

ICT-skills of ship personnel

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Abstract

The aim of this thesis was to find out if the ICT-skills of crewmembers on Finnish vessels are adequate for their work, problems they have with computer hardware or software, and if they consider the amount of education in ICT-related subjects to be enough as of now.

A web questionnaire was made for the thesis and distributed to Finnish shipping companies HR-departments to forward to their vessels or sea personnel.

Half of the responders considered their ICT education adequate for their work and a third of them would like to have additional training or familiarization. A few had received some training after their graduation, but this was not common.

Language: English

Key Words: ICT, seafaring, information technology

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Abstrakt

Syftet av det här examensarbetet var att reda ut om besättningen på finska fartyg har tillräckliga ICT-kunskaper med hänsyn till arbetets krav, vad för slags problem dom har med datorer och datorprogram och om utbildningen i läroinstituten är tillräcklig.

Jag gjorde en frågeformular för arbetet som jag skickade åt finska rederiernas personalavdelningar och frågade om dom kan skick den framåt åt deras fartyg eller sjöpersonell.

Hälften av dom som svarade tyckte att de fått tillräckligt bra utbildning i ICT-ämnena. En tredjedel skulle vilja ha mera utbildning eller introduktion. Några hade fått träning efter sin utexaminering, men det var sällsynt.

Språk: Engelska

Nyckelord: IKT, sjöfart, informationsteknik

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Tiivistelmä

Opinnäytetyön tavoitteena oli selvittää onko suomeen liputettujen alusten miehistön ICT-aidot riittävät työn vaatimuksiin nähden, mitä ongelmia heillä on tietokoneiden ja tietokoneohjelmien kanssa ja onko oppilaitoksissa tarjottu opetus riittävää.

Työtä varten tein kyselylomakkeen jonka lähetin varustamojen henkilöstösastoille ja pyysin lähettämään eteenpäin laivoille tai merihenkilöstölle.

Puolet vastaajista piti saamaansa opetusta riittävänä työn vaatimuksiin nähden. Kolmannes tahtosi lisäkoulutusta tai perehdytystä. Muutama vastaaja oli saanut ICT-koulutusta valmistumisensa jälkeen, mutta se oli melko harvinaista.

Kieli: Englanti

Avainsanat: ATK, merenkulku, tietotekniikka

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1 Introduction

Today there is very little that is done without computers and ICT-technology, and the maritime sector is no exception. The amount of ICT-technology, computers and sensors is going to increase in the future (*Michaelides et al, 2021*). Apart from cellphones in port and near the coast and satellite phones further from land, almost all communication is done by email. Stability calculations and cargo plans are done with a loading program, charts are electronic and route planning is done on the ECDIS-systems, work hour planning and reporting are done with computers as is ordering items to the ship and inventory management of spare parts and equipment.

During my education we had one ICT-course that included basic computer use, sending emails, and using Microsoft Office-products. Also, while working as an officer onboard, there has been very little training for existing or new programs. Manuals are often outdated, and the vessels received new computerized systems and programs after which the crew had to mostly train themselves to use them and if help was needed, ask other crew members, friends, or other company vessels if they have a solution to the problem at hand, or how to use the program.

Several people that I spoke to had similar experiences, which made me interested in the general situation of ship personnel's skills with computers, and problems that arise either from the programs or users.

For this thesis I made a questionnaire that I sent to Finnish shipping companies and asked them to forward the questionnaire to their vessels. I also sent the questionnaire to some people that I knew who worked on ships. The questionnaire was available in Finnish and English, so for the sake of clarity I combined the answers from both language versions for the charts used in this thesis. Both complete questionnaires are separately available as annexes.

1.1 Background

The aim of this thesis was to find out if crewmembers on Finnish ships consider their ICT-competence to be on an adequate level compared to what their work requires. Based on

my own experiences and experiences of coworkers and friends at sea, computer use is a large part of work onboard, and it is rare for anyone to have time to properly teach the use of computer software. When I started working on my current vessel, I was the youngest crewmember, and often my coworkers asked me for help with computers "because you're young and understand how these work". Often I could be of help and sometimes not. I was also interested in the level of ICT-support available to crews of Finnish ships. My employer has support personnel working in the company office, and they are available during office hours, but usually they are only contacted as a last resort and the crew tries to first solve any problems they have by themselves.

In relation to the level of competence ships crews consider that they have, I also wanted to find out if they consider their education sufficient to the demands they face in their work. Of course as there are several programs available for different purposes, teaching the use of all possible maritime programs is hardly possible. Educational facilities should however offer a good enough basic understanding that can be expanded upon.

Finally I also wanted to find out whether ships personnel would like more education in ICT-subjects already during their education, more training or familiarization from their employer or if they consider the present situation satisfactory. The curriculums of Finnish maritime Universities of Applied Sciences have one ICT-course, and depending on the facility it is 1,5-3 credits. The contents are more or less the same in all UAS:s and consist mainly of using Microsoft Windows, basics of information technology, using Microsoft Office products and using the Internet and e-mail (*novia.fi, 2022, xamk.fi, 2022*).

The research questions for this thesis are:

1. Does the crewmembers consider their ICT-skills to be adequate for their work?
2. Do they consider their education regarding ICT satisfactory?
3. Do they wish for more support or education?

1.1.1 My own experiences

Below are some problems found on the vessel I work on, and solutions that have been found to them as examples. These are all programs that are mentioned in the questionnaires answers and hopefully they give some insight into common problems.

Microsoft Office is a family of productivity software that includes programs for word processing, spreadsheets, presentations, etc. (*microsoft.com, 2022*). Basic use of the software is quite simple but there are many advanced features aswell.

On the vessel, there is an Excel spreadsheet that is programmed with Visual Basic to calculate work and resthours. The spreadsheet is quite easy to use, but no-one on the vessel knows how to write code in Visual Basic, and the spreadsheet has been saved and loaded for numerous years. From time to time the saved file gets corrupted and stops working, so far the only solution that has been found is to load an earlier save and restart from there.

There is also several documents that have been made several years ago with much older versions of the program, and while they still work with updated versions, their formatting gets sometimes weird which makes them unclear.

Shipmanager is a program for fleet management by DNV. The software is modular, and customers may choose the parts of the software they need (*dnv.com, 2022*). The software is used for order management, inventory management and ship safety management.

The main problem is that this program is slow and clumsy to use. After clicking on something, it takes a noticeable time (1-3 seconds) before anything happens, and for example searching for a particular order or items takes a long time and is quite frustrating.

In addition there is a limited amount of licenses for the company fleet, and if too many vessels has the program open at the same time, it is not possible to open it until someone else shuts it down. This has been remedied with time by people remembering to shut the program when they are finished and not leaving it open.

OneOcean by OneOcean Group Ltd offers passage management, documentation, route planning, maritime regulations etc (*oneocean.com, 2022*). On the vessel it is used for updating electronic charts and electronic literature.

The program is straightforward to use, but for some reason when purchasing new charts, it reads the license file and after that reads the backup file and reverts the license to the the situation before the purchase. For this the solution that has been found is to copy the

backup file to a separate folder, and then delete it from the programs folder after which the program applies the new license properly.

Loadcal is a loading program by the Japanese EXA Corporation. It calculates stability and asfdga (*exa-corp.com, 2022*).

The version of the program that in use is quite old, and is not user-friendly. There is a lot of windows and tabs, and different options are scattered here and there and have to be remembered. The only manual we have for it is a few pages on how to print out the documents that are relevant for a draft survey that someone has written years ago.

Also probably because the program version is so old, it crashes quite often on a modern computer. The only solution found solution to this is saving often and restarting the program, sometimes several times, until it works again for a while.

1.2 Definitions

1.2.1 ICT

ICT or Information and Communications Technology was first used as another way of saying IT, Information Technology, but since then the role of Communications has expanded and ICT has come to mean the combination of networked computer systems, the connection networks, data and means of acquiring data (sensors connected to the systems) that use common or compatible protocols for the acquisition, use, transfer and storage of data. (*Murray J. 2011*).

1.2.2 ICT-skills

For this thesis, ICT-skills refers to being able to use computer software and hardware in the capacity required to perform ones work and how familiar the respondent is on using a computer in day-to-day tasks. As this was evaluated only by the respondents answers to the questionnaire, it mainly reflects how well they perform compared to the requirements of their work. In some other field where deeper competence is required, the skills that are sufficient in the maritime sector could be inadequate.

1.2.3 ICT-support

In this thesis, ICT-support refers to persons either ashore or onboard the vessel who are designated and trained to assist with and solve problems that arise with computers. Some software providers have their own support channels, but these were not asked about in the survey and no one mentioned them.

1.2.4 Training, familiarization

Training refers to a more general and theoretical teaching situation while familiarization is more specific and aims show practically how something is performed. Generally training is implemented outside of work and familiarization as a part of it.

1.2.5 Ship, vessel

The terms ship and vessel are used interchangeably in this thesis, and refer to commercial cargo or passenger ships, and not e.g., pleasure craft or military vessels.

1.2.6 ECDIS

Electronic Chart Display and Information System is an electronic chart system that meets the IMO regulations for chart carriage requirements. If the vessel carries type approved ECDISes that meet the criteria, paper charts can be replaced with them (*IMO, 2017*).

2 Implementation

For this thesis an online questionnaire was made with multiple choice and open questions. The questionnaire was sent to ten Finnish shipping companies with a brief explanation about the study, and a request to distribute it to company vessels or sea personnel. The companies were chosen because they had the email of their crewing department available on their web page.

A questionnaire because it is a practical way to reach a large number of people and for this thesis, the general level of competence than the expertise of a few individual people was more relevant. These answers have been analysed in this thesis. The

questions did not require long answers, but there was the option to write quite broadly if the respondent so chose.

28 people answered the questionnaire. The age distributions of the respondents is quite even from 27 to 63 and they work in different positions onboard. The questionnaire was mainly targeted towards officers (deck officers, engineers, masters, chief engineers) but open to anyone who wished to answer.

26 persons answered the Finnish language questionnaire, two answered the one in English.

2.1 Limitations

The thesis deals with ships crews own view of their proficiency. Educational facilities, shipping companies and ICT-support personnel could have different views on the subject matter, and different criteria for evaluating proficiency.

There was also no test to find out how well participants perform compared to their own view, this would have required more commitment from the participants and some way to evaluate or test them. The purpose of this thesis was to find out if crewmembers consider their own level of proficiency adequate for performing their normal daily work.

2.2 Ethics

Ethically this thesis should be unproblematic as no personal information besides the age and occupation was asked and connecting the information received in the survey to a person is impossible. Also the company where the respondent works was not asked, and unless they mentioned programs that no other shipping company uses, connecting the answers to individual companies is not possible, and even then no sensitive company information was asked nor provided in the answers. The questionnaire was also distributed via the shipping companies HR-departments so they had the option to look through the questionnaire before forwarding it to their personnel.

3 Methods

The hypothesis for this study was that ship personnels ICT-proficiency and the available support would be quite varying. While everyone in Finland receives more or less the same education, personal interest or the lack of it results in noticeable differences. In addition different companies have differing resources and preferences in using said resources. The answers to the questionnaire were in line with this.

3.1 Research methods

Quantitative research aims to find causal connections based on a hypothesis. Based on the hypothesis, the researcher aims to find data about the world that can be put into numerical form and by analyzing this data, confirm or refute the hypothesis. Relevant parts of the method are conclusions from earlier research and theories, hypotheses, defining concepts, planning the collection of data and collecting it, choosing the target group, converting the data to a form from which statistical analysis can be made and drawing conclusions based on that (*Hirsjärvi et. al. 2016*).

A quantitative method was chosen to find out the general situation about the subject matter instead of a narrow focus on problems that a few individuals face as this seemed more relevant to me.

3.2 The questionnaire

The questions of the questionnaire are based on the research questions and previous studies with a similar subject of research. The survey was compact and did not include personal details about the respondent so people could answer it without too much trouble or concerns about their privacy. Questions that required answers from which the respondents vessel or employer could be identified were not included.

4 Previous studies

Thesis works and other studies of the maritime sector that were found and were close to the subject matter where mostly about cybersecurity. Some studies from other sectors

found were closer to the subject matter. The observations made in some of these are reviewed below.

4.1 Non-maritime studies

In his thesis written in 2011 "The importance of ICT to organizations" Taneli Virtanen has examined the importance of ICT to the organisation of TYKS Vakka Suomi hospital. A large part of the hospitals systems, and a huge majority of handling patient information is dependant on networked computers, and losing these systems would cause a huge amount of extra work, and some jobs would be impossible to do until the system runs again. While the viewpoint of his thesis is a bit different than the one for this, the interviews to the hospitals personnel includes questions about their relation to ICT.

Some of the interviewees had worked in other fields, and everyone had 10-20 years of experience using computers in their work. Everyone considered ICT an essential tool without which many parts of their jobs could not be done. Common problems were programs crashing and not working after updates, printers and copying machines not working and some lack in their own know-how. If they needed help to solve a problem they had, they contacted either the manufacturers representative who organised maintenance and support, the hospitals ICT-support or asked for help from their co-workers.

Heli Vihonen studied how well managers of food services use ICT in her thesis "Information Technology Skills of the Superiors and Initiating to them in Tays Ruokapalvelut" (2013). In her survey she asked about participants background, education in ICT, ICT-skills and the use of programs specific to the food services. Several participants had earlier studies or careers where they had received more ICT-training, everyone used computers also in their free time outside of work. Some participants in this study mentioned earlier non-maritime studies and their own interest in computers as their primary source of know-how regarding computers, which seems similar to the situation here.

The participants in H. Vihonens study had various levels of competence and various problems with computer use. For some, sending images with email and excel use beyond

saving numbers was challenging, but mostly basic computer use did not cause problems. Mostly the issues had to do with programs that some persons did not use often. Making work schedules was mostly done by a few people and for those who did not use it often, making changes was challenging. One reason for this was that the program was updated frequently and might have changed significantly since the last time it was used. Managing orders, invoices and product registers did not cause problems for the participants as they did it routinely.

The employer offered training in using the required programs, which the participants knew about, and were willing to participate. The training was widely available and participation was good. Overall computers were used a lot, and several chores that had previously been done manually were done with computers. Computer use had also made possible that several persons could do tasks that earlier had been done by one person only.

4.2 Maritime studies

In their masters thesis "Study on cyber security awareness in Finnish ports and shipping companies" (2021) Stella Wallenius and Henri Wallenius touches among other things the human factor of cyber security. While the thesis does not focus on the competence of ships crew in general computer use, there are some parts that are relevant to this thesis.

Representatives of shipping companies were interviewed as part of the thesis, and they evaluated among other things the cyber security awareness of their companies employees. The range of evaluations was low-medium-high, and all of these options were chosen. One point that rose up in the interviews was that there is no updating training available for people who have done their studies in the 80's or 90's, and even the education today might not be completely up to date, as the requirements are based on international standards and agreements and changing them is slow. All the respondents were in agreement that additional training would be required. In general they thought that younger people are more aware of cyber security and associated risks than older ones.

4.3 Conclusions from previous studies

While the theses above have differences to this one, there are similar observations as made in this thesis. ICT is an important tool in a multitude of fields, it's use makes tasks easier and basic use is most often straightforward and doesn't cause problems to employees. However deeper competence is often in the hands of people themselves and their interest in using computers in their freetime. If additional training is offered, people will take part in it.

5 Results

5.1 Participants

Personal information about the participants was not considered very relevant to the thesis and that is reflected in the questions. Personal information that was asked was age and position onboard. The youngest participant was aged 27 and oldest 63. The age distribution was quite even between these ages, ages 30-41 being represented a bit more than others. Also the time spent using a computer per day is quite varied, from 30 minutes daily to eight hours with 4 hours daily being the most common answer (24%). About half of the participants worked as a master or chief engineer, one third as a deck officer, one tenth as an engineer and one deckhand (AB).

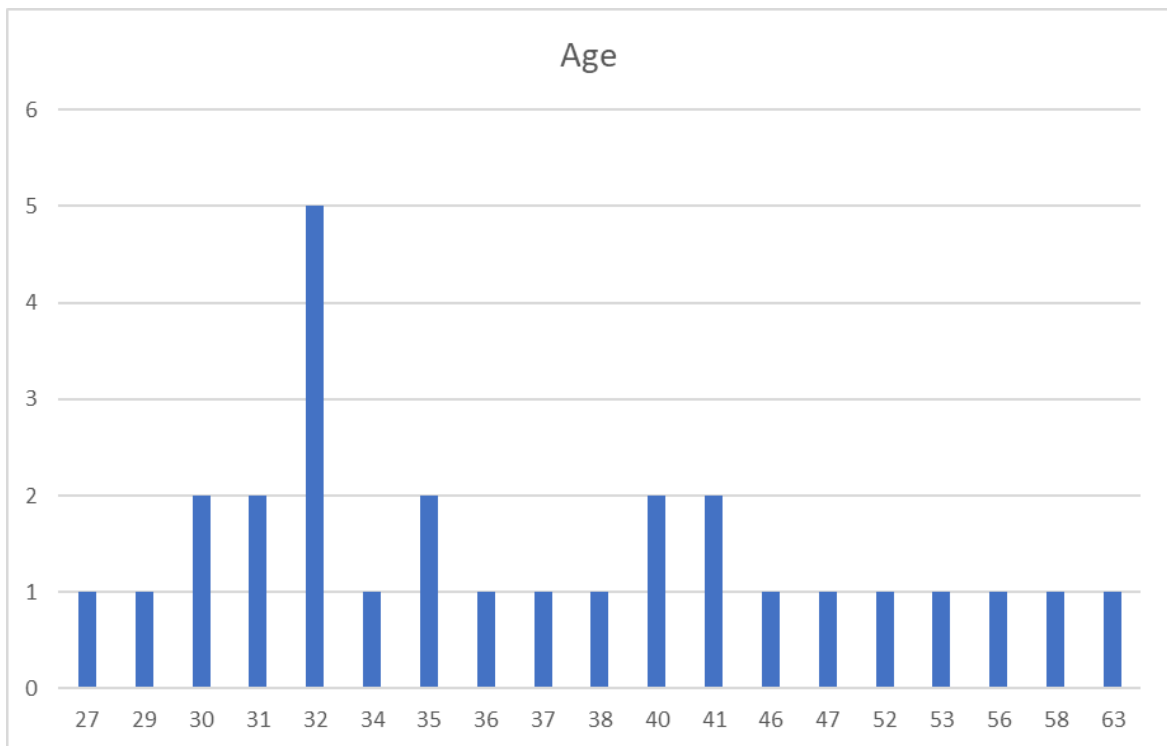


Figure 1 Age of participants.

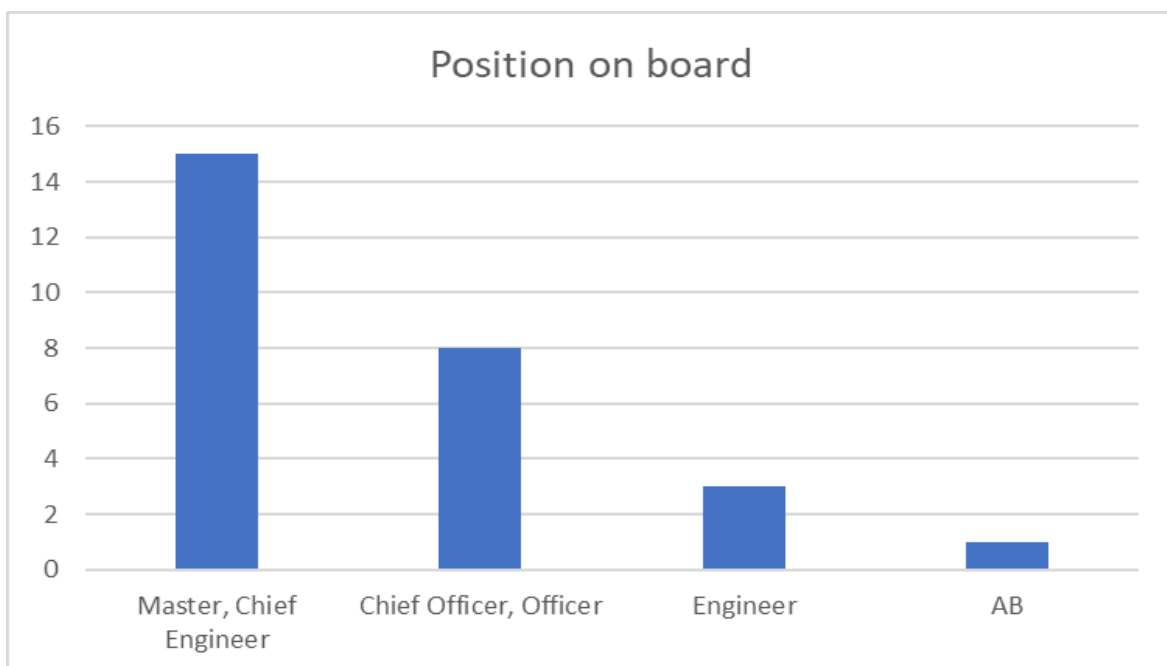


Figure 2 Participants positions onboard their vessels.

These were considered relevant, because typically older people have not had access to computers during their education, and different positions require different amounts and kinds of computer use. In this study there was however no correlation between the age of the participant and their ICT-skills.

A larger portion of respondents working as deck officers or engineers was expected based on that there are more of them onboard a vessel as opposed to one master and chief engineer. This might be because masters and chief engineers usually spend a larger part of their working day using computers, and they may therefore have more interest in answering a survey about it.

Half of the participants thought that they have received enough education for computer use, the other half disagreed with the statement.

The questionnaire was made in English and Finnish. Answers to the English version were underrepresented two to twenty six. Possible reasons might be that the email sent to the shipping company representatives was in Finnish and they might have just forwarded it, lack of interest by non-EU crewmembers or that it was forwarded mostly to vessels with a mostly Finnish crew. One person answered the Finnish language questionnaire in English.

5.2 Programs

The most common programs in use were different Microsoft Office programs. In light of this, it is reasonable that the education concentrates on these and basic computer use. Teaching the use every possible specialized maritime program would most likely not be practical and would require a lot more time and study credits that would have to be taken away from some other aspect of education. With a strong enough basic understanding of computer use, familiarization for ship- or company specific programs should not be an overwhelming task. Another problem would be acquiring all the licenses for the programs.

For the chart below, software software has been combined into categories based on the purpose they are used for to increase clarity instead of naming each program in the chart. Internet browsers and email clients are also excluded. This information is available unedited in the annexed questionnaires.

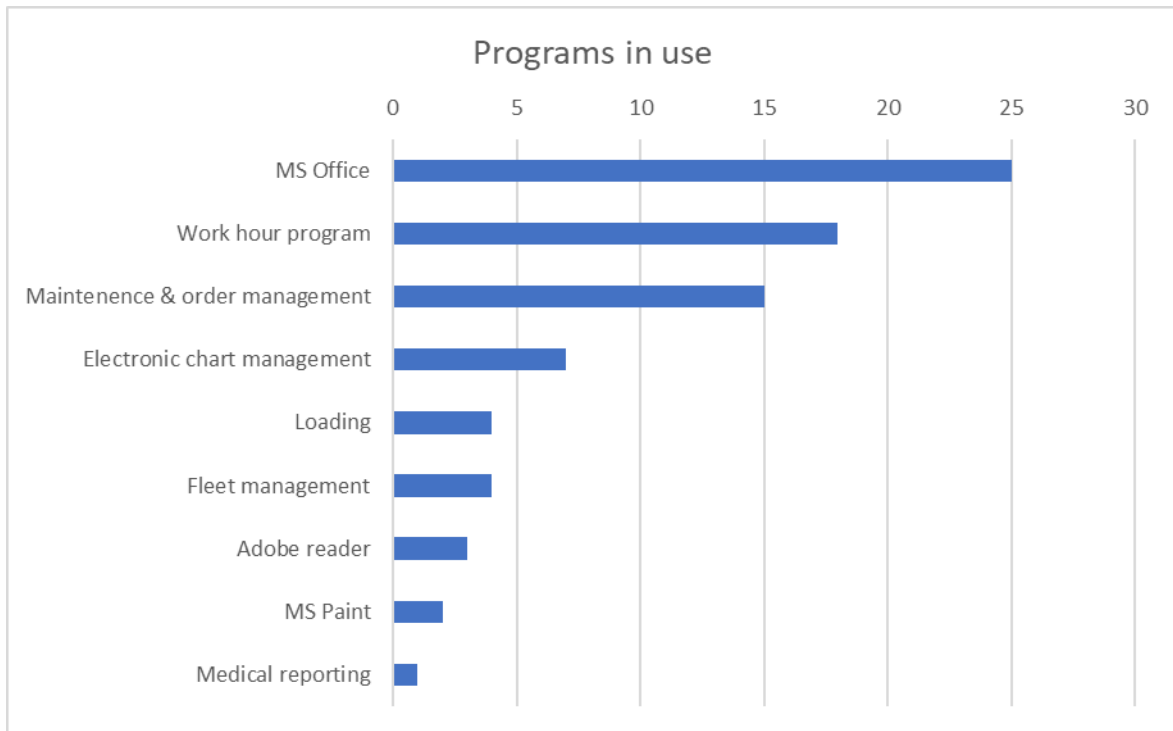


Figure 3 Programs used by participants, different programs used for the same function have been combined into categories.

Some programs that were mentioned in the answers that are in use on the authors vessel are reviewed below for examples.

Loadcal, the loading program in use on the vessel is a bit laborious to use. This might have to do with the age of the program as the version in use is quite old. It is however accurate and gives out precise cargo amounts both when making cargo plans and when monitoring loading or discharging as long as all information is inserted correctly. There is nothing explicitly hard with the program, but there is a large amount of checkboxes and values that are scattered in different tabs or program windows and it is easy to forget some of these in a previous position or value that results in an incorrect result.

When monitoring cargo operations, the user has to enter the vessels drafts and the amount of water in ballast tanks, the program then calculates the cargo amount onboard. Before commencing the amount of fresh water, fuel, lubricants etc as well as sea water density has to be updated to get a meaningful result.

When making a loading or discharging plan, water density, ballast, fuel, lubricants etc has to be updated to correct amounts and tanks. The options for positioning cargo in the program are either evenly per hold or one hold in four sections, these can be chosen on a

per hold basis. This is sometimes tricky as the cargo is usually not loaded completely evenly or in four equal piles. Balancing the cargo requires some knowledge on how different positions affect the trim and hogging/sagging of the vessel.

Oneocean is used on the vessel vessel to purchase and update electronic charts. The program has a quite clear zoomable map where the outlines of chart cells are displayed. Owned charts are shown in green, those about to expire in yellow, and those that have been owned but are now expired are red. Thus it is easy to check quickly if charts for the upcoming route are owned.

Charts are added to the programs shopping cart by clicking on them and when all desired charts are selected, they can be ordered. There is a menu where different scale charts can be selected to be displayed that makes selecting e.g. coastal charts much clearer. Using the program is straightforward, after purchasing the charts a new license is received and the license file, charts and possible updates can be exported to a USB-drive and transferred to the ECDISes.

The program automatically checks for updates to owned charts and informs when these are available, normally new updates are available once a week.

The maintenance and order management program, **Shipmanager** is the one that is the hardest to use as well as the one that the crew most often have trouble with. There is an enormous amount of items and suppliers in the database, and no working search function. Required items have to be searched manually by knowing which supplier has it available or by going through old orders. Confirming that the requested item is the correct one is usually done by comparing the item number to a suppliers catalogue or web page. This is further hampered by the program being slow, it usually takes several seconds for something to happen after clicking on an object.

Maintenances are marked inconsistently in the program, for example some only specify to check a piece of equipment, while in other case individual hydraulic hoses are marked. These can not be edited from the ship. For some maintenance jobs there are remarks on what should be done, for others there are no description.

The slowness of the program is a large part of it's difficulty. As many things are at the end of long menu trees with several branches, unless the user knows exactly how to find what they are looking for, going back and forth takes a long time and is frustrating which easily leads to people not even wanting to learn how to use the program.

5.3 ICT-problems

The overwhelmingly most common problem was that the internet connection was not sufficient for using a program, two thirds had experienced this. One third of the participants did not have any problems at all. Other common issues were a program not functioning, a program being hard to use and programs that could not be used for the task it is meant for. Eight persons mentioned the programs being hard to use or their own level of expertise being insufficient.

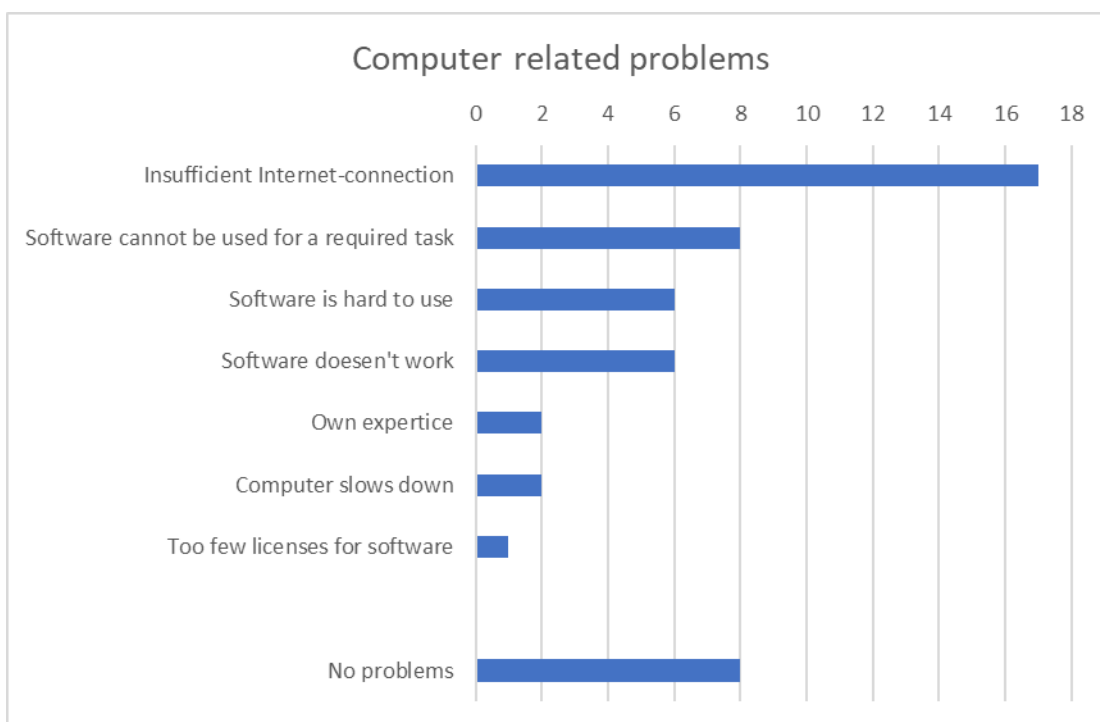


Figure 4 Problems reported by the responders.

5.4 Training outside of school

Twenty four participants answered the question about training outside of their education. Four of these had received some form of ICT-training or familiarization outside of their education. 17 had not received any. Out of these 17, seven had not received any, but

would like to. Two respondents mentioned being self-taught, one had received comprehensive ICT-education during their previous studies. Basic computer use was mostly not a problem.

Those who mentioned that they had received some sort of training considered it useful, and wishes for additional training or at least proper familiarization were common both among those who had received training and those who had not.

A wish for proper familiarization for software that the company uses that are not in common use was mentioned in several answers. It should be obvious that a new system or software cannot be used efficiently without some familiarization, but multiple answers expressed frustration with having to use a new system with no training, or not receiving a proper familiarization when first coming onboard.

5.5 ICT-support

21 participants said they had ICT-support available at the company, and two that they had a designated person onboard the vessel for ICT-support. Four had neither. The quality of the ICT-support available was only mentioned in one answer, in that case it works well. One wished for ICT-support that is proficient with company specific programs, e.g. the loading program.

6 Interpretation

The most common problem that was mentioned was that the vessels Internet-connection was too slow or unreliable. This is not solvable with familiarization or training, but a issue for shipping companies to solve if they consider it a priority.

Issues with the Internet connection were common also among people who otherwise have no problems with computers. Buying and installing software that cannot be used due to connection issues is counterproductive and frustrating. The programs are aquired to carry out some task or function and if that has to wait until the connection is good enough, it is at least delayed, and doing something later might interfere with other tasks or rest hours. For persons whose skills in computer use are lacking, it might also be

unclear why the program is not working and time and energy are wasted when trying to solve the issue.

Eight persons who answered had no problems at all, and eight persons also considered their own expertise or the programs being difficult to use as problems. Each of these represent approximately one third of the persons who answered the questionnaire. In my opinion, both of these issues could be solved or at least remedied with familiarization with the programs in question. While a program being easy or hard to use is somewhat subjective, with insufficient training the difficulty of anything is emphasized. It is natural that some tasks are challenging, but day-to-day work should not be hard. Several answers bring up the wish for better familiarization, and that the respondents could concentrate on using the programs, not solving problems.

Of those who answered the question about additional training or familiarization, half of the participants would like some and the other half would not. This is one third of the total amount of responders, the question was not required to complete the survey. At least when installing new software or systems, there should be adequate training or familiarization to ensure they are used properly and efficiently. A solid basic understanding of computer use would make sure that learning the use of new software would be a smooth process and should not be too expensive to implement.

50% of respondents considered their education in ICT-subjects as inadequate. There was no noticeable correlation between the respondents age and whether they considered their education good enough or not. This and the wishes for additional training indicates that for those who have some proficiency in computer use the amount of education is enough, but people who are not as proficient struggle to some degree.

7 Conclusions

ICT-courses in Universities of Applied Sciences consist of using the Internet, sending email, basic use of the Microsoft Windows operating system and Microsoft Office family of software. These are basic skills and should and students in higher education should have learned this in elementary school or vocational/high school. On the other hand, as they are necessary skills for almost all occupations that higher education qualifies for, it is

justifiable and even necessary to make sure that students learn them at least before graduating. Participants who wrote longer answers expressed wishes for schools to provide stronger education in basic computer use, and that they could concentrate on using the programs for their work and not teaching others or being testers for new and incomplete software. One respondent considers the education in maritime studies to be completely insufficient compared to what he/she received in earlier studies.

A deeper education would be beneficial, but that applies to every subject, and additional resources for ICT-courses has to be taken away from some other subject. One option could be to use three study credits in two courses worth 1,5 credits and covering the basics in one course and strengthening them and going a bit deeper in the second as repeating tasks is beneficial in learning (*Bruner R., 2000*). This way, students would have to remember what they have learned at least once, and their learning would be that much deeper.

Most respondents worked a considerable time daily on a computer. Nine persons spent two hours or less, nineteen for an average of three hours or more. The most common amount of time was four hours. Out of those who spent on average over three hours daily working with computers, eleven replied that they experienced problems. As I did not ask about time spent solving said problems, I cannot say for certain how much time is wasted, but at least in my own experience, issues that interrupt the workflow are frustrating and there is often not very much spare time available for tasks.

Overall, the people who answered the survey do not have insurmountable problems, and half of them consider their education at least adequate. However, the other half thinks that their education in the subject matter has been inadequate, and roughly one third would like additional training. This is a significant portion of people, and their workload could be lessened and efficiency at work improved without a significant cost in time or money. Offering training to employees who are motivated to learn more should be seen as benefitting both the employer and employee, as their work can be made more efficient and less straining. The amount of time that solving computer-related problems takes would have been a useful thing to ask in the questionnaire as now this remains unknown.

7.1 Self-reflection

A clearer focus for the thesis would have made my own work clearer, and the thesis could then have been more focused as well. As it is now, the focus of the thesis splits into three directions, those being proficiency, problems and support, without going in depth into any one of those subjects. For example, focusing on “ICT related problems and the reasons behind them” from the beginning would have made this clearer.

With a sharper focus for the research, the questions of the questionnaire could as well have been made better, and more focused questions would have given clearer data to analyze.

The questionnaire was open from 10.7.2022 to 26.7.2022. Summer holidays might have impacted the amount of answers somewhat, two shipping company recipients sent an auto-reply that they are on holiday, so at some other point in time the questionnaire might have been more widespread. However the programs in use and experiences are different enough that a conclusion can be drawn that it has been answered by people in several different companies.

For some programs I had to search the Internet to find out what they do, this could have been taken into account already when making the survey and added a request to clarify what the programs are used for. However I found descriptions of all the programs mentioned so this was only a small extra inconvenience for me.

The participants wishes for extra training was asked twice, in questions 7 and 9. In question 7 it was only a side note so I mainly concentrated on the answers for question 9 in analysing this wish. This should also have been taken into account when making the survey.

7.2 Reliability

As the responders answers about their own competency are all self-evaluating, they are subject to the Dunning-Kruger effect, which often causes people of low competence to overestimate their abilities because they do not have a grasp on the amount of

knowledge existing on the subject matter (*Dunning D., 247-296, 2011*). As such they cannot be considered completely objective, but as the questionnaire was anonymous and no-one's pride was at stake, I consider the answers trustworthy. There would also be little sense in doing a questionnaire like this otherwise. In addition, as all participants used computers for their work, they have in every case some competence in computer use and a grasp of what can and cannot be done.

The sample size of twenty-eight persons is relatively small, and as the questionnaire did not include any identifying information, I cannot reliably ascertain how well it reached different companies. However, the experiences in the answers are quite varied, and based on the number of different programs used for the same purpose I consider it likely to have reached several different companies. Many responders used programs that I am familiar with, and I consider it likely that persons working for the same company as I do have been more likely to answer than people who have no connection to me at all.

These things considered, and as the results seem sensible to me, I regard the answers reliable enough to give a useful picture of the competence and needs of seafarers in ICT-matters.

7.3 Possible future research

Future research could provide a deeper understanding on several things this thesis touches on. The level of proficiency in computer use requires when working onboard and how well those requirements are met could be elaborated on.

As this thesis focuses only on ships crew's viewpoint on their own expertise, the opinion of employers, ICT-support personnel and educational facilities would complement this and offer more insight into the situation.

The subject of ICT-support on vessels was touched upon. Not all vessels or companies had any, some had a designated person onboard, and most had ICT-support personnel ashore. The kind of support that the sea personnel needs, if any, and how well these needs are met by support that is available could be done.

Finally, a more specific study on the ICT-proficiency of ships crew's and whether there are any clear shortcomings in some areas could be conducted. If any such shortcomings would be found, finding remedies to them would then be possible.

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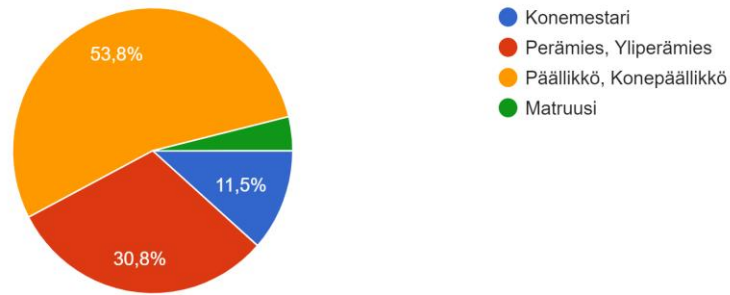
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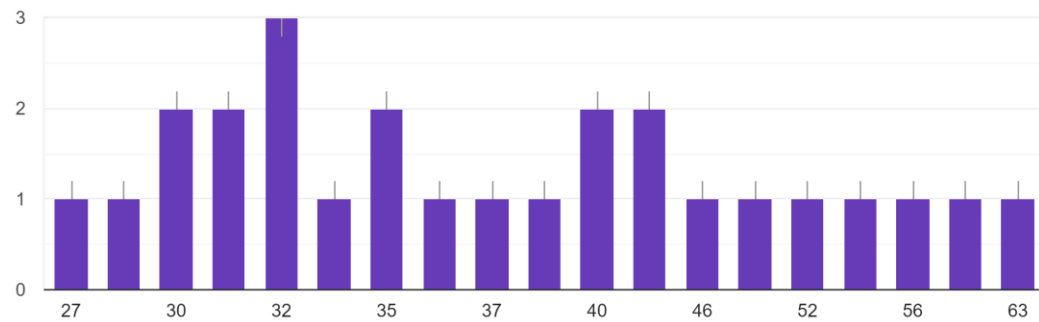
Virka aluksella

26 vastausta



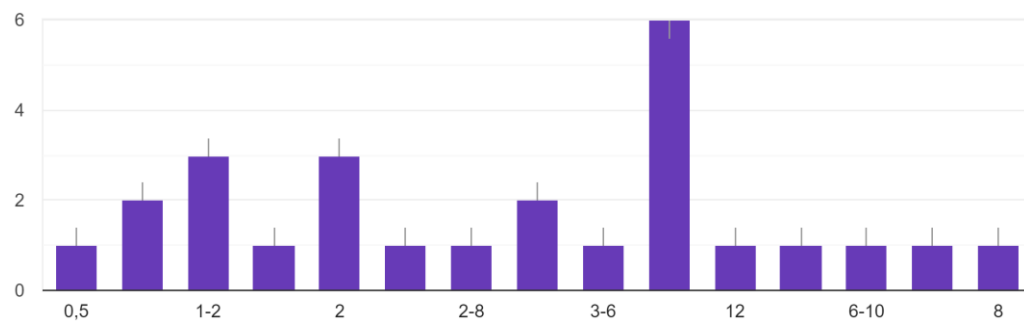
Ikä

26 vastausta



Kuinka monta tuntia päivässä työskentelet tietokoneella?

26 vastausta



Mitä tietokoneohjelmia käytät työssäsi?

25 vastausta

-Seamanager, Mxsuite,exel

-Office ohjelmat, varustamon huolto-/tilausohjelma

-Office ohjelmat ja Adobe, ECDIS Sperry Marine Vision Master FT, One Ocean, Sea Manager, Ship Manager,

-Excell, ship manager, word, sea manager, etc...

-Word, excel, Seamanager, Shipmanager

-exel, word,

-Lastiohjelma, excel, word, sähköposti, shipmanager, seamanager

-Excel, Word, OneOcean

-Excel, word, internet selain, outlook, huolto- ja lastiohjelma, työtuntiohjelma

-Seamanager, Shipmanager, Adobe, Office, selaimet

-Sea Manager, Ship Manager, Outlook, Excel, Word, Paint

-Ship Manager, Excel, Word, Seamanager

-Ship manager

-shipmanager,seamanager, excel,chrome

-Office

-Microsoft Office, SeaManager, ChartCo OneOcean, LoadCal

-Seamanager, MXSuite, Word, Excel, Outlook.

-shipmanager, seamanager, word, excel ja muut töihin liittyvät.

-word, excel, seamanager, shipmanager, one ocean

-Excel, word, outlook, shipmanager, seamanager, waterproof

-Excel, Word, Ship Manager, Sea Manager, Outlook, Firefox, Paint, Adobe acrobat PDF reader

-Excel, Word, Outlook, Marad, Locopias

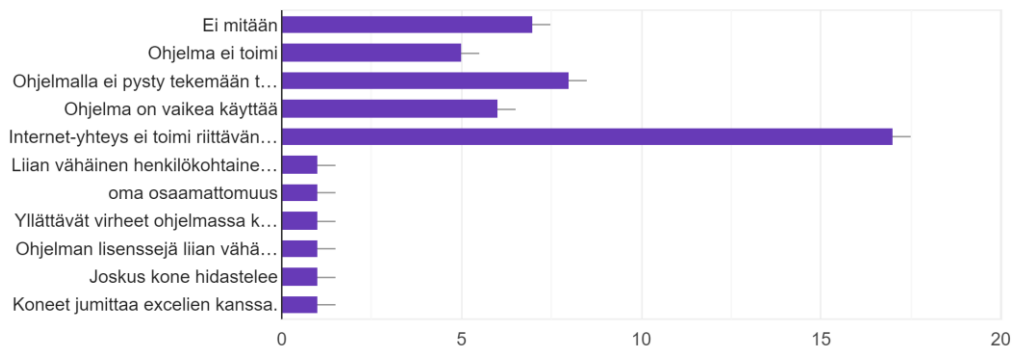
-Finnfox

-Transas,Exel,Word,Zeroni,Merp,Outlook,Gmail

-Excel, Word, ShipManager, SeaManager

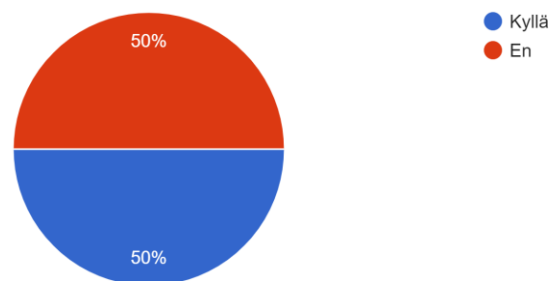
Mitä ongelmia sinulla on tietokoneiden ja ohjelmien käytössä?

26 vastausta



Koetko saaneesi koulussa riittävästi opetusta tietokoneiden käyttöön?

26 vastausta



Oletko saanut koulutusta tai perehdytystä koulun ulkopuolella? Jos kyllä, oliko se hyödyllistä. Jos ei, tahtoisitko sellaista?

22 vastausta

-En

-Kyllä

-Kerran. Tahtoisin lisää ja se olisi tarpeellistakin. Mieluummin omalla äidinkielellä -jos mahdollista.

-itseoppinut

-En ole, en tarvitse.

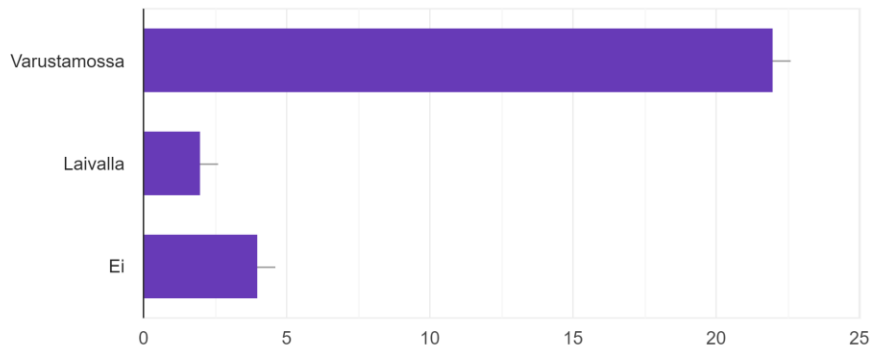
-en ole .

-Yhtiökohtaisiin erikoisohjelmiin en ole saanut koskaan minkäänlaista virallista koulutusta. Vain "no joku näyttää" tason koulutusta.

- En, haluaisin, varustamon pitäisi järjestää varustamokohtaisille ohjelmille oman koulutuksen
- En ole saanut koulun ulkopuolista. Jatkokurssi kelpaisi aina.
- Ei tarvetta tällä hetkellä
- Kyllä, esim työtovererilta ja ystäviltäni.
- yes
- ei
- Oma-aloitteista puuhastelua tietokoneiden kanssa
- En, enkä koe tarvitsevani.
- Ennen merenkulun opintoja, opiskelin autosähköinsinöörilinjalla(Automotive electoric engineering). Siellä perehdyttiin monta kuukautta syvällisesti ja intensiivisesti kaikkiin Microsoft Office työkaluihin sekä ohjelmointiin. Huomattavasti laadukkaampaa ja syvällisempää koulutusta, kuin missään merenkulun oppilaitoksessa Suomessa. Merenkulun oppilaitoksissa on tarjolla vain pintaraapaisu Word ja Excel työkaluihin. Käytännössä opetetaan vain absoluuttinen minimi, jotta näitä pystyy edes jotenkin käyttämään, ja sekin itseopiskeluna. Huomaan, kun töihin tulee uusia perämiehiä jotka ei osaa käyttää tietokoneita yhtään ja se vie paljon aikaa omasta työajasta, kun pitää opettaa rautalangasta vääntäen yksinkertaisimpiakin asioita.
- Olisihan se ihan hyvä, tai siis olisi ollut jos sitä olisi ollut ajoissa.
- En ole saanut koulutusta koulun ulkopuolella. Ohjelmien peruskäyttö onnistuu ihan ok.
- Kyllä, laivan päällä saatu perehdytys oli hyödyllisempää kuin koulussa saatu opetus.
- En ole. Huolto-ohjelmaan (Marad) olisi aikanaan saanut työnantajan puolesta olla perehdytys kun se tuli käyttöön eikä kukaan ymmärtänyt siitä mitään.
- Enpä juurikaan. Toivoisin työnantajalta kattavamman perehdytyksen uusien ohjelmien käyttöön.

Onko varustamossa tai laivalla jossa työskentelet ICT-tukihenkilö tai vastaava jolta kysyä apua ongelmatilanteissa?

26 vastausta



Kaipaatko työhösi enemmän tukea, koulutusta, ohjeita tai jotain muuta vastaavaa tietoteknisiin asioihin liittyen?

22 vastausta

-Kyllä

-En

-Varustamoiden ohjeistus on usein puutteellista tai sitä ei ole, esim. tietoturvaan liittyen. Varustamokohtaisten ohjelmien kuten henkilöstö-, tilaus- ja huolto-ohjelmat perehdytys tietyissä tilanteissa voisi olla parempaa. Ei tarvitse olla raskas kurssipäivä tai vastaava, vaan esimerkiksi varustamon omiin ohjelmistoihin ja toimintamalleihin perehdyttävä yksinkertainen ohjeistus.

-Kyllä.

-en

-Firman IT-tuki toimii hyvin.

-kyllä

-Kyllä. Koulutusta ja ohjeita. Myöskin IT tuki joka osaa varustamokohtaiset ohjelmat esim lastiohjelman.

-Uudet ohjelmistot ja LAITTEET tulisi kurssittaa ihmisille, nykyinen "se on siellä alkakaa käyttämään"- malli ei toimi. Se lisää työpahoinvointia, tuo stressiä muutenkin hektiseen työhön ja hankaloittaa laivan perustoimintoja. Kukaan ei useinkaan tiedä kuinka ohjelmia/laitteita tulisi käyttää saatika miten niiden kuuluisi toimia, niiden toimivuus tulisi

testata muualla kuin loppukäyttäjällä, loppukäyttäjä on muutenkin aivan ylityöllistetty ilman mitään rottakokeita.

-En tällä hetkellä

-Tämänhetkinen tieto ja osaaminen on mielestäni riittävää, mutta aina olisi hienoa oppia lisää.

-Yes

-en juuri

-En oikeastaan

-Kaipaen enemmän koulutusta oppilaitoksilta perustyökaluihin. Ei se oli varustamon tehtävä opettaa näitä asioita. Jos varustamolla on omia tietkoneohjelima joita käytetään, perehdytys/käyttöohjekirja on aina ollut saatavilla, niissä varustamoissa, joissa olen itse ollut töissä.

-Toivoisin, että voisin pysyä ohjelmien käyttäjänä. En tietoteknisten ongelmien ratkaisijana.

-En kaipaa

-En tällä hetkellä.

Position onboard

2 vastausta



Age

2 vastausta



Approximately how many hours daily do you use a computer for work?

2 vastausta

-2

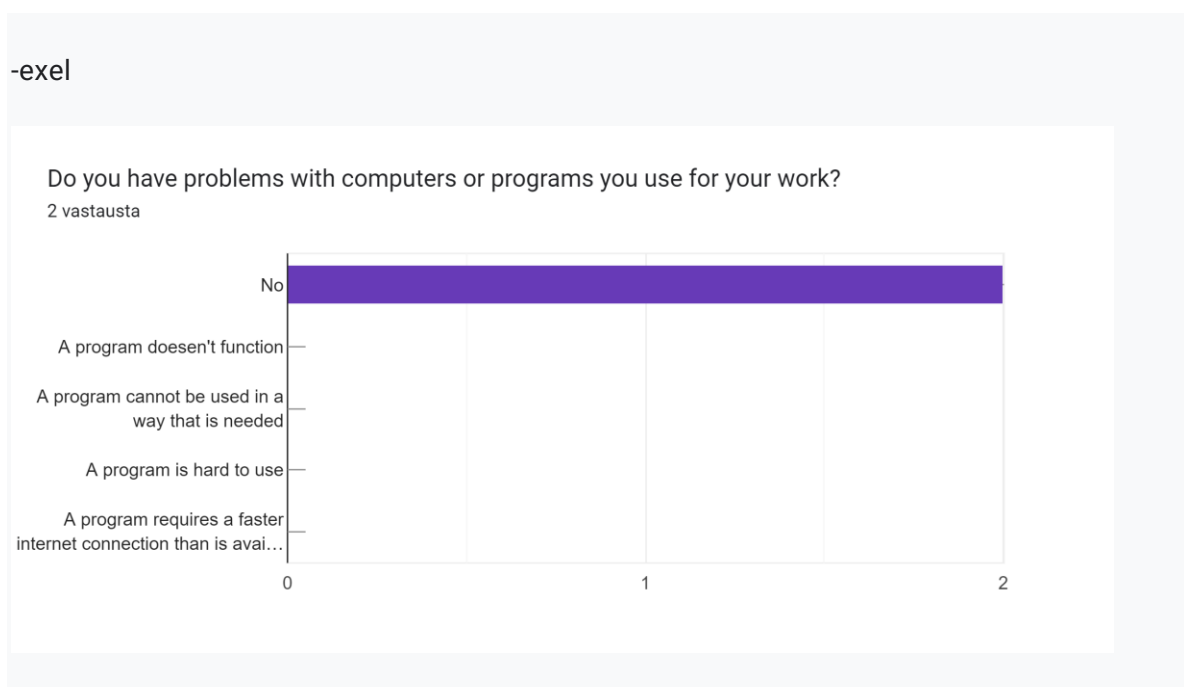
-8

What programs do you use for your work?

2 vastausta

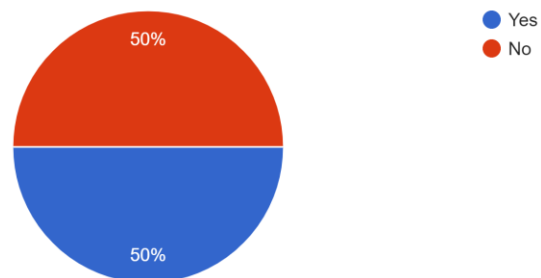
-Microsoft office, Marad, Navtracker, ADP

-exel



Do you think you have received enough education in ICT-related subjects

2 vastausta

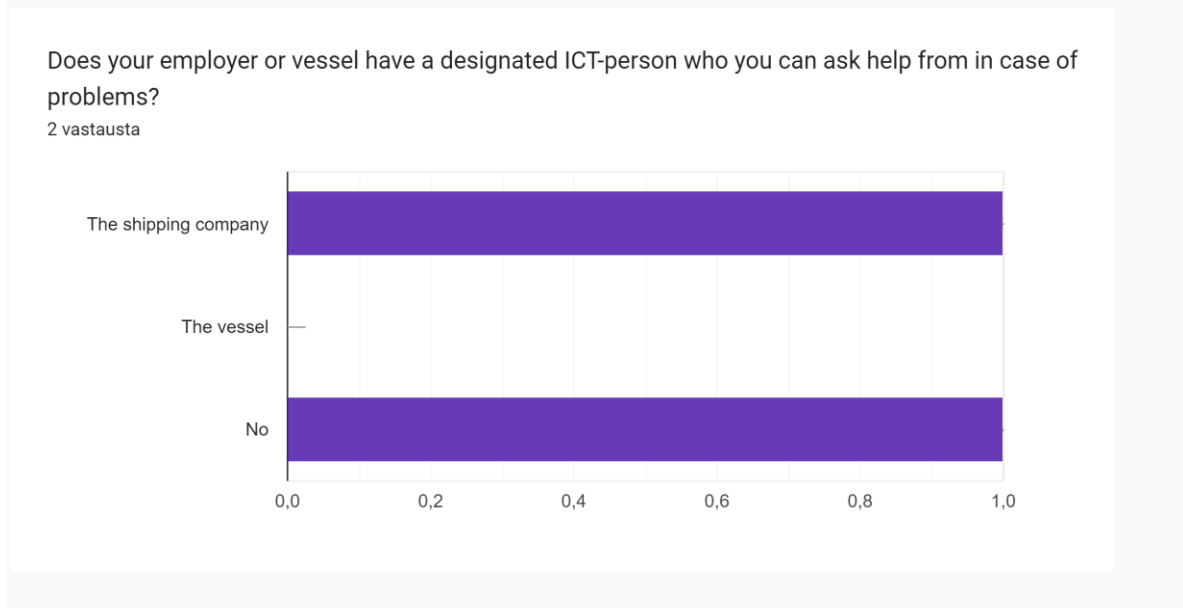


After graduating, have you received ICT-training or familiarization? Was it useful? If you have not received any, would you like to?

2 vastausta

-no

-no



Would you want more more support, training, instructions or something else regarding computer use for your work?

2 vastausta

-no

-no