



SKILLS DEMONSTRATION AS A PART OF A VOCATIONAL COURSE

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**Development Project Report
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Teacher Education College

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| Abstract A skills demonstration is included to a vocational course in electronics: “the Computer Equipment and Structure”. The course is 2,5 studying weeks. The course is studied during two periods, which is 16 weeks and 5 hours per week. The demonstration consists of assembling a personal computer according to a customer’s order. The students have an opportunity to make this demonstration after studied theory. The theory part is studied using a web-based studying environment. A precondition for the demonstration is that the students prove their theoretical knowledge in a verbal and a written exam. The demonstrations are started about in the middle of the course, depending on a student’s abilities to work with the theory. The project is considering what the students think about the skills demonstrations as specified by the NBE and what the teachers’ duties are in this process. The project includes also planning, implementation and testing of a competence test together with the students and colleagues and evaluation of its usability as an educational instrument. | | |
| Keywords Electronics, Vocational Course, Skills Demonstration, Competence Test, Implementation | | |
| Miscellaneous | | |

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1 SKILLS DEMONSTRATION AS A PART OF A VOCATIONAL COURSE

Skills demonstrations are being incorporated into the vocational education. One or more demonstrations are given during the first year at school. On the second and the third studying year the demonstrations are given both at school and at workplaces during the on-the-job-learning. The number of demonstrations is at the very least six.

In my project I am implementing a skills demonstration into a vocational course for second year electrical engineering students. The study programme is Electronics and Telecommunications Technology and the course is The Computer Hardware Structures (Tietokonelaitteiden rakenne). The course is 2,5 study weeks or 4,5 credit units. Usually the course is spread over two studying periods, which means about 16 weeks and 5 hours each week on the average. The theoretical part of the course is put into a web-based learning environment Moodle. The practical part includes fitting components to a personal computer and assembling or changing parts and peripherals to a computer. One purpose or target of the course is that students learn how to assemble a personal computer from its components. The students should also be able to install an operating system and other basic software into a personal desktop computer.

In this connection the assembling of a personal computer is a natural and ideal subject for the skills demonstration. The demonstration consists of assembling a personal computer according to a customer's order. The order is designed by the course teacher or a real customer. The students can make the demonstration after studied theory and a passed exam.

In this project the intention is to evaluate the pedagogic significance and the practical meaningfulness of this demonstration. Another objective is to create

tools for tuition, such as skills demonstration instruction, exam form, order form, performance follow-up form, assessment form and feed-back form. The pedagogic consideration is submitted after an accomplished round of skills demonstrations and it is based on the feed-back from the students and colleagues and from a representative of the business life.

2 BACKGROUND OF THE PROJECT

The Finnish National Board of Education, FNBE has stated that starting in 2006, a vocational skills demonstration in the form of a competence test shall be included in vocational qualifications as proof of having reached the goals given to vocational studies. (Vocational Education and training 2006)

As the skills demonstrations are being incorporated into the education there has been made a decision that the assembling of a personal computer is going to be one of the demonstrations. In fact, this demonstration is described in the exemplary material for skills demonstration in the FNBE's National Material for Vocational Competence (Opetushallitus 2006, 119). As the national material is meant to be a guiding principle for the planning of the demonstration, it is both practical and necessary to document the demonstration.

The documentation means that there has to be a description and instructions on the demonstration. Also a follow-up form and assessment form are needed.

The assembling of a personal computer has been a de-facto part of the studies for a number of years. Usually this has been carried out by using dummy parts, so there has not been a possibility to install programmes to the system. Occasionally there has been a chance to make a use of working but non-modern components and thus fulfil the actual requirements of the curriculum.

3 DESCRIPTION OF A VOCATIONAL STUDY MODULE

The central contents of first and second year studies can be divided into four groups as illustrated below.

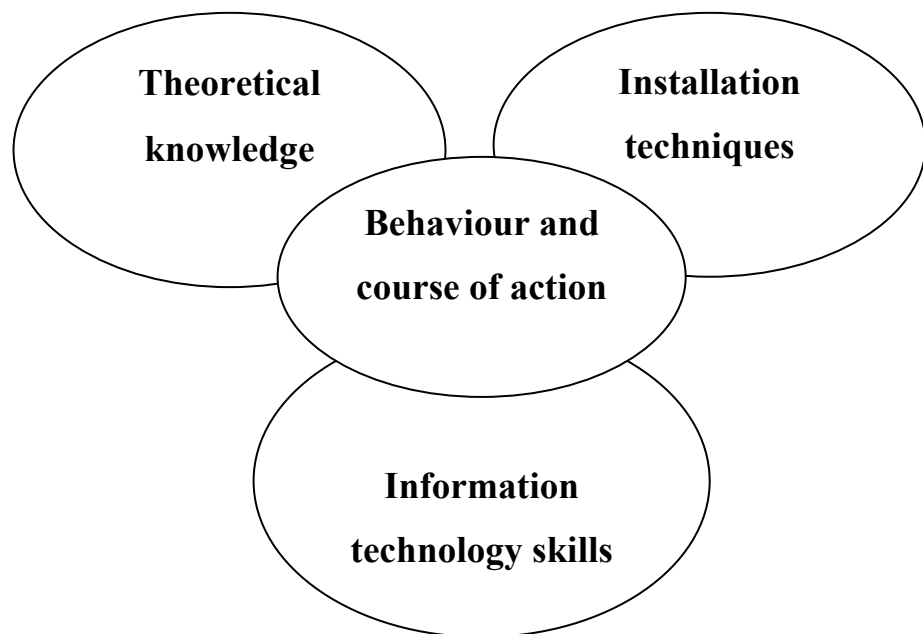


FIGURE 1. Central contents of the vocational studies during first two years.

Behaviour and course of action

The working life assumes that a student both observes working hours and integrates into the working community. The student takes given duties responsibly and has the related documents, tools, material and equipment in safe keeping. The student takes into consideration the sustainable development when he/she is handling tools, materials and equipment. The student also considers safety regulations and safe usage.

Information technology skills

The student produces and revises texts, tables and graphics into one single document. He/she knows how to use e-mail as a communication tool. The student can connect a basic computer peripheral and install or setup the needed software for studies.

Theoretical knowledge

The student can build basic electronic circuits from the familiar components. He/she is able to evaluate the functioning of a circuit or equipment based on the measured or calculated values , he/she can compare these values with reference values or target values. The student can make out a circuit diagram.

Installation techniques

The student performs electrical and mechanical installations on various surfaces or platforms according to given documents. He/she knows the different cable support systems and can install wires, cables and electrical equipment into these systems. When doing these installations the student chooses and uses different connection techniques observing the use conditions and classifications for boxing and space. The student can make construction, mechanical and electrical drawings. (Opetushallitus 2006, 6)

4 CURRICULUM

The Computer Hardware Structures course is 2,5 studying weeks. The curriculum requires that the student has to be able to assemble an ordered computer from standard parts. He/she has also to know the functioning of an operation system and how this is installed to the computer.

The other main issues in the course curriculum are that the student develops to independent searcher of information. He/she is also presumed to work responsibly and to observe working hours.

The main goal is the know-how about the principles and structures of a computer. (Oulun seudun ammattiopisto 2003, 43)

5 WORKING ENVIRONMENT FOR THE SKILLS DEMONSTRATION

The skills demonstrations can be carried out in the same premises or rooms which are used for the basic work in electrical engineering. The electronics field materials and service/installation documents are used during the performance. In general, the demonstrations are performed individually unless the task is especially for a pair or group. The scene of the demonstration has to be in accordance with the rules and regulations for safety at electrical work.

6 PROGRESS OF THE COURSE

The course expands over two periods. This means around sixteen weeks time and five hours per week. These five hours are successive. The theory is set up in a www-based learning environment. The students can initially do the theory tasks during the lessons as they did before when the manuals and textbooks as well as tasks were available only on paper. This is useful for further studies also because this course usually is their first experience in network studying. This also means that the theory part of the course shall be particularly carefully implemented in order to avoid possible future aversion to network learning. The teacher is spelling out the advice for the tasks to the students. Most of the students are quite quickly getting familiarized with this kind of studying – though some of them need more guidance. After a couple of weeks the majority of the group is able to finish the tasks independently from home computers or wherever the students are working. At this point we are ready to start the practical part.

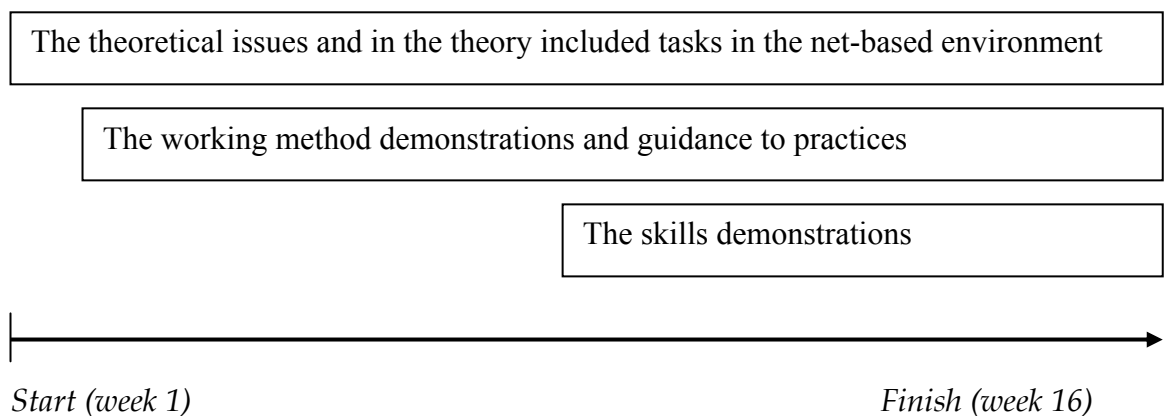


FIGURE 2. Time schedule of the course advancement.

An essential precondition for the demonstration is that the students prove their theoretical knowledge in a verbal or/and in a written exam. The skills

demonstrations are started about in the middle of the course, depending on a student's abilities to work with the theory.

7 PROGRESS OF THE SKILLS DEMONSTRATION

A. PRELIMINARY TEST

The student has to get familiarized with the mother board structure, the supplementary material is available. The student shall identify all parts and couplings that are described in the material, the teacher arranges a test about the mother board knowledge. Then the student's knowledge about tools and working methods is also checked. After this the student can start preparing for the competence demonstration.

B. ASSEMBLING THE COMPUTER

The task is to assemble a Personal Computer according to an order where the parts and components are listed. The teacher or/and an outside supervisor marks the work progress into a checklist. When the installation is completed, the computer case is left open and a start up test is done. The installation should be ready within one hour.

C. EVALUATION OF THE ASSEMBLY

The assembly is evaluated with help of an evaluation form. The evaluation is performed together with the student and supervisors. The evaluation scale is T1, T2, H3, H4 and K5, where T1 and T2 correspond to FAIR, H3 and H4 to GOOD and K5 to EXCELLENT.

D. OPERATING SYSTEM INSTALLATION

The student installs an ordered operating system to the computer. Then the system is checked to make sure that it is functioning.

E. EVALUATION OF THE OS INSTALLATION

The operation system installation is also evaluated with help of the evaluation form together with the student and supervisors. The scale is the same as it was for the assembly.

F. STATEMENT

The student presents the computer composition to the supervisors. He/she tells what kind of features it has, what use it has or can have.

G. FINAL STAGE

The student formats the hard disk and takes the computer into pieces. The components are packed back to the original packages and moved to their storing place.

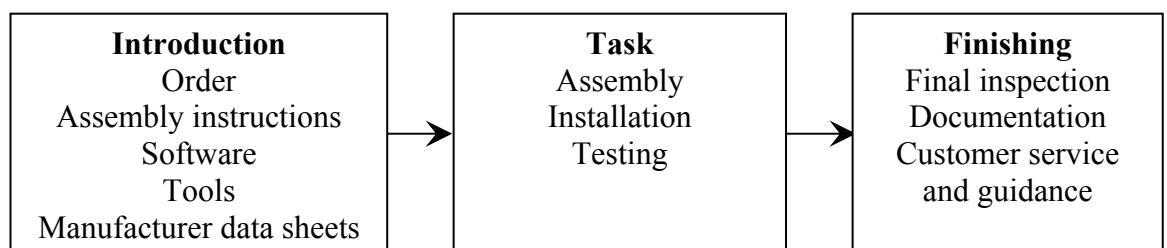


FIGURE 3. Skills demonstration contents and advancement.

8 THE COURSE EVENTS

The course started in February 2007. There were sixteen students taking part in the course and two teachers were tutoring the students. We had the lessons in a big classroom with 20 computer workstations and 10 separate work desks. The classroom is ideal for working with computers both using them as tools and doing the assembly work. The workstation computers are not used in assembling work – we have different hardware for that purpose.

During the first sessions the students got acquainted with the Moodle learning environment. There is set up a handbook about personal computer techniques in pdf-format in the Moodle (PC-tekniikka, Training Kit A+ -tutkinto). The students got quite rapidly used to work out the tasks in the system. Some of the students worked independently and the others required help – they could not find the answers or they did not understand the questions.

The first students were ready with the theory tasks after three weeks, so we started to prepare them for the skills demonstration experiment. They got older personal computers to train with. The students got those into pieces and they were told how to use tools and how to handle components. All the parts that are sensitive to static electricity were place on an ESD-protected pad (see figure 4.). After doing this the students had an opportunity to get information on all the components they had disassembled from the computer. They had some manuals in the classroom in paper version, some data sheets they could download from the Internet. The students studied the components, how they shall be assembled, whatever there was special about any of those. They wrote down the components' data on a form. The teachers were guiding them during this process. After that the teacher asked questions about the job and after this

test the students assembled the computers again – in other words they went through the skills demonstration work flow or process.



FIGURE 4. Detached computer components on an ESD-pad on a work desk.

In the seventh week of the course we had the first “real” demonstrations. Two students started their performance according to the directions under surveillance of the two teachers. One student assembled his computer in half an hour, the other used almost one and a half hours and he asked some advice during the work. The time limit was agreed to one hour and asking help was allowed, though lowering the mark. After finished assembly the work itself was evaluated and the students continued to the second part of the demonstration. This took about one hour. The students presented their computers and the evaluation was done. After the evaluation they put the computers back into pieces according to the instructions. The evaluation marks were fed into the computer system – the real thing starts next year so we did not need to fill the official papers. The evaluation form is in the appendices (Appendix 2).

Ten students have done their competence test by the fourteenth week of the course. Some of them had a few unfinished theoretical tasks, we were bending our rules in this case. One of the students has not done the tasks and he has had repeated absences from the school, he is in fact starting the second year studies over again next school year.

The results of the performances were quite satisfactory: two students got the mark fair, five students had the mark good and three got the best mark excellent. The students have also filled a feed-back form after the skills demonstration and the results are handled later in the text.

9 THE FEED-BACK FROM THE PARTICIPANTS

The feed-back on the skills demonstration or the competence test was collected after the last performance. The feed-back form was modified from our school's ordinary form to fit this purpose. The original form is in the appendices (Appendix 4). The form has six sections where there are claims and the participants mark their opinion on following scale:

- 1 = I don't agree at all
- 2 = I agree to some extent
- 3 = I agree quite a lot
- 4 = I fully agree
- 0 = no experience about

The topics and arguments:

Orientation to the test instructions and consideration of learning abilities

1. I knew the objective of the skills demonstration before the performance

2. The participants agreed with the teacher on how the demonstrations are done
3. I knew the assessment criteria
4. I had a possibility to show my previous know-how

Teaching and orientation methods

5. The teaching was demonstrative
6. I had a possibility to practice enough before the demonstration
7. The given tasks support my goals in my studies
8. The demonstration contents was adequate to the goals
9. I understood how the demonstration is connected to working life / my future work

Atmosphere in the class

10. The atmosphere in the lessons was good and encouraging
11. It was easy to contact the teacher
12. Cooperation with my classmates supported my learning
13. In the lessons we could work in peace as the studying requires

Feedback

14. The teacher supported me with tutoring feedback
15. I had opportunities to give feedback to the teacher

The student's role / self assessment

16. I set my goals in the beginning of the course
17. I reached well my goals for my learning
18. I took actively part into the course
19. I acted according to agreements during the course (absences etc.)

Other

20. I can assemble a computer better than before the course
21. My knowledge about computers has increased during the course

10 THE FEEDBACK SUMMARY AND CONSIDERATION

The feedback answers summary can be found in the appendices (appendix 3). The arguments in the form are favourable statements which describe various goals and conditions of the course. Whenever there are opinions in the category 1 (I don't agree at all) or 2 (I agree to some extent) in the feedback it is an alerting point. According to this inquiry the working peace and the demonstrative teaching are the first subjects to be improved as well as the learning material or computer components.

The students also have commented the course:

- “ - the teaching was too difficult to understand. I couldn't follow it, the new things came too fast.
- there were too many theory lessons in row.
- the assembly was the best part of the course.
- too old information. I do not care about old ISA buses etc. I would like to learn new things and there should be more writing tasks.
- I want more to do with my hands in other courses, too.
- more new technology, too much ISA-buses and SIMM things.
- I knew everything and I did not like it because there were too little tasks and the tasks I had were about antique computers.
- the tasks were old, but it was nice to build computers.”

We discussed with the students about these comments. The comments and the verbal feedback express that there is a need to modernize the contents, even though the material is only from a couple years back. Since the sphere is one of the fastest developing it is necessary to make it more flexible and more open to new technology. The problem is that the material is out-of-date quite soon and it is expensive, too. It is then not reasonable to require the students to buy expensive books, when it is obvious that a new revision comes out within next

two years. Many students have modern computers at home, they are used to acquire the most modern equipment as soon it comes available. The basic principles, functions and hardware are though still the same and the most students are aware of that fact or they realise it when explained.

The students did like the skills demonstration as an idea in the first place. They were more than willing to train for the test. They asked if the time was one of the criteria in the final assessment. The students wanted to compete about best performance as in a competition. This enthusiasm should be utilized in the teaching and make the skills demonstration a competition within the class. The winners could have some small prize and the glory, of course. All in all, a skills demonstration is a self-evident part of this course. In other words, one of the existing course modules is modified into a competence test, it is documented, made universal, comparable and possible to assess equally.

To make the competence test more up-to-date we should acquire a variety of different components in cooperation with real companies' representatives, we should also inquire them of the needs in the working life.

SOURCES

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APPENDICES

1. Extract from Opetussuunnitelma, OSAO, Myllytulli, 2003
2. Assessment form
3. Feedback answers
4. Feedback form

3.2.5.4 Tietokonelaitteiden rakenne, 2,5 ov (141.04)

TAVOITTEET

Opiskelija osaa tietokonejärjestelmän toimintaperiaatteet. Hänen on osattava tietokonejärjestelmien kategoriat: mikro- ja sulautetut tietokoneet ja henkilökohtaiset tietokoneet ja tietokonejärjestelmät, sekä oheislaitteiden elektroniset rakenneperiaatteet ja henkilökohtaisten tietokoneiden toimintaperiaatteet ja niihin liittyvän teollisuusstandardin.

Opiskelijan on osattava koota teollisuusstandardin mukaisista osista asiakkaan määrittelemän tietokoneen. Hallitsee käyttöjärjestelmän toiminnan ja sen asentamisen tietokoneeseen. Opiskelijan on osattava yleisimpien oheiskorttien asentaminen toimivaan tietokoneeseen, tiedettävä ulkoisten oheislaitteiden periaatteet sekä osattava niiden liittäminen ja käyttöönoton toimivaan tietokonejärjestelmään. Opiskelija kehittyy itsenäiseksi tiedon hakijaksi ja työskentelee vastuullisesti noudattaen työaikoja.

Keskeinen tavoite on tietokoneen toimintaperiaatteiden ja rakenteen osaaminen.

SISÄLLÖT

- tietokonejärjestelmän toimintaperiaate
- tietokonejärjestelmien jaottelu
- levykeaseman, kiintolevyn, DVD-aseman ja näytönohjaimen toimintaperiaate
- PC:n toimintaperiaate
- PC:n IO-liitännät
- PC:n väylätyypit
- PC:n kokoaminen osista
- käyttöjärjestelmän asentaminen ja perushallinta
- oheiskortin esim. näytönohjain asentaminen toimivaan tietokoneeseen
- näytön, tulostimen ja kuvanlukijan toimintaperiaate
- ulkoisen oheislaitteen esim. tulostin/kuvanlukija liittäminen ja käyttöönotto

ARVIOINTI

Kiitettävä (K5)

Tavoitteissa ilmaistu osaaminen.

Hyvä (H4)

Opiskelijalla on osittain parempaa osaamista kuin H3-taso edellyttää, muttei vielä yllä kiitettävään (K5) tasoon. Opiskelija osoittaa työskentelyssään omatoimisuutta, tiedonhalua ja kriittisyyttä.

Hyvä (H3)

Opiskelija

- osaa tietokonejärjestelmien toimintaperiaatteita
- osaa tietokonejärjestelmien kategoriat: mikro- / sulautetut, henkilökohtaiset tietokoneet ja tietokonejärjestelmät
- tietää ulkoisten oheislaitteiden toimintaperiaatteet
- osaa pienen neuvonnan avulla ulkoisten oheislaitteiden liittäminen ja käyttöönoton toimivaan tietokonejärjestelmään
- osaa pienen neuvonnan avulla koota teollisuusstandardin mukaisista osista asiakkaan määrittelemän tietokoneen
- hallitsee käyttöjärjestelmän ja käyttöjärjestelmään tukeutuvan ohjelman asentamisen tietokoneeseen
- osaa noudattaa työaikoja ja työskenneltävä vastuullisesti 8mm. koti-/etätehtävät).

Tyydyttävä (T2)

Opiskelijalla on osittain parempaa osaamista kuin T1-taso edellyttää, muttei vielä yllä hyvään (H3) tasoon. Opiskelija osoittaa myönteistä asennetta, vastuuta ja aktiivista osallistumista opiskeluun.

Tyydyttävä (T1)

Opiskelija

- osaa tietokonejärjestelmien toimintaperiaatteita
- osaa tietokonejärjestelmien kategoriat: mikro- / sulautetut, henkilökohtaiset tietokoneet ja tietokonejärjestelmät
- hallitsee neuvonnan avulla käyttöjärjestelmän ja käyttöjärjestelmään tukeutuvan ohjelman asentamisen tietokoneeseen
- osaa neuvonnan avulla ulkoisen oheislaitteen liittämisen ja käyttöönoton toimivaan tietokonejärjestelmään
- osaa noudattaa työaikoja.

ARVIOINTITAPA

Opiskelija: itsearviointi

Opettaja: kirjalliset kokeet ja pienet testit, jatkuva näyttö, tehtävät, harjoitus-/projektityöt

TOTEUTTAMISTAPA

Oppimateriaali

- alan ajankohtaiset oppikirjat ja opettajan tuottama materiaali

Opetusjärjestelyt

- käytetään opiskelijakeskeisiä työtapoja: keskustelevaa opetusta, henkilökohtaista ohjausta
- opiskelussa käytetään sopivia apuvälineitä: Internet, laiterakentaminen ja asentamiseen liittyvät laitteet
- työskennellään itsenäisesti ja pareittain
- opiskelijan etenemistä opinnoissa tuetaan erilaisilla kotitehtävillä
- lähiopetus n. 30 h / 1 ov ja itsenäistä opiskelua n. 10 h / 1 ov

| | | |
|---|---|-----------------------|
| Nimi | Syntymäaika | Yksikkö Myllytulli |
| Tutkinto Sähköalan perustutkinto | Opintokokonaisuus Elektroniikan ja tietoliikenteen perusosaaminen | |
| Näytettävänä o Koko opintokokonaisuus X Opintokokonaisuuden osa o Näytön uusinta | Näytön ajankohta (alkaa pppkkvv- päättyy pppkkvv) Toisen opiskeluvuoden aikana | |
| Näyttöpaikan nimi OSAO, Myllytullin yksikkö | o Työssäoppimisjaksolla x Oppilaitoksessa o Muualla | |
| Työpaikkaohjaaja, näytön arvioija | Ohjaava opettaja | |

Kuvaus näytöstä (Tavoitteet, työtehtävät, työvälineet, ympäristö, muuta huomioitavaa)

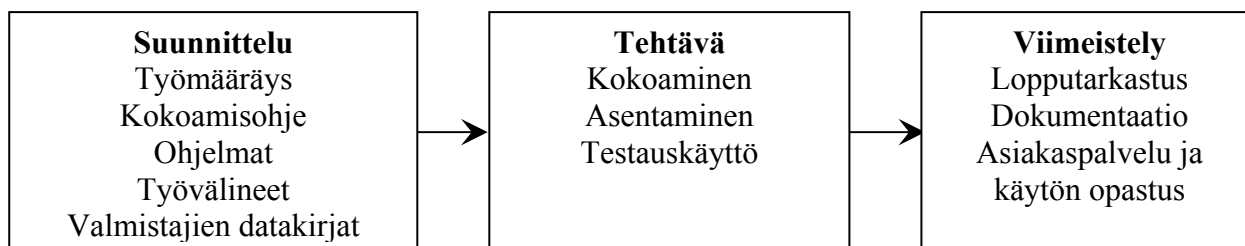
Näyttö N2a

Tietokonelaitteiston kokoaminen ja käyttöönotto. Käyttöjärjestelmän asentaminen ja koneen liittäminen verkkoon.

Tavoitteet

Näytössä keskitytään työprosessin ja kaikille aloille yhteisen ydinosaamisen osaamiseen arviointiin. Opiskelija näyttää osaamisen PC-koneen kokoamisessa siten, että hän osaa koota laitteiston komponenteista, asentaa tarvittavat ohjelmat ja ottaa laitteiston käyttöön.

Työn kulku



Arviointi (OPH:n ohjeen mukaisesti)

| Arvioinnin kohteet | Opiskelijan itsearviointi | Työelämän edustaja | Opettaja | Työelämän edustajan ja opettajan yht. arv. |
|--|---------------------------|--------------------|----------|--|
| 1. Työprosessin hallinta | | | | |
| 2. Työtehtävän hallinta | | | | |
| 3. Työn perusteena olevan tiedon hallinta | | | | |
| 4. Työturvallisuuden hallinta | | | | |
| 5. Kaikille aloille yhteinen ydinosaaminen | | | | |
| 6. Kaikille aloille yhteiset painotukset | | | | |
| | | | | |

Perusteluja

Suunnitelma näytön täydentämisestä/uusimisesta annetaan tarvittaessa omalla liitteellä

Allekirjoitukset (Arviointitoimikunta 11§/2006, Ammattiosaamisen näytön arvioinnista päättäminen)

| | |
|---------|--|
| Päiväys | Opiskelijan allekirjoitus ja nimen selvennys |
| Päiväys | Työelämän edustajan, näytön arvioijan allekirjoitus ja nimen selvennys |
| Päiväys | Ohjaavan opettajan allekirjoitus ja nimen selvennys |

Säilytys arkistointiohjeen mukaan.

Jakelu:

o Opiskelija

o

o _____ o _____

Näytön arviointi

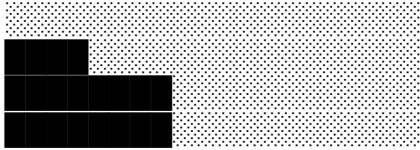
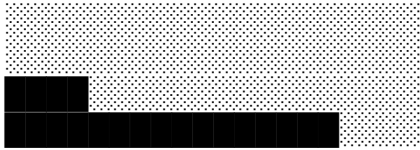
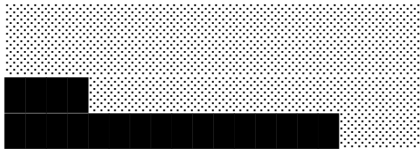

| Arvioinnin kohteet | Arviointikriteerit | | |
|--|---|---|---|
| | TYDYTTÄVÄ (T1) | HYVÄ (H3) | KIITETTÄVÄ (K5) |
| | Opiskelija | Opiskelija | Opiskelija |
| Työprosessin hallinta Tietokoneen rakenteiden hallinta | kokoaa tietokoneen ja asentaa siihen käyttöjärjestelmän ja sovellusohjelman. | tekee tietokoneen testaukseen liittyviä mittauksia ja tulkitsee niitä. | asentaa lisäkortteja ja oheislaitteita tietokoneeseen. |
| Työtehtävän hallinta Tietokoneen rakenteiden hallinta | Kokoaa tietokoneen Testaa tietokoneen toiminnan Asentaa tietokoneeseen tarvittavia ohjelmia | Suorittaa tarvittavat testaukset tuntee selaimen toimintaperiaatteen | Liittää oheislaitteita tietokoneeseen ja ottaa ne käyttöön. |
| Työn perustana olevan tiedon hallinta Tietokoneen rakenteiden hallinta | käyttää komponenttien datatietoja. | valitsee oikean piiriperheen käyttötarkoituksen mukaan. | tuntee erilaisia datatietojen etsintään tarvittavia menetelmiä. |

| | | | |
|--|--|---|--|
| <p>Työturvallisuuden hallinta</p> | <p>tuntee ESD- suojauksen.</p> <p>noudattaa alan tehtävien työturvallisuusohjeita.</p> | <p>tuntee jonkin datatietojen etsintätavan.</p> <p>tuntee tietokoneiden oheislaitteiden toiminnan perusteet</p> <p>tuntee selaimen toimintaperiaatteen.</p> | <p>hallitsee monipuolisesti tietokoneen ja siihen liitettävät oheislaitteet.</p> <p>noudattaa kokoonpano- ja asennustyöhön liittyviä sähköturvallisuusvaatimuksia voimassa olevien määräyksien mukaan.</p> |
| <p>Yhteiset painotukset</p> | | <p>selostaa asiakkaalle järjestelmän toimintaperiaatteet.</p> | <p>opastaa asiakasta järjestelmän käytössä.</p> |

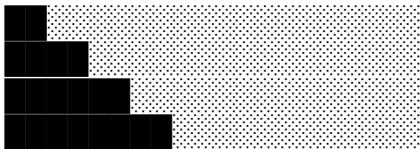
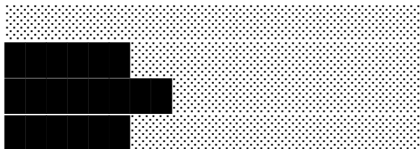

| Objects | Assessment criteria | | |
|------------------------------------|---|--|---|
| | FAIR (T1) | GOOD (H3) | EXCELLENT (K5) |
| | Student | Student | Student |
| Working process | accomplishes the task according to the instructions. | is able to see the task as a whole and makes a plan to do it and evaluates the own performance | can get the priorities right, find fresh solutions and solve conflicting situations.. |
| Task control | assembles the computer and tests its function. installs an operating system and an application software. | can locate where a possible fail is in the computer. connects a given peripheral and installs it. changes a mother board and setup configurations. installs one operating system and makes use of its features. | assembles the given extension cards to right places. connects and installs peripherals and takes those in use. |
| Mastery of the basic theory | knows how a computer works in principle. knows the significance of the ESD-protection | knows how computer peripherals work in principle. can explain the meaning, structure and principles of the computer buses. | |
| Common emphasizing | considers the customer's definitions. | can explain the system principles to the customer. | takes customer's needs in consideration. |

The feedback answers


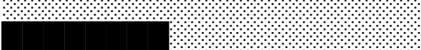



Orientation to the test instructions and consideration of learning abilities

1. I knew the objective of the skills demonstration before the performance
- | | | |
|----------------------------|--|----------------|
| 1 = I don't agree at all |  | 0 / 10 answers |
| 2 = I agree to some extent | | 2 / 10 answers |
| 3 = I agree quite a lot | | 4 / 10 answers |
| 4 = I fully agree | | 4 / 10 answers |
2. The participants agreed with the teacher on how the demonstrations are done
- | | | |
|----------------------------|--|----------------|
| 1 = I don't agree at all |  | 0 / 10 answers |
| 2 = I agree to some extent | | 0 / 10 answers |
| 3 = I agree quite a lot | | 2 / 10 answers |
| 4 = I fully agree | | 8 / 10 answers |
3. I knew the assessment criteria
- | | | |
|----------------------------|--|----------------|
| 1 = I don't agree at all |  | 0 / 10 answers |
| 2 = I agree to some extent | | 0 / 10 answers |
| 3 = I agree quite a lot | | 2 / 10 answers |
| 4 = I fully agree | | 8 / 10 answers |
4. I had a possibility to show my previous know-how
- | | | |
|----------------------------|---|----------------|
| 1 = I don't agree at all |  | 0 / 10 answers |
| 2 = I agree to some extent | | 2 / 10 answers |
| 3 = I agree quite a lot | | 2 / 10 answers |
| 4 = I fully agree | | 6 / 10 answers |






Teaching and orientation methods

5. The teaching was demonstrative
- | | | |
|----------------------------|--|----------------|
| 1 = I don't agree at all |  | 1 / 10 answers |
| 2 = I agree to some extent | | 2 / 10 answers |
| 3 = I agree quite a lot | | 3 / 10 answers |
| 4 = I fully agree | | 4 / 10 answers |
6. I had a possibility to practice enough before the demonstration
- | | | |
|----------------------------|--|----------------|
| 1 = I don't agree at all |  | 0 / 10 answers |
| 2 = I agree to some extent | | 3 / 10 answers |
| 3 = I agree quite a lot | | 4 / 10 answers |
| 4 = I fully agree | | 3 / 10 answers |
7. The given tasks support my goals in my studies
- | | | |
|----------------------------|--|----------------|
| 1 = I don't agree at all |  | 1 / 10 answers |
| 2 = I agree to some extent | | 2 / 10 answers |
| 3 = I agree quite a lot | | 5 / 10 answers |
| 4 = I fully agree | | 2 / 10 answers |

8. The demonstration contents was adequate to the goals





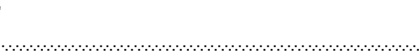
| | | |
|----------------------------|--|----------------|
| 1 = I don't agree at all |  | 0 / 10 answers |
| 2 = I agree to some extent |  | 0 / 10 answers |
| 3 = I agree quite a lot |  | 4 / 10 answers |
| 4 = I fully agree |  | 6 / 10 answers |
| 0 = no experience about |  | 0 / 10 answers |

9. I understood how the demonstration is connected to working life / my future work





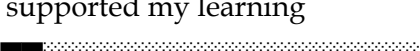
| | | |
|----------------------------|--|----------------|
| 1 = I don't agree at all |  | 0 / 10 answers |
| 2 = I agree to some extent |  | 0 / 10 answers |
| 3 = I agree quite a lot |  | 2 / 10 answers |
| 4 = I fully agree |  | 8 / 10 answers |
| 0 = no experience about |  | 0 / 10 answers |

Atmosphere in the class





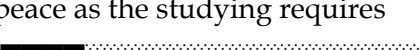
10. The atmosphere in the lessons was good and encouraging

| | | |
|----------------------------|--|----------------|
| 1 = I don't agree at all |  | 1 / 10 answers |
| 2 = I agree to some extent |  | 2 / 10 answers |
| 3 = I agree quite a lot |  | 2 / 10 answers |
| 4 = I fully agree |  | 5 / 10 answers |
| 0 = no experience about |  | 0 / 10 answers |





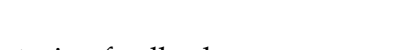
11. It was easy to contact the teacher

| | | |
|----------------------------|--|----------------|
| 1 = I don't agree at all |  | 0 / 10 answers |
| 2 = I agree to some extent |  | 1 / 10 answers |
| 3 = I agree quite a lot |  | 2 / 10 answers |
| 4 = I fully agree |  | 7 / 10 answers |
| 0 = no experience about |  | 0 / 10 answers |

12. Cooperation with my classmates supported my learning






| | | |
|----------------------------|--|----------------|
| 1 = I don't agree at all |  | 1 / 10 answers |
| 2 = I agree to some extent |  | 1 / 10 answers |
| 3 = I agree quite a lot |  | 5 / 10 answers |
| 4 = I fully agree |  | 3 / 10 answers |
| 0 = no experience about |  | 0 / 10 answers |

13. In the lessons we could work in peace as the studying requires

| | | |
|----------------------------|--|----------------|
| 1 = I don't agree at all |  | 2 / 10 answers |
| 2 = I agree to some extent |  | 2 / 10 answers |
| 3 = I agree quite a lot |  | 4 / 10 answers |
| 4 = I fully agree |  | 2 / 10 answers |
| 0 = no experience about |  | 0 / 10 answers |

Feedback

14. The teacher supported me with tutoring feedback

| | | |
|----------------------------|--|----------------|
| 1 = I don't agree at all |  | 1 / 10 answers |
| 2 = I agree to some extent |  | 1 / 10 answers |
| 3 = I agree quite a lot |  | 2 / 10 answers |
| 4 = I fully agree |  | 6 / 10 answers |
| 0 = no experience about |  | 0 / 10 answers |

15. I had opportunities to give feedback to the teacher

- 1 = I don't agree at all
- 2 = I agree to some extent
- 3 = I agree quite a lot
- 4 = I fully agree
- 0 = no experience about

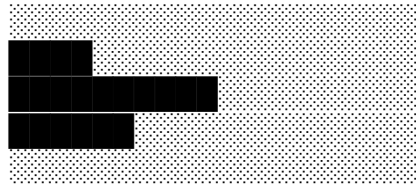


- 0 / 10 answers
- 1 / 10 answers
- 2 / 10 answers
- 7 / 10 answers
- 0 / 10 answers

The student's role / self assessment

16. I set my goals in the beginning of the course

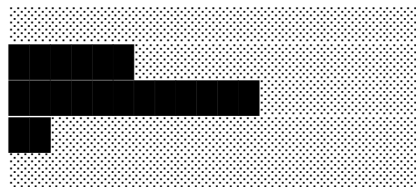
- 1 = I don't agree at all
- 2 = I agree to some extent
- 3 = I agree quite a lot
- 4 = I fully agree
- 0 = no experience about



- 0 / 10 answers
- 2 / 10 answers
- 5 / 10 answers
- 3 / 10 answers
- 0 / 10 answers

17. I reached well my goals for my learning

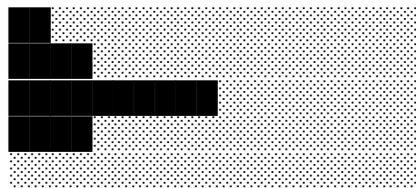
- 1 = I don't agree at all
- 2 = I agree to some extent
- 3 = I agree quite a lot
- 4 = I fully agree
- 0 = no experience about



- 0 / 10 answers
- 3 / 10 answers
- 6 / 10 answers
- 1 / 10 answers
- 0 / 10 answers

18. I took actively part into the course

- 1 = I don't agree at all
- 2 = I agree to some extent
- 3 = I agree quite a lot
- 4 = I fully agree
- 0 = no experience about



- 1 / 10 answers
- 2 / 10 answers
- 5 / 10 answers
- 2 / 10 answers
- 0 / 10 answers

19. I acted according to agreements during the course (absences etc.)

- 1 = I don't agree at all
- 2 = I agree to some extent
- 3 = I agree quite a lot
- 4 = I fully agree
- 0 = no experience about



- 1 / 10 answers
- 0 / 10 answers
- 2 / 10 answers
- 7 / 10 answers
- 0 / 10 answers

Other

20. I can assemble a computer better than before the course

- 1 = I don't agree at all
- 2 = I agree to some extent
- 3 = I agree quite a lot
- 4 = I fully agree
- 0 = no experience about



- 1 / 10 answers
- 2 / 10 answers
- 2 / 10 answers
- 5 / 10 answers
- 0 / 10 answers

21. My knowledge about computers has increased during the course

- 1 = I don't agree at all
- 2 = I agree to some extent
- 3 = I agree quite a lot
- 4 = I fully agree
- 0 = no experience about



- 1 / 10 answers
- 1 / 10 answers
- 1 / 10 answers
- 7 / 10 answers
- 0 / 10 answers

| | |
|--|--|
|  OULUN SEUDUN AMMATTIOPISTO | <h2 style="margin: 0;">PALAUTE NÄYTÖN SUORITTAMISESTA</h2> |
|--|--|

Päivämäärä _____ / _____ 200 _____

OSAO:n yksikkö MYLLYTULLIN YKSIKKÖ

Ryhmä ELE05E

Arvioitava näyttö Tietokoneen kokoaminen ja käyttöönotto

Opintojakson opettaja _____

Palautteen tarkoitus

Palautteella kootaan tietoa näytön kehittämistä ja opiskelijan oppimisen edistämistä varten.

Tulosten käsittely

Palautteen tulokset lasketaan yhteen ja opettaja käsittelee ne ryhmän kanssa yhdessä.

Vastausohje ja asteikko

Valitse rastittamalla kunkin kysymyksen kohdalta se vaihtoehto, joka eniten vastaa kokemustasi. Jos sinulla ei ole kokemusta kysyttävästä asiasta, niin rastita 0.

Merkitse vain yksi vaihtoehto kysymystä kohden. Lisäksi voit kirjoittaa vastauksiesi perusteluita tai kommentteja jokaiseen aihealueeseen.

- 1 = en ole lainkaan samaa mieltä
 2 = olen jokseenkin samaa mieltä
 3 = olen melko paljon samaa mieltä
 4 = olen täysin samaa mieltä
 0 = ei kokemusta asiasta

1 = en ole lainkaan samaa mieltä
 2 = olen jokseenkin samaa mieltä
 3 = olen melko paljon samaa mieltä
 4 = olen täysin samaa mieltä
 0 = ei kokemusta asiasta

Näyttösuunnitelmaan perehtyminen sekä oppimisen edellytysten huomioonottaminen

| | | | | | |
|--|---|---|---|---|---|
| 1. Näytön tavoitteet olivat tiedossani ennen näyttöä | 1 | 2 | 3 | 4 | 0 |
| 2. Ryhmä sopi opettajan kanssa näyttöjen toteutuksesta | 1 | 2 | 3 | 4 | 0 |
| 3. Tiesin näytön arviointiperusteet | 1 | 2 | 3 | 4 | 0 |
| 4. Minulla oli mahdollisuus tuoda esille aikaisempi osaamiseni | 1 | 2 | 3 | 4 | 0 |

Perustelut / kommentit _____

jatkuu...

Asteikko

| | | |
|----------------------------------|------------------------------------|--------------------------|
| 1 = en ole lainkaan samaa mieltä | 3 = olen melko paljon samaa mieltä | 0 = ei kokemusta asiasta |
| 2 = olen jokseenkin samaa mieltä | 4 = olen täysin samaa mieltä | |

Opetus- ja perehdytysmenetelmät

| | | | | | |
|---|---|---|---|---|---|
| 5. Opetus oli havainnollista | 1 | 2 | 3 | 4 | 0 |
| 6. Ennen näyttöä minulla oli mahdollisuus kokeilla ja harjoitella riittävästi | 1 | 2 | 3 | 4 | 0 |
| 7. Annetut tehtävät tukivat oppimistavoitteitteni saavuttamista | 1 | 2 | 3 | 4 | 0 |
| 8. Näytön aihe ja sisältö oli tavoitteisiin nähden sopiva | 1 | 2 | 3 | 4 | 0 |
| 9. Ymmärsin miten näyttö liittyy työelämään / tulevaan ammattiini | 1 | 2 | 3 | 4 | 0 |

Perustelut / kommentit _____

Työskentelyilmapiiri

| | | | | | |
|---|---|---|---|---|---|
| 10. Ilmapiiri tunneilla oli hyvä ja kannustava | 1 | 2 | 3 | 4 | 0 |
| 11. Opettajan puoleen kääntyminen oli helppoa | 1 | 2 | 3 | 4 | 0 |
| 12. Yhteistyö luokatovereiden kanssa edisti oppimistani | 1 | 2 | 3 | 4 | 0 |
| 13. Oppitunneilla oli opiskelussa vaadittava työrauha | 1 | 2 | 3 | 4 | 0 |

Perustelut / kommentit _____

Palautteen antaminen

| | | | | | |
|---|---|---|---|---|---|
| 14. Sain ohjaavaa palautetta opettajalta | 1 | 2 | 3 | 4 | 0 |
| 15. Minulla oli mahdollisuus antaa opettajalle palautetta | 1 | 2 | 3 | 4 | 0 |

Perustelut / kommentit _____

Opiskelijan oma rooli / itsearviointi

| | | | | | |
|---|---|---|---|---|---|
| 16. Asetin itselleni tavoitteet kurssin alussa | 1 | 2 | 3 | 4 | 0 |
| 17. Saavutin oppimiselleni asettamani tavoitteet hyvin | 1 | 2 | 3 | 4 | 0 |
| 18. Oma osallistumiseni kurssille oli aktiivista | 1 | 2 | 3 | 4 | 0 |
| 19. Jakson kuluessa toimin sopimusten mukaisesti (mm. poissaolojen suhteen) | 1 | 2 | 3 | 4 | 0 |

Perustelut / kommentit _____

Muita asioita

| | | | | | |
|--|---|---|---|---|---|
| 20. Osaan tarvittaessa koota tietokoneen paremmin kuin ennen | 1 | 2 | 3 | 4 | 0 |
| 21. Tietokoneen tuntemiseni on lisääntynyt kurssin aikana | 1 | 2 | 3 | 4 | 0 |

Perustelut / kommentit _____

Kiitos vastauksistasi!