Cultivate Elderly Students' ICT Literacy Necessary for Taking Online Courses

The 7th OUJ-OUK-KNOU International Seminar

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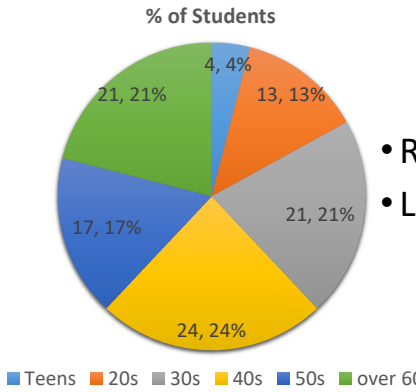
Outline

- Background
- Digital Literacy Training
- ICT Skill Retention Study
  - Purpose & Hypotheses
  - Method
  - Results
  - Discussion
- Revision of Training Content

Background: Digital Literacy

- The knowledge, skills, and behaviours to identify, locate, organize, use, and communicate information using digital devices.
- Information literacy required for members of knowledge society.

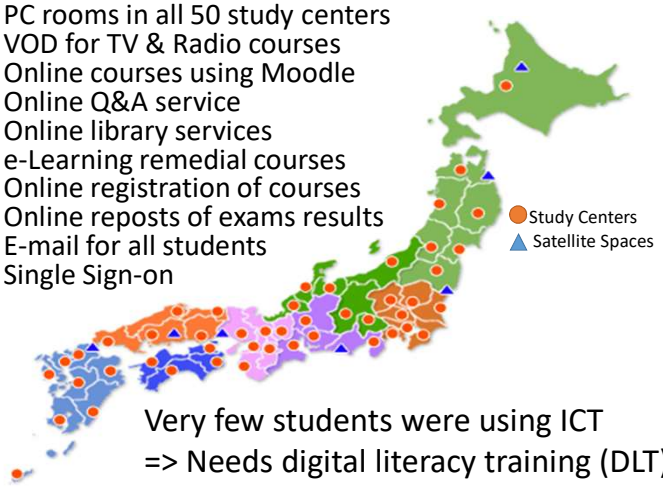
Background: Age Distribution of Students



- Relatively old
- Low ICT skills

Background: ICT Service of OUJ

- PC rooms in all 50 study centers
- VOD for TV & Radio courses
- Online courses using Moodle
- Online Q&A service
- Online library services
- e-Learning remedial courses
- Online registration of courses
- Online reposts of exams results
- E-mail for all students
- Single Sign-on



Very few students were using ICT
=> Needs digital literacy training (DLT)

Digital Literacy Training Course

- Set up a face-to-face course “The Personal Computer for Beginners” (2010）
- Offer at least once a year at each of 50 study centers all over Japan
- Initially taught by the fulltime faculty, then entrusted to adjunct faculty + assistants
- Use common syllabus and common textbook (originally developed)
- 12-hour intensive course with hands-on training
- Measure student ICT skills using pretest and posttest in-class checklist to improve learning outcomes

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Content of the Class

1. Basic operation of PC
2. Word processing using WORD 2010 (introductory)
3. Web and electronic mail
4. Security and manner
5. OUJ’s ICT services
6. Word procession using WORD 2010 (sophistication)
7. Presentation (PowerPoint2010)
8. Introduction of Learning Management System (LMS) and TV conference system

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ICT Skill Retention Study

Purpose

- Identify whether students’ perceived level of ICT skills acquired in the DL training course was retained after one to three years.
- Examine how these skills were utilized after they completed the course.
- Identify problematic ICT skills by comparing perceived ICT skills at pretest, posttest, and survey In order to improve course contents and postcourse support for students

Hypotheses

1. The perceived level of ICT skills acquired through the DL training course remains unchanged after one to three years,
2. The level of retention of the perceived ICT skills acquired through the DL training course differs depending on the age of students,
3. Students’ everyday use of a PC and the Internet is associated with the level of retention of perceived ICT skills acquired through the DL training course, and,
4. Students’ learning methods are associated with the level of retention of perceived ICT skills acquired through the DL training course.

Method: data collection

Perceived level of18 ICT skills (five-point Likert scale)

- Pretest (in class)
- Posttest (in class)
- Survey (Questionnaire)
  - Perceived level of ICT skills (five-point Likert scale)
  - PC/Internet usage (Alternative formula)
  - Post-course continuing learning (multiple choice)

=> Sent surface mail survey to OUJ students who had taken a DL training course between Oct. 2010 and Sept. 2014 (2,112)

=> 1,153 responses (54%) => 1,133 effective responses

Method: data analysis

Statistical analysis

a. Shift of ICT skills between pre, post, and survey
b. Age vs. shift of ICT skills (post and survey)
c. PC/Internet usage vs. shift of ICT skills (post and survey)
d. Postcourse learning vs. shift of ICT skills (post and survey)

Statistical tests: non-linear statistical test

- Wilcoxon signed-rank test for correlated samples ($P<.05$) for a
- Mann–Whitney U test ($P<.05$) for b
- χ^2 for c and d

Result: pretest, posttest, survey

Table 1 Changes in Scores in Student ICT Skills

ICT Skill (Learning Outcome)	N^1	Pretest M	Pretest Me	P^1	N^2	Posttest M	Posttest Me	P^2	Survey M	Survey Me
a. Able to boot, log on to, and log off	1,078	2.79	3	.000**	1,082	4.24	4	.000**	3.86	4
b. Able to input Japanese letters using a keyboard	1,118	3.40	4	.000**	1,114	4.19	4	.000**	4.39	5
c. Able to run application software	1,054	2.61	3	.000**	1,067	3.83	4	.014*	3.74	4
d. Able to access the OUJ webpage	1,100	2.81	3	.000**	1,098	4.13	4	.046*	4.07	4
e. Able to search for information using a search engine	1,070	2.60	3	.000**	1,071	3.83	4	.012*	3.77	4
f. Able to exchange emails using an OUJ account	1,082	1.78	1	.000**	1,077	3.52	4	.000**	2.87	3
g. Able to change own password	1,093	1.92	1	.000**	1,093	3.83	4	.000**	3.24	4
h. Able to access OUJ courses on the Internet	1,098	2.46	2	.000**	1,102	4.05	4	.000**	3.86	4
			1	.000**	1,051	3.26	4	.000**	2.70	3
			2	.000**	1,097	4.02	4	.000**	3.77	4
			1	.000**	1,067	3.47	4	.000**	3.22	4
			1	.000**	1,074	3.45	4	.000**	2.66	3
			1	.000**	1,082	2.84	3	.000**	2.20	1
			1	.000**	1,084	3.29	3	.000**	2.63	3
			2	.000**	1,105	3.78	4	.005*	3.69	4
p. Able to write and print documents	1,112	2.86	3	.000**	1,110	4.04	4	.458	4.06	4
q. Able to copy, save, delete, and move files	1,109	2.62	3	.000**	1,113	3.75	4	.267	3.72	4
r. Able to create 5–6 slides using PowerPoint	1,089	1.44	1	.000**	1,086	3.41	4	.000**	2.58	2

five-point Likert scale
1 can not do/ never done
2 it was done
3 might be able to do
4 can do
5 can do with confidence

Results: four patterns of ICT skill change

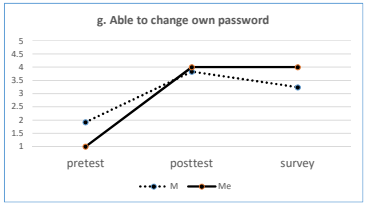
Pattern I: The median of the lowest pretest score(1) improved to a higher level and has been retained to the survey.

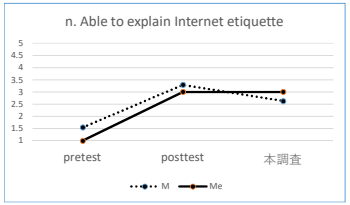
Pattern II: The median of the moderate pretest score (2 or 3) improved to a higher level (4) and has been maintained to the survey.

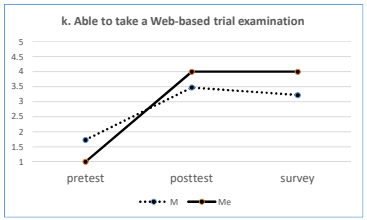
Pattern III: The median of the lowest pretest score (1) improved to a higher level, but has been declined by the time of survey.

Pattern IV: The median of the moderate pretest score (2 or 3) improved to a higher level (4) and then progressed to the highest level (5) in the survey .

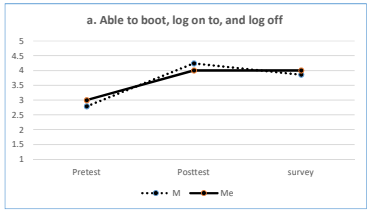
Pattern I: The median of the lowest pretest score(1) ○ improved to a higher level and has been retained to the survey

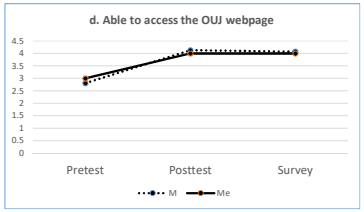


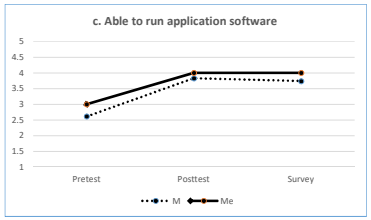


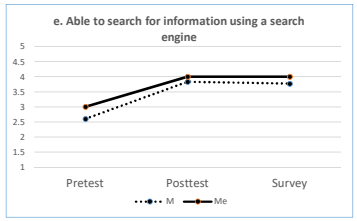


Pattern II: The median of the moderate pretest score (2 or 3) improved to a higher level (4) and has been maintained to the survey. ○









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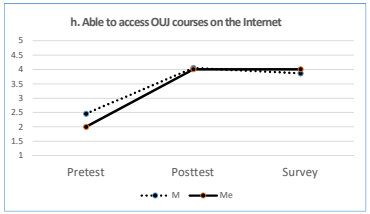

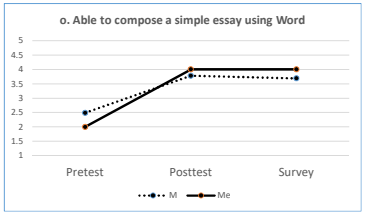

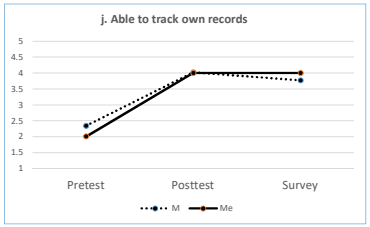

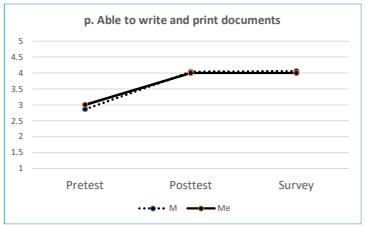

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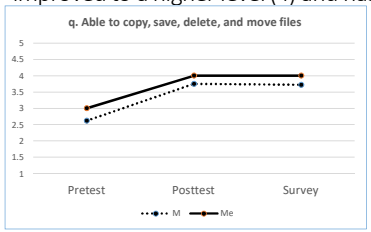
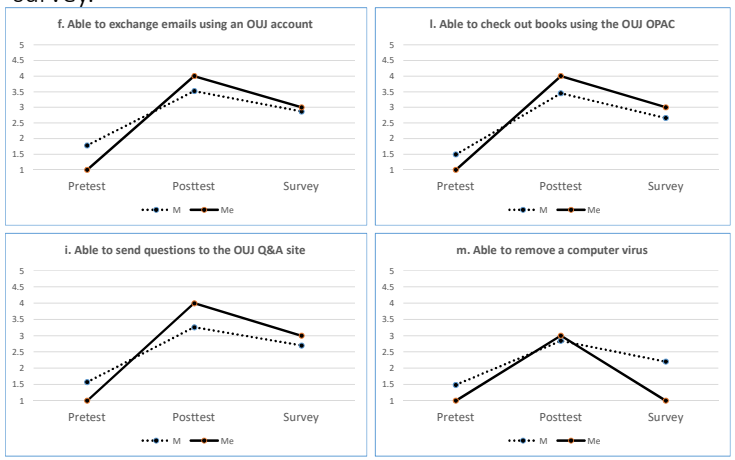


Pattern III: The median of the lowest pretest score (1) improved to a higher level has been declined by the time of survey. ×



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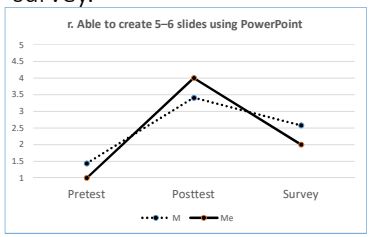
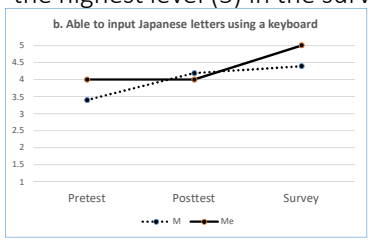


Pattern IV: The median of the moderate pretest score (2 or 3) improved to a higher level (4) and then progressed to the highest level (5) in the survey .◎



Results: Relationship between Perceived ICT Skills and PC/Internet Usage

- Retain: students whose average survey score on all items was equal or higher than that in the posttest
- Decline: students whose average score was lower than that of the posttest.

⇒Retain group used PC/Internet significantly more frequently than those in the Decline group.

⇒Elderly students uses of PC/Internet is relatively infrequent compared to younger students.

Result: Perceived Skill and Frequency of PC Use

Table 5. Perceived Skill and Frequency of PC Use

Frequency of PC Use	Retain	Decline	Total	χ^2	*P*
6 days/week	194 (48.4%)	207 (51.6%)	401 (100%)	55.59	**.000****
4–5 days/week	61 (32.1%)	129 (67.9%)	190 (100%)	.44	.507
2–3 days/week	53 (29.3%)	128 (70.7%)	181 (100%)	2.14	.144
1 day/week	38 (27.0%)	103 (73.0%)	141 (100%)	3.98	**.046***
1 day/2–3 weeks	11 (17.7%)	51 (82.3%)	62 (100%)	8.30	**.004****
Less than 1 day/month	13 (20.3%)	51 (79.7%)	64 (100%)	5.80	**.016****
No use	15 (18.1%)	68 (81.9%)	83 (100%)	10.34	**.001****
Total	385 (34.3%)	737 (65.7%)	1122 (100%)		

Result: Perceived Skill and Frequency of Internet Use (Table 6)

Table 6. Perceived Skill and Frequency of Internet Use

Frequency of Internet Use	Retain	Decline	Total	χ^2	*P*
6 days/week	182 (47.5%)	201 (52.5%)	383 (100%)	46.86	**.000****
4–5 days/week	67 (35.3%)	123 (64.7%)	190 (100%)	.081	.776
2–3 days/week	63 (35.0%)	117 (65.0%)	180 (100%)	.063	.802
1 day/week	31 (25.4%)	91 (76.4%)	122 (100%)	5.68	**.30***
1 day/2–3 weeks	8 (15.4%)	44 (84.6%)	52 (100%)	8.56	**.003****
Less than 1 day/month	11 (15.9%)	58 (84.1%)	69 (100%)	10.87	**.001****
No use	22 (18.2%)	99 (81.8%)	121 (100%)	15.43	**.000****
Total	385 (34.3%)	737 (65.7%)	1122 (100%)		

Result: Age and Retention of ICT Skills

ICT Skill	≥61 years N	*M*	*Me*	≤60 years *N*	*M*	*Me*	Mann–Whitney *U*	*P*
a. Able to boot, log on to and log off	614	–.39	0	468	–.34	0	140,227.5	.467
b. Able to input Japanese letters using a keyboard	638	.26	0	476	.12	0	165,574	**.004***
c. Able to run application software	602	–.06	0	465	–.11	0	143,662.5	.433
d. Able to access the OUJ webpage	619	–.05	0	479	–.08	0	150,424.5	.647
e. Able to search for information using a search engine	603	–.12	0	468	–.04	0	136,157	.287
f. Able to exchange emails using an OUJ account	609	–.71	0	468	–.60	0	135,212	.134
g. Able to change own password	620	–.64	0	473	–.52	0	139,929	.175
h. Able to access OUJ courses on the Internet	627	–.22	0	475	–.17	0	146,795.5	.661
i. Able to send questions to the OUJ Q&A site	588	–.64	0	463	–.45	0	125,985	**.029***
j. Able to track own records	624	–.27	0	473	–.24	0	144,095.5	.469
k. Able to take a Web-based trial examination	599	–.32	0	468	–.18	0	131,296	.063
l. Able to check out books using the OUJ OPAC	602	–.87	–1	472	–.71	0	131,640	**.032***
m. Able to remove a computer virus	610	–.64	0	472	–.64	0	144,097	.978
n. Able to explain Internet etiquette	615	–.73	–1	469	–.59	0	133,894.5	**.036***
o. Able to compose a simple essay using Word	629	–.05	0	476	–.14	0	156,013	.203
p. Able to write and print documents	636	.09	0	474	–.05	0	161,056.5	**.032***
q. Able to copy, save, delete, and move files	639	.00	0	474	–.07	0	155,584.5	.302
r. Able to create 5–6 slides using PowerPoint	613	–.90	–1	473	–.71	–1	130,869.5	**.005****

Results: Relationship between Perceived Skills and Continuing Learning

Contributing Method of Postcourse Learning (significant)

- Self-instruction
- Joining a learning community
- Taking a TV course on “Use of PC for Distance Learning”

Non-contributing Method of Postcourse Learning (Not significant)

- Learning from a family member
- Learning from a friend

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Results: Relationship between Perceived Skills and Continuing Learning

Table 7. Learning Practices and Perceived Skills

Learning Method	Retain	Decline	Total	χ^2	*P*
Self-instruction	221 (40.0%)	332 (60.0%)	553 (100%)	16.035	**.000****
Learning from a family member	81 (32.4%)	169 (67.6%)	250 (100%)	.456	.500
Learning from a friend	53 (35.3%)	97 (64.7%)	150 (100%)	.101	.751
Joining a learning community	31 (51.7%)	29 (48.3%)	60 (100%)	8.604	**.003****
Taking a TV course	53 (47.7%)	58 (52.3%)	332 (60.0%)	10.060	**.002****
Total	387 (34.2%)	745 (65.8%)	1,132 (100%)		

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Discussion: Verification of Hypothesis

1. Perceived level of ICT skills categorized as Patterns I and II was retained, while Pattern IV improved. In contrast, Pattern III declined.
2. Retention of the perceived level of ICT skills differed between students in the two age groups.
3. Retention of the perceived level of ICT skills was positively related to the frequency of PC and Internet usage by students.
4. Self-instruction, joining a learning community, and taking TV courses had a significant effect in the retention of the perceived level of ICT skills.

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Discussion: Challenges for Retention of Students' Learning

ICT Skills in Pattern Ⅲ (The median of the lowest pretest score improved to a higher level, but has been declined by the time of survey) are problematic!

- e-mail exchange,
- sending questions,
- check out books of library,
- remove computer vires, and
- and create PowerPoint slides.

⇒Reinforce these skills by

- introducing a more effective way of teaching,
- encouraging students to continue using the PC/Internet and taking TV distance-learning courses,
- establishing a PC learning community at each study center.

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Discussion: Visualization Effects

Visualize the shifts of perceived level of ICT skills

- Readily recognize the ICT skills that students retained or not
- Posttest score is naturally higher than pretest score
- More important to demonstrate which skills are retained long after the training course is over

=> Method implemented in this study to visualize the changes of ICT skills in the pretest, posttest and survey is proved useful in identifying problematic skills

=> Make the result readily usable in seeking more effective ways of teaching and postcourse support for students

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Revision of Course Content

- Try to reflect what we learned from the retention study.
- Add an experience of using a trial version of online course to prepare students for taking online courses started in 2015.

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	Old Contents ~2016	New Training Contents 2017~
1	Basic operation of PC	Basic operation of PC
2	Word processing using WORD 2010 (introductory)	Word processing using WORD 2013 + PDF
3	Web and electronic mail	Web and electronic mail
4	Security and manner	Security and manner
5	OUJ's ICT services	OUJ's ICT services
6	Word procession using WORD 2010 (sophistication)	OUJ's online library services
7	Presentation (PowerPoint2010)	Taking online course
8	Introduction of LMS and TV conference system	Summary and reflection

Thank You for Your Attention!

Questions?