser & Waterhouse, 1999). Teachers who conceive teaching as information transmitting tend to use content-centered approaches to teaching. They take teaching as a teacher-centered activity, whose main aim is to transmit knowledge to students who are considered to receive this knowledge passively. When the focus shifts from the teachers and what they do when teaching to the students and what they do, the approach to teaching changes towards facilitating student learning and understanding, with an emphasis on the needs of the students and how they can be helped to develop as autonomous learners (Kember & Kwan, 2000).

A study focusing on differences in approaches to teaching between 136 university teachers from the UK and 204 university teachers from Finland revealed that Finnish teachers scored significantly higher in the teacher-focused approach to teaching when compared to the teachers from the UK (Nevgi, Postareff & Lindblom-Ylänne, 2004). The difference in the teacher-focused approach to teaching between teachers from these two countries may show that Finnish teachers are less communicative and interactive in their teaching, because in Finnish culture silence and modesty have been highly valued (Lewis, 1999). This may explain why Finnish teachers scored higher in the teacher-focused approach to teaching. Stes with her colleagues (Stes, Gijbels & Petegem, 2007) found that the Belgian teachers (*N*=50) scored lower on the conceptual-change/student-focused approach scale when they compared the results of their study with Nevgi, et al (2004) and with Lindblom-Ylänne, Trigwell, Nevgi and Aswin (2006). The Belgian teachers' highest mean score (2.78) on the conceptual-change/ student-focused scale was still lower than the lowest mean score (3.40/3.41) as reported by Lindblom-Ylänne, et al (2006) and Nevgi, et al. (2004). Stes, et al (2007) concluded that the difference could be explained as a result of a different teaching culture in the countries concerned: Finland (Lindblom-Ylänne, et al., 2006; Nevgi, et al., 2004), England (Nevgi, et al., 2004) and Belgium (Stes, et al., 2007).

2. Finland, Japan and India—Diverse cultures with high technology

Finland is a good example of a bilingual, culturally-homogeneous and technologically very advanced country with a small population. In Finnish culture, individual values are highly appreciated (Lewis, 2005). Japan represents a unilingual, culturally collectivist country with a large population and a culture that emphasizes traditions (Lewis, 1999). Like Finland, Japan is technologically very advanced. India is a highly populated, multilingual and collectivist country, whose cultural background underlines the importance of family and traditions (Lewis, 1999). Recently, India has made significant progress in the field of technology.

As this study focuses on university teachers, it is relevant to describe, albeit briefly, the higher education systems in the three countries.

2.1 Finnish higher education

Finnish higher education, as Finland itself, has developed its culture and traditions between East and West. The Western influence started in the 12th century with an invasion made by a Swedish king, and continued during the Middle Ages through the influence of the Catholic Church. However, Finland was located between Sweden and Russia, and the influence of the Eastern culture and the Orthodox Church gradually gained ground since the Middle Ages up to 1809, when Finland became part of the Russian Empire. During the 19th and 20th centuries, Finnish universities played an important role in developing Finnish national identity and in achieving independence in 1917. The history of Finnish higher education is deeply linked with Finland's long history between East and West. In Finland, higher education institutions have always been defined and understood as national institutions, and higher education as well as education in general, has had a high social status (Välimaa,

2002). In Finland, literacy is very high, and according to the PISA (Programme for International Student Assessment) studies, Finns have been among the best readers of the world (Finnish National Board of Education, n.d.). The Finnish university system comprises ten multi-faculty universities, three universities of technology, three schools of economics and business administration, and four art academies. In addition to the universities, there are also 29 other higher education institutions usually called polytechnics or universities of applied sciences (Management by Results in Higher Education, Ministry of Education, 2001). Twenty-one summer universities and the Open University offer university-level courses in almost 200 municipalities throughout the country (Välimaa, 2002). All universities are state-run, getting some 70% of their budgets from the state (Ministry of Education, 2004). In 2009, however, the Finnish higher education system lived through a period of radical changes in order to shift from a government-guided system towards an autonomous and independent university system. The new university law, ratified in June 2009, changed the universities' legal status to a legal person under public law. This is expected to increase autonomy in university finances and administration, as the universities also acquired an employer's status. This, of course, is highly important, but as the present study, data were collected prior to this university reform, the authors opted to describe the system, as they have known it so far.

In Finland, the basic right to culture and education is recorded in the Constitution of Finland. The annual student intake in higher education is equivalent to about 65% of the average size of the 19-21 age group. In 2003, there were about 174,000 degree students in universities, 83,000 in the Open University system and over 129,000 in polytechnic degree programs (Ministry of Education, 2004).

2.2 Japanese higher education

There might be a variety of definitions of Japanese higher education, but the so-called Western-style higher education was introduced to Japan after the restoration of the imperial power in 1868. In the beginning, the nine imperial universities played a central role in diffusing Western civilization to all over Japan, and the professors were mostly from the Western nations. In succeeding years, the professors from the Western nations were replaced by Japanese professors by gradation. Many private universities were founded, too. After the World War II, Japan restructured the higher education system to what it is now, after the example of the US system. The higher educational organization in Japan is composed of colleges and universities, junior colleges, specialized vocational high schools (with a 5-year curriculum for junior high school graduates), and vocational colleges (Ministry of Education, Culture, Sports, Science and Technology of Japan, 2007; 2008).

The total number of the higher educational organizations in Japan in 2007 was 4,249. The breakdown is: graduate schools, colleges and universities 756 (national 87, public, run by local governments 89, private 580), junior colleges 434 (national 2, public 34, private 398), specialized vocational high schools 64 (national 55, public 6, private 3), vocational colleges 2,995 (national 11, public 202, private 2,782). The total number of students in the higher educational organizations in 2007 was 3,643,082. The breakdown is: graduate schools 262,113, colleges and universities 2,514,228, junior colleges 179,958, specialized vocational high schools 59,386, vocational colleges 627,397. The enrollment rates of higher education in Japan in 2007 are: universities or junior colleges 54.6%, including correspondence courses or University of the Air 55.9%, and including special course schools 77.6%. Most of the students in Japanese higher educational organizations are in age bracket from 18-22 (Ministry of Education, Culture, Sports, Science and Technology of Japan, 2008).

2.3 Indian higher education

Higher education in India has a long history before the Common Era and has continued to deliver education in the Common Era (Blackwell, 2004, p. 89). One of the first institutions recognized as a university in India was

Nalanda, established by Buddhist monks at the time of Kumaragupta I in 427. Nalanda flourished for seven hundred years until it was destroyed in 1197 by Turkish Muslims (Tharoor, 2007).

Currently, India has the third largest higher education system in the world, next only to US and China. Indian higher education system consists of 342 universities and university-level institutions. Indian universities differ greatly by size and funding. There are 18 central universities, 211 state universities, 95 deemed universities, 5 institutions established under state act and 13 institutes of national importance apart from around 17,000 colleges including 1,800 women colleges in India (Goel & Goel, 2008; Indian Higher Education website). The number of universities is increasing every year.

The total enrolment of students in universities and colleges is 99.54lakh while the number of teachers is 4.5lakh. Only seven percent of the population in the 18-24 age group has access to higher education. India will need 1,500 universities to attain the gross enrolment ratio of at least 15% by 2015. This is a key observation made by the National Knowledge Commission (NKC) in its note to the Prime Minister on higher education, stating that opportunities for higher education "are simply not enough in relation to our needs", thus the NKC has called for a massive expansion of opportunities.

2.4 Why explore approaches to university teaching and the pedagogical use of ICTs in these three countries?

The authors chose Finland, India and Japan as the target countries for this study for a number of reasons. First, their communication styles and cultures differ from one another. Second, their higher education systems also differ considerably, providing a solid basis for comparisons. Finland is a small country with homogenous culture and high literacy. Japan and India represent countries with long traditions in education, and especially in India, the tradition of higher education is very long. However, in India, access to universities is only possible for a minority because of the problems in basic education and the high diversity of economical and social welfare in this country. Japan has very advanced higher education and access to university studies is considerably higher than in India. Finnish universities represent European and German traditions; Japanese universities follow the model of the United States; while Indian universities share similar features with the UK universities. Third, all three countries are technologically advanced. In the Finnish and Japanese universities, the use of ICTs in teaching and web-based teaching is strongly supported. In Indian universities, the use of ICTs in teaching and web-based courses is not yet developed. Fourth, as far as it is known, there is no prior research in this area covering these three countries in the same research project.

3. Research questions

This article aims to answer the following research questions:

(1) What are the salient characteristics of university teachers' approaches to their own teaching in Finland, Japan and India?

(2) In what ways do university teachers in Finland, India and Japan use ICTs in their own teaching? What ICT applications do they use in their teaching, and for what purposes?

This study is part of a larger research project CoCuTel, which aims at better understanding of communication style and cultural patterns of these three countries (Nevgi, Tella & Nishimura, 2008; Nishimura, Nevgi & Tella, 2008).

4. Method

4.1 Participants

The authors' pragmatically and theoretically informed selection (Goetz & LeCompte, 1984, p. 8) consisted of 21 university teachers (13 males; 8 females). As to the teachers' nationality, seven were Finnish (3 females), nine Japanese (1 female), three Indian (3 females), one Swedish (male) and one Chinese (male). The Finnish teachers and the Swedish teacher were from the University of Helsinki. The Japanese teachers and the Chinese teacher were from Waseda University. The Indian teachers came from the University of Goa. Seven teachers were 30-39 years old, eight teachers were aged 40-49, and three teachers were aged 50-59. For the Indian teachers, the exact age could not be confirmed. As for the teachers' mother tongue, six spoke Finnish, two Swedish, nine Japanese, one Chinese, one Marathi and two Konkani. The participants stated that they could speak the following foreign languages: Chinese (1), English (20), Estonian (2), Finnish (7), French (3), German (5), Indonesian (1), Italian (1), Japanese (1), Konkani (1), Marathi (2), Russian (1), Spanish (2) and Swedish (6).

Three participants were full professors, seven associate professors, three readers or adjunct professors, and eight were senior lecturers or university lecturers. Five teachers had formal teacher qualification. The participants' overall teaching experience and teaching experience in higher education is described in Table 1. Generally, the respondents were experienced teachers.

Table 1   The teachers' teaching experience and pedagogical education

Variable	Scale	Frequency
Overall teaching experience	3-5 years	4
	6-10 years	5
	11-15 years	3
	16 years or more	6
Teaching experience in higher education	3-5 years	6
	6-10 years	3
	11-15 years	5
	16 years or more	4

Nine teachers (five Finnish and four Japanese) had no fully online courses. Four teachers (one Finnish and three Japanese) had online courses occasionally and three teachers (one Finnish and two Japanese) taught online courses regularly. Four Japanese teachers had never taught online courses while five Japanese teachers taught online courses occasionally. Five Finnish teachers taught online courses occasionally and four regularly. Ten teachers had participated in pedagogical training courses offered by a university or some other institutions. Eight teachers had no pedagogical training. For the Indian teachers, their participation in pedagogical training courses could not be verified.

4.2 Data collection

In 2008, 18 Finnish and Japanese university teachers were asked to report their pedagogical uses of ICTs, communication style and approaches to their own teaching by filling out the authors' online survey. In the Finnish context, the respondents (N=8) were university teachers attending a pedagogical training course at the University of Helsinki. The Finnish teachers represented diverse disciplines, such as law, humanities and art, social sciences and sciences. In the Japanese context, the respondents (N=10) from Waseda University represented teachers specializing in media. In India, the first author interviewed three university teachers from the University of Goa in January 2008. The Indian teachers represented humanities, art and sciences.

4.3 Procedures

The online survey used in this study consists of three parts: the approaches to teaching inventory (ATI), a modified version of ATI as approaches to teaching and the use of ICTs (ATI_ICT), and questions focusing on the educational use of ICTs.

To measure the university teachers' approaches to their own teaching, the approaches to teaching inventory (ATI) with 22 items developed by researches (Trigwell, Prosser & Ginnis, 2005; Prosser & Trigwell, 2006) was applied. The instrument consists of two scales: 11 items in the conceptual-change/student-focused (CCSF) approach scale and the other 11 items in the information-transmission/teacher-focused (ITTF) approach to teaching scale. The university teachers were first asked to describe their typical courses or teaching situation and then to respond to the 22 items of the ATI instrument using a 5-point Likert-type scale.

The new instrument to measure the university teachers' approaches to their pedagogical use of ICTs (ATI_ICT) was designed and modified from the original ATI by Nevgi and Tella. The instrument consists of two scales. Nine items were developed to measure the conceptual-change/student-focused approach to use ICTs in teaching (CCSF_ICT), and nine items were developed to measure the information-transmission/teacher-focused approach to use ICTs in teaching (ITTF_ICT). The aim of this instrument was to explore the teachers' various educational approaches to using ICTs (Table 2). The university teachers were first asked to describe their typical use of ICTs in class or in teaching situations and then to respond to the 18 items of the ATI_ICT instrument using a 5-point Likert-type scale.

Table 2   Items measuring the educational use of ICTs and approaches to teaching

Items measuring the educational use of ICTs and approaches to teachers' own teaching
C1. I think an important reason for using ICTs when running teaching sessions is to give students a good set of notes. (ITTF_ICT)
C2. I use diverse ICTs (e.g., PowerPoint presentation) to present a lot of facts to students. (ITTF_ICT)
C3. I usually use ICTs (e.g., videos, PP presentation) in order to encourage my students to discuss the topic and help them to change understanding of the subject matter. (CCSF_ICT)
C4. I use diverse ICTs (e.g., blogs, wiki pages) to encourage students to write and think based on their own understanding instead of copying information. (CCSF_ICT)
C5. It is important to give students notes with detailed information in form of handouts of PowerPoint slides or using other communication channels (e.g., wiki pages). (ITTF_ICT)
C6. I use different ICTs (e.g., videos, internet, e-mail) in order to provide the students with the information they will need to pass the test. (ITTF_ICT)
C7. I prefer to use ICTs (e.g., internet, PP presentation, video clips) so that students can present their ideas. (CCSF_ICT)
C8. I prefer to use videos and other types of ICTs in order to help my students to understand how to combine theory into everyday life. (CCSF_ICT)
C9. My use of ICTs (e.g., PP presentation, internet) focuses on delivering knowledge and facts to students. (ITTF_ICT)
C10. I prefer to use simple PowerPoint slides or other presentation forms only with a few words, and in my teaching I explain and deepen the topic. (CCSF_ICT)
C11. I concentrate on covering the information using PowerPoint slides or other presentation forms. (ITTF_ICT)
C12. I prefer to give feedback to my students using ICTs (e.g., video-clips or audio-clips, e-mail) in order to give them familiar and personal feedback. (CCSF_ICT)
C13. I encourage students to use diverse-way ICTs to express their understanding of the topic. (CCSF_ICT)
C14. I carefully prepare my PowerPoint slides to be both informative and visually interesting in order help students learn. (ITTF_ICT)
C15. I usually organize my courses so that students can present their ideas of the topic using PowerPoint slides and other suitable media. (CCSF_ICT)
C16. I support my students learning and rehearsal by helping them to have access to my course material using different ICTs (e.g., Internet, video-clips). (ITTF_ICT)
C17. I use ICTs (e.g., videos, PP presentation, internet) to support students to develop new ways of thinking. (CCSF_ICT)
C18. I use ICTs (e.g., websites, learning platforms) in order to provide the students access to all the essential information of the topic. (ITTF_ICT)

To measure the use of ICTs, a list of different information and communication technologies in an alphabetical order was given to the teachers who were asked to answer the question: "What ICTs do you use in your teaching and communication with your students? Please go through the list and tick how often you use any of them during the academic year". The scale was the following: 1=never; 2=once or twice a year; 3=once or twice per semester; 4=weekly; 5=daily. Teachers were also asked to describe in what ways and for what purposes they used the ICTs given in the list. These descriptions were voluntary.

The first author interviewed the Indian teachers in a face-to-face situation. The interview questions focused on the teaching methods, teachers' approaches to their own teaching, the ways they assessed students' learning and on the teachers' own pedagogical use of ICTs. During the interviews, notes were taken and typed out immediately after the interviews.

4.4 Analyses and statistical procedures

The internal consistency of the sum scales CCSF (0.80), ITTF (0.82), CCSF_ICT (0.91) and ITTF_ICT (0.92) were examined by calculating the Cronbach's alpha coefficient.

The mean composite scores were calculated for the sum scales CCSF (range 2.64-4.73), ITTF (range 1.73-4.27), CCSF_ICT (range 1.00-4.29) and ITTF_ICT (range 1.00-4.33).

To describe the general use of ICTs, the items measuring the use of ICTs were computed as a sum scale use of ICTs. The internal consistency of the sum scale use of ICTs (0.94) was examined by calculating the Cronbach's alpha coefficient. The mean composite scores for the sum scale use of ICTs was calculated (range 0.0-67.0, Mean=31.4, Median=36.0).

The three nationalities teachers were divided into two groups: seven Finnish teachers and one Swedish teacher (*N*=8) as a group of Finnish university teachers, and seven Japanese teachers and one Chinese teacher (*N*=10) as a group of Japanese university teachers. This grouping was justified by the fact that the Swedish teacher was working at the University of Helsinki and the Chinese teacher was working in Japan. This grouping was also considered necessary considering the low number of respondents at this stage.

The authors examined the differences between the Finnish and Japanese teachers in approaches to their own teaching and in their pedagogical uses of ICTs by applying the independent samples *T*-test.

The interviews were deductively content-analyzed in order to recognize whether the respondents expressed an information-transmission/teacher-focused approach or a conceptual-change/student-focused approach to teaching.

5. Results and analysis

5.1 University teachers' approaches to their own teaching in face-to-face teaching situations and in applying ICTs in their teaching

The first research question focused on the characteristic features in approaches to their own teaching of 18 Finnish, Japanese and Indian university teachers. First, the authors calculated the descriptive values (Mean and Standard Deviation) for the ITTF approach to teaching and for the CCSF approach to teaching of Finnish and Japanese teachers. The authors further examined whether the two approaches to teaching correlated with each other. The ITTF approach to teaching had no correlation with CCSF approach to teaching (r=-0.037, p=0.888). However, when the use of ICTs was included in approaches to teaching, the strong positive and significant correlation (r=0.632, p=0.005) was found between the ITTF approach (ITTF-ICT) and the CCSF approach (CCSF-ICT) (Table 3).

Table 3 Pearson correlation coefficients for approaches to teaching original variables and approaches to teaching with ICT variables

	CCSF	ITTF-ICT	CCSF-ICT
ITTF	-0.037	0.577*	0.124
CCSF		-0.006	0.441
ITTF-ICT			0.632**

Notes: * Correlation is significant at the 0.05 level (two-tailed); ** Correlation is significant at the 0.01 level (two-tailed).

By applying a paired samples T-test, the authors further examined for a whole group of respondents (N=18) whether the approaches to teaching changed between typical teaching situations and teaching situations with an emphasis on the use of ICTs. No change was found between ITTF approaches to teaching in two different teaching contexts (typical and emphasis on the use of ICTs). However, the significant difference (t=3.07, d.f.=17, p=0.007) was found in the CCSF approach to teaching in a typical teaching situation (M=3.80, SD=0.61) compared with the CCSF approach to teaching in teaching situation with emphasis on the use of ICTs (M=3.10, SD=1.07).

Both Finnish and Japanese teachers scored higher on the CCSF approach to teaching scale and lower on the ITTF approach to teaching scale, when they considered their typical teaching situations or courses. However, when teachers considered teaching situation in which they used ICT, the Finnish teachers' profiles in approaches to teaching was similar as in their typical teaching situation. The Japanese teachers' profile in approaches to teaching changed, and they now scored lower on the CCSF approach to teaching scale than on the ITTF approach to teaching scale. The authors separately examined both teacher groups by applying the paired samples T-test, whether their approaches to teaching differed between a typical teaching situation and the situation in which ICTs were used. The differences between teaching approaches in typical teaching situations and in teaching situations in which ICTs were applied were not statistically significant in either groups.

To investigate the differences in approaches to teaching between the Finnish and Japanese university teachers, the independent samples T-test was applied and a significant difference (t=2.32, d.f.=16, p=0.034) in the CCSF sum scale and in the ITTF sum scale (t=-2.29, d.f.=16, p=0.036) was found out. The Finnish teachers (M=4.14, SD=0.46) scored significantly higher on the CCSF approach to teaching scale than the Japanese teachers (M=3.54, SD=0.60), who (M=3.23, SD=0.40) scored significantly higher on the ITTF approach to teaching scale than the Finnish teachers (M=2.55, SD=0.83). However, nationality did not make any difference in the teachers' approaches to teaching, when considering their pedagogical use of ICTs (see Table 4).

Table 4 The descriptive values (Mean and Standard Deviation) of the subscales of ATI and its modified version ATI-ICTs for Finnish and Japanese teachers

Approaches to teaching subscales		Finnish university teachers (N=8)	Japanese university teachers (N=10)
ITTF	M	2.55	3.23
	SD	0.83	0.40
CCSF	M	4.14	3.54
	SD	0.46	0.60
ITTF_ICT	M	2.47	3.34
	SD	0.88	0.95
CCSF_ICT	M	3.22	3.00
	SD	1.27	0.94

Notes: Scale: 1=only rarely true for me, …, 5=almost always true for me; ITTF=information-transmission/teacher-focused approach to teaching subscale; CCSF=conceptual-change/student-focused approach to teaching subscale; ITTF_ICT=information-transmission/teacher-focused approach to teaching with using ICTs subscale; CCSF_ICT=conceptual-change/student-focused approach to teaching with using ICTS subscale.

Two of the interviewed Indian teachers were classified as having a CCSF approach to teaching, while the third Indian teacher was classified as mainly having an ITTF approach to teaching. The two teachers who emphasized the CCSF approach to teaching in the interviews also stressed the meaning of understanding in learning and they were interested in finding out that their students should also understand the topic to be learned:

> The students like the fact that their teacher explains a lot and they listen when you explain. When I explain something, I also always ask whether they have understood, and the students are supposed to ask if they do not understand or they disagree. Actually, we are discussing a lot, all the time. (An Indian female university teacher, age group 40-49)

The CCSF approach to teaching was also visible, when a teacher explained how she put a lot of emphasis on discussions and group work, and that her students could give feedback to her. When using ICTs, students should learn together and share ideas. Some teachers also explained that the students should learn for real life, not just to pass the exams.

> I'll give a lot of feedback to my students. We discuss a lot in the class. I arrange my students to work in groups, and I'll give feedback to the student groups. Yes, students give also feedback to teachers. I'll have thirty students and fifteen students practice in computer science (in the class). Labs are open for twenty-four hours. Students learn when they are discussing in groups. Initially not group work (studies are first done individually). From the third semester, the students do group projects, seminar courses in group, they choose themselves the topics and work in a project to solve and learn the topic. At 6th semester they go out from university to industry to real life. That is very good for them, because they will make contacts for later employment. (An Indian female teacher, age group 50-59)

One teacher also expressed an interest in the students' future working life and emphasized that she wanted to be sure that her students would learn all the necessary ICT skills for working life. Her approach to teaching could be described to resemble an ITTF approach:

> I'll teach mass communication, they learn all about communication skills. They learn to use internet. As a teacher, I make my students compulsory to learn IT skills, because they need those skills after they have graduated and they go to have their first jobs. I'll teach them to type in front of me, so that I can see if they make mistakes, I can correct immediately. (An Indian female teacher, age group 50-59)

5.2 The Finnish and Japanese teachers' pedagogical use of ICTs in teaching and in communication with students

The second research question focused on whether and how often the university teachers used different ICTs in their teaching and communication with their students (Table 5). The authors first examined the difference between the Finnish and Japanese teachers in their pedagogical uses of ICTs by applying the independent samples *T*-test. Generally, the Finnish teachers (*M*=24.4, *SD*=21.8) used diverse ICTs in their teaching and communication with students less actively when compared with the Japanese teachers (*M*=37.1, *SD*=16.1). The difference between the two groups was not, however, statistically significant ($t_{(16)}$=-1.43, *p*=0.173).

Next, the authors separately examined different ICTs in order to find out how frequently teachers used them in their teaching (see Table 5) and for what purposes.

ApuMatti (Assistant Matt) is a simple technological tool developed at the University of Helsinki for the teaching staff to design, upload and publish their web courses or various web pages for both online and F2F (face-to-face) teaching situations. Only one Finnish teacher reported that she used ApuMatti yearly. She reported that she used it to transfer information to her students about different ICTs in her teaching courses. One Finnish male teacher commented that he had never used ApuMatti, because he had not need that platform. One male

Finnish teacher reported that he never used ApuMatti, because he thought it was not flexible enough although it is easy to use.

Table 5   The Finnish and Japanese university teachers' uses of ICTs in their teaching and communication with their students

	Finnish teachers		Japanese teachers	
	Yes	No	Yes	No
ApuMatti	1	7	0	10
Audio-clips	1	7	4	6
Blogs	1	7	4	6
Cell phone (mobile)	0	8	4	6
Chatting	1	7	2	8
Discussion forum	2	6	6	4
E-mail	3	5	7	3
Face-to-face	4	4	7	3
Fax	1	7	1	9
Fax-mail	1	7	0	10
Homepage (yours or your students)	2	6	4	6
Letters (snail-mails)	3	5	1	9
Messenger	0	8	1	9
MMS	0	8	0	10
PowerPoint	3	5	7	3
SMS	1	7	0	10
Telephone	4	4	4	6
Video-calls	1	7	3	7
Video-clips	1	7	3	7
Videoconferencing	2	6	3	7
Web sites	4	4	4	6
Wiki pages	2	6	3	7

Four Japanese teachers and one Finnish teacher wrote that they used audio-clips and blogs in their teaching. However, most of the teachers (N=13) did not use audio-clips in their teaching. One Finnish male teacher wrote that he used audio-clips in his courses to help his students hear and understand better, and he also explained that he used videos for his "courses of audiovisual translation". One Japanese female teacher explained that she used blogs to "update literature guide for her seminar". One Finnish male teacher also aired his view that perhaps he should try blogs, but that would require him to first get motivated to learn how to use blogs before he could motivate his students.

None of the Finnish teachers used cell phones in their teaching, while four Japanese teachers did that. However, the Japanese teachers did not report how and why they used cell phones in their teaching. One Finnish female teacher explained that she used cell phones in her supervision and the students contacted her by cell phone: "Some of my graduate students and post graduate students take contact with me by cell phone". One Finnish male teacher explained that, "Sometimes I have to call"; and another Finnish male teacher reported that he had no need to use a cell phone in his teaching. One Finnish teacher and two Japanese teachers applied chatting, and one Finnish male teacher commented that he used chatting in order to communicate with students. Six Japanese teachers and two Finnish teachers used discussion forum. One Japanese male teacher used a discussion forum after he had presented lectures via video.

Both Finnish and Japanese teachers reported that they used e-mail in their communication with students, and when they were dealing with individual students. They also reported that e-mail was easy and flexible to use to have regular contact with individual students if they were absent and to give information as well as to deliver learning material to students. Face-to-face communication with students was used by four Finnish and seven Japanese teachers: Both Finnish and Japanese teachers explained that they used face-to-face teaching for communication with students, for lecturing or for giving students time and possibility to ask questions.

One Finnish female teacher reported that she used fax in her teaching in order to give information to her students who were abroad. She also reported that she used letters (snail-mails) for similar purpose. The Japanese teacher using fax did not report how and why. None of the teachers reported about the use of fax-mail in their teaching.

Four Japanese teachers and two Finnish teachers used homepage in their teaching. One Japanese teacher, but no Finns, used messenger. None of the teachers applied multimedia message service (MMS). However, one Finnish teacher used short message service (SMS), and explained that, "Sometimes it is the fastest way".

Three Finnish teachers and seven Japanese teachers used PowerPoint slides in their teaching. A Finnish female teacher used PowerPoint slides when presenting and clarifying the topic:

> I use PP slides to present theories, examples and main themes of the issue. (A Finnish female teacher, age group 50-59)

A Japanese male teacher used PowerPoint slides when transferring information or helping his students to concentrate on listening:

> I always use the PowerPoint for presenting the information/knowledge/concept. The purpose is to run my teaching effectively and to help student to concentrate on listening to my explanation. As a result, I take about 10 or 15 minutes for students to write the reaction paper to my lecture at the end of each lecture. (A Japanese male teacher, age group 40-49)

Four Finnish teachers and four Japanese teachers used telephone in their teaching and communication with students. One Finnish female teacher commented that telephone was only for students to contact to her. One Finnish teacher and three Japanese teachers used video-calls and video-clips. One Finnish female teacher (age group 30-39) reported that, "Occasionally, I have come across good videos made by others but, I guess I could make them by myself also", and one Finnish male teacher (age group 40-49) reported that he used video-clips on platforms. One Japanese male teacher (age group 40-49) reported that he used video-clips in order to present lectures.

Four Japanese teachers and two Finnish teachers applied videoconferencing and four Japanese teachers and four Finnish teachers used web sites. Two Finnish female teachers reported that they used web sites as references and extra sources for their students or that they had collected useful links for their students as extra material. Two Finnish teachers and three Japanese teachers used wiki pages in their teaching and communication with their students. One Finnish female teacher explained that wikis were "easy and flexible to update course info and assignments. Students use them for discussions", and another Finnish female teacher reported that, "My students write collaboratively an assignment by using wiki and I give feedback to my students during their writing process". A Finnish male teacher (age group 40-49) reported diverse use of wiki, and he used wiki for course bookkeeping.

One Finnish female teacher commented on her use of ICTs in her teaching as follows:

> Currently I use BSCW (Basic Support for Collaborative Work: A European Union-based technical platform) and

wiki for delivering materials, providing updated course info, and as a student discussion forum and a place for getting
together to discuss the course literature. The groups are very self-directed and work autonomously. (A Finnish female
teacher, age group 50-59)

The respondents answered that they used ICTs mainly in order to deliver or transfer information and to clear
up the topics to be studied. They also told that using ICTs was fairly convenient and it helped to manage the
course assignments while organizing the lecture materials at the same time.

5.3 The relationship of approaches to teaching and the pedagogical use of ICTs

Finally, the authors analyzed how the approaches to teaching were related to how frequently teachers used
ICTs in their teaching by applying the Pearson correlation analysis. The ITTF_ICT correlated (r=0.49) statistically
significantly (p=0.034) with the pedagogical use of ICT in teaching, and ITTF was also positively related (r=0.23),
though not statistically significantly with the pedagogical use of ICTs. Neither the
conceptual-change/student-focused approach to teaching nor the CCSF with ICTs were related to the pedagogical
use of ICTs.

6. Discussion and conclusions

The purpose of this study was to explore what salient features could be discovered in approaches to their own
teaching of some university teachers from Finland, Japan and India. First, the authors examined the reliability of
the approaches to teaching instrument (ATI) and its modified version, into which the pedagogical use of ICTs was
incorporated (ATI_ICT) by them. The subscales proved to be highly reliable and homogenous with Cronbach's
alpha values varying from 0.80 to 0.92. When considering the typical teaching situation, no correlation was found
between the two subscales of approaches to teaching, which was in line with Prosser and Trigwell (2006). Thus
when teachers consider their typical teaching situation, the two approaches to teaching are confirmed to be
qualitatively different and expressing basically different approaches to teaching.

Contrary to that, in the teaching situations in which ICTs were used, the teachers' approaches to teaching
were related with each other, and both the information-transmission/teacher-focused (ITTF_ICT) approach and
the conceptual-change/student-focused (CCSF_ICT) approach correlated statistically significantly high. Both the
ITTF approach to teaching in the typical teaching situation and the ITTF approach to teaching in the teaching
situation in which ICTs were used were related to the more frequent use of ICTs in teaching. Thus it was not the
case with the CCSF approach to teaching which was not related to the more frequent use of ICTs in teaching. It
may be assumed that this finding is dependent on two reasons. Firstly, the use of ICTs changes the teachers' focus
from students learning towards their own acts and presentation of the material. Though teachers apply ICTs
mainly to communicate with their students, the major reason for the use of ICTs is to give information about the
topic in flexible and more easily digested ways. Secondly, it may be possible that the ITTF_ICT approach does
not measure the information-transmission/teacher-focused approach to teaching in the same way as the original
scale. Perhaps the very adding of the ICTs to the items measuring the scale has changed the scale towards the
conceptual-change/student-focused approach to teaching. This argument could be grounded on the positive
correlations between the CCSF and the CCSF-ICT, and between the ITTF_ICT and the CCSF_ICT. The finding
that there was no correlation between the ITTF_ICT and the CCSF could be explained as a result of the use of
ICTs. However, the ITTF and ITTF_ICT correlated highly and statistically significantly, revealing that the two
sub-scales were measuring a similar approach to teaching. The ITTF and ITTF_ICT were not related with the

CCSF, basically, because the scales measure different approaches to teaching, and also because the use of ICTs in teaching separates the two scales.

These two inferences must be borne in mind. More research is needed to deepen the knowledge about how the use of ICTs changes the teachers' approaches to their teaching. The Indian teachers reported the use of PowerPoint and Internet in their teaching. They emphasized that their students would need skills to use ICTs in working life and they wanted to help their students to achieve the necessary skills in the use of ICTs. Indian teachers did not fill out the questionnaire, so that no conclusions were possible about the variety of their use of ICTs in teaching. The Japanese teachers tended to use more frequently ICTs that included various components of multimedia (e.g., audios, videos) when compared with the Finnish teachers. However, it may be assumed that the tendency to use multimedia applications in teaching is related to the Japanese teachers' disciplinary status and not necessarily to the cultural differences between Finland and Japan. All the Japanese teachers represented media sciences, and this probably explains why they used multimedia more than the Finnish teachers, who represented various disciplines and were not specialized in using ICTs in their teaching. However, all teachers' comments concern their uses of these ICTs in teaching. It may well be that they used them also for personal benefit but not in their teaching. Besides, it is important to notice that the use of these ICTs is what the respondents reported that they had been using; there was no direct evidence for that they really did as they said.

One limitation of this study is related to that it is a pilot study with a limited number of respondents. However, it is believed that indicatory of the trends that can be found in university teaching in the three countries studied, that is, Finland, India and Japan. More data will be gathered in 2010, and the analysis will then be widened to cover some other countries as well, including the United States.

Some of the implications of this study support the authors' pre-understanding: University-level teachers need to be trained to be conscious and even cognizant of their approaches to their own teaching. This apparently calls for further training in higher education. In addition, even if university teachers use different information and communication technologies (ICTs) for their own personal purposes and benefit, they clearly need to be educated in the pedagogical use of many current ICTs in order to enhance, endorse and strengthen their pedagogical input and deeper comprehension of the value and utility of these technologies.

In short, if they are adequately aware of their approaches to their own teaching, university-level teachers are more competent to reflect on their teaching practices and their own ways of dealing with new information and knowledge to be shared with their students. At the same time, in this way the university-level teachers are more conscious of different theoretical ways of contacting students and preparing them for both academic and professional lives after university.

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