Enquiry into Cooperation Between Master's IT Programme and Companies

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Introduction

The need and demand for adult education are constantly growing. To answer this need, it is important to integrate study and work life and develop flexible ways to study. The starting points for the development must include the viewpoints of adult students, the education organizer, and the industry. Taking into account these viewpoints requires, first and foremost, that the needs and hopes of the parties are mapped out and close interaction between the parties is set in motion.

Adult students typically work and have families, which means that for them flexibility in studies plays an important part. Variations in stress and strain caused by the combination of work, family and study and the consequent lack of time are factors that slow down studies. The education organizer must pay attention to these changing levels of student workload in study planning and implementation by enabling flexible study. Where the employer's attitude towards employees' study is positive, the employer often has the possibility to be flexible with working hours and also otherwise support the employees' study. Thus, it is important both for students as well as for the education organizer that the employer sees education as supporting the company's objectives.

For a long while now, in connection with the master's degree in information technology at Kokkola University Consortium, an adult education model that is based on work life has been under development and a network with local employers has been created. Engineering and master's education in information technology, starting at the turn of the millennium, was specially aimed to support the growth of ICT companies in the area. During the growth period, there was a constant need for competent workforce, which the higher educational institutes tried to satisfy. The master's education was oriented to deepen the expertise of those already working in companies; thus, the students either had a bachelor's degree or equivalent studies completed. The orientation options and priority areas of the education were planned, keeping in mind the companies' expertise needs. Also, the educational arrangements were planned in such a way that working students had a chance to participate in education [1]. As a result of cooperation between companies, higher educational institutes and other public bodies, at the beginning of the millennium more than 500 new ICT jobs had been created, in a very short time, around the local area.

In earlier research related to cooperation between work life and education, the focus has often been on whether the education meets the needs of companies [2] [3]. Also, one of the particular aims of this study was to examine the needs of local companies for the master's education programme. The approach in the master's degree education in information technology is, nevertheless, different when compared with many other educational approaches. This is due to the educational background and work life of adult students. In addition, the aim was to find out about companies' willingness and possibilities to support their employees' study and integration of study and work.

To map out and improve the possibilities for cooperation between education and work life, the Verkotut-project was launched at Kokkola University Consortium. One of the project's components is integration of IT education and work life. This article briefly describes the objectives of the project. The article focuses on a company survey and on its preliminary results, which deal with the part of the project where the focus was on the integration of education and work life. The survey mapped out the significance of training and different competence areas to companies, and matters related to the integration of work and study. Finally, conclusions arrived at and guidelines for future work are presented.

Project description

In 2008, the Verkotut-project was launched in Kokkola. The project is funded by the European Regional Development Fund and coordinated by the Kokkola University Consortium Chydenius. The point of departure

for the project was the knowledge that a more and more significant part of the education in the area would focus on adult education in the near future. This would especially call for education models that support work life and that would themselves have to be supported with solutions based on the use of information networks. Individual organizations do not usually have the economic resources to maintain a support organization that would cover the necessary technical and pedagogical aspects and the related research and development work. Therefore, the central aim of the Verkotut project is to create the conditions required for the operation of a networked educational centre and develop practices that allow flexible study alongside work. Activities of the Verkotut project can be divided into several independent parts.

In the part that is related to the integration of teaching of information technology and work life, questionnaires and interviews are used to chart out the thoughts of employers and students about education needs, about how to combine work and study, and about teaching arrangements. At the same time, the role of companies in supporting their employees' studies and as beneficiaries from the education is examined. At a later stage of the project, based on the information obtained from the surveys, the focus is moved to planning of practices which would pay more attention to the needs of and opportunities in work life. This article focuses on the examination of the results of the company survey and interviews.

Results of the company survey

During 2009, a survey related to education was conducted among the biggest ICT companies in the neighborhood of Kokkola University Consortium. The survey was realized by sending an electronic questionnaire to the executives of the companies or local company branches. Each of those who answered the questionnaire was also interviewed individually based on the questionnaire. All 12 companies to whom the questionnaire was sent participated in the survey and in the interviews.

The businesses which participated in the survey included local SME companies (3) and companies with a national reach (6), as well as companies operating globally (3). Many of the companies responding to the survey were involved in operations in more than one business area. For five of the companies the main business was telecommunications, ten companies dealt with software, and the business area of five companies was related to hardware. Another popular business was support services and consulting. One of the companies focused particularly on transmission services. The main markets for the interviewed companies were evenly made up of large and small companies and of public organizations.

The survey mapped out the significance of employee training to companies, the importance of employees' general skills and substance competence areas from the companies' perspective, and matters related to the integration of work and study.

The importance of employees' educational level to companies

With the help of a 4-step scale included in the questionnaire the employers were asked, among other things, about the importance of tertiary level education for their company. All respondents thought that finding education in the local area that would lead to a bachelor's level engineering degree in information technology was *important* or *very important*. Finding education in the local area leading to a university degree in information technology was regarded almost equally important. Although the companies regard students with a university degree as better prepared than those from polytechnics, the companies in the area have more work that is typically done by engineers.

The importance of education for the company was also examined by asking the respondents to choose the two most important employee characteristics in a recruitment situation. The respondents' emphasis was clearly on work experience and the contents of the courses. The responses are shown, in more detail, in Table 1. On the other hand employees' educational level was seen as important for the company's image and, likewise, the importance of an academic degree from the viewpoint of work tasks and career progress was acknowledged.

Table 1. The most important employee characteristics in a recruitment situation

Employee's characteristics in a recruitment situation	The most important	The two most important
Work experience	3	7
Contents of the courses completed	2	6
Other	2	2
Degrees completed	1	2
The applicant's verbal information about his/her competence	1	2
Commitment to the local area	1	1
Total	10	20

General competencies

From the perspective of the employer, it is often significant that the employee, in addition to substance competence, has general competence related to his/her job description. With this survey, the idea was also to map out the kind of general competence needed in companies. The representatives of the companies were asked to assess the importance of general competencies mentioned using a 4-step scale. The question was responded to by 11 company representatives. The respondents found it as *very important* to have an ability to acquire new knowledge, define and solve problems, as well as have team work skills. Almost as much support was found for social skills, project management skills and proficiency in English language. Regarded clearly as the least important were proficiency in Swedish (the second national language of Finland) or in some other foreign language.

The respondents were also asked to select the three most important skills. The responses thus examined were quite similar. However, the ability to work independently and skills required by the teamwork became clearly

elevated in importance. The responses are shown, in more detail, in Table 2.

Table 2. Employee's most important general competencies

Employee's most important general competencies	The most important	The two most important	The three most important
Ability to work independently	4	5	5
Team work skills	3	6	7
Social skills	3	4	5
Project management skills	1	2	3
Ability to acquire new knowledge	1	2	3
Ability to analyze, define and solve problems		3	9
Other than information technology competence that is related to the application area		2	2
Swedish language proficiency			1
Interaction and argumentation skills			1
Total	12	24	36

The respondents were also asked about their impression about the preparedness of persons having a university degree in these general skills. This question was responded to by representatives from ten companies. Of them, seven estimated that most of the abilities in this group were *good* or *excellent*. Two thought that most of the abilities were *not very good* or *poor*. The answers of one of them were equally distributed. For the most part, the abilities were regarded as being on a good level as far as the general skills found important (shown in Table 2) were concerned. Based on the survey, the strongest skills attributed to those with a university degree are the ability to acquire new knowledge and the ability to analyze, define and solve problems. Also the ability to work independently, proficiency in English language and the ability to write technical reports were estimated to be on a good level. On the other hand, it was thought that there would be room for improvement in sales and marketing skills and in language skills, except in English.

Substance competence

To map out substance competencies wanted by the companies, the respondents were asked to estimate, using a 4-step scale, how important they saw the given 35 areas of substance competence from the viewpoint of their companies, now and in the near future. The purpose of this question was to get information about whether the education provided met the needs of the corporate world or whether some component important for them was missing from the education. The competence areas that were given prominence in the replies were the following:

- knowledge of software design and development concepts, methods and tools
- knowledge of wireless technologies and networking components, topologies and communication protocols
- knowledge of system specification and design methods

On the other hand, general theoretical competence areas such as design and analysis of algorithms, the basics of information processing theory and good basic

knowledge of mathematics were regarded also as very important.

The respondents were asked to select the five most important skills from the company's viewpoint from among the substance competence areas. When the inquiry was formulated in this way, the substance competence areas were found to have a closer correspondence with the companies' core competence areas. Of the 35 substance competence alternatives offered, 29 were selected as belonging among the five most important competencies. None of the substance competence areas were found among the five most important more than four times. Based on the results, it can be said that the companies' needs in relation to substance competencies are quite different, which gives support to the provision of broadly-based education.

Integration of work and study

The part of the survey focusing on the integration of work and study charted out the importance of topic-related issues from the perspective of the respondent's own area of responsibility. Generally speaking, there was a lot of willingness to share and acquire knowledge about the possibilities of integration. All of the respondents except one regarded it as *important* or *very important* that work tasks could be utilized as a part of study. It was also found *important* to get timely information about the contents of education and employees' study progress and to get some ideas about study support practices in other companies. Distribution of this kind of information requires even closer communication than before between the education organizer and the companies. In fact, most of the respondents regarded it as *important* or *very important* to establish a cooperation panel to deal with education and integration of study in the area. The responses are shown, in more detail, in Table 3.

Table 3. The most important issues related to the integration of work and study

Issues that are important in the integration of work and study	The most important	The two most important
Work tasks can be utilized as a part of study	7	8
Timely information about the contents of education	2	6
Timely information about the student's progress	1	1
Tips about study support practices in other companies		2
Establishment of a cooperation panel for the employers in the area		2
Arranging teaching in English		1
Total	10	20

To the enquiry about the possibilities of the company's employees to study while at work, all the respondents replied that whenever necessary the employee had the opportunity to organize his/her work tasks in such a way as to enable study. It was known that some of the companies had practices related to rewarding systems or follow-up in respect of their own employees' study. The responses to an open question dealing with the matter

revealed that individual companies supported study, for example, by paying course fees, by taking study success into account in wage negotiations, by rewarding employees who had completed a degree and by providing off-duty time for the completion of a thesis. In one of the companies, guidelines about the principles of study while at work had also been produced. Nevertheless, half of the companies who responded had no reward or follow-up systems.

Conclusions and Future Work

Integration of study and work life is of foremost importance in meeting the challenges brought about by adult education. This requires, above all, close communication between the students, the education organizer and the companies. The aim of the Verkotut project launched at the Kokkola University Consortium is to make the interaction closer among employers as well as between employers and the education provider. According to the survey realized at the beginning of the project, there is willingness among the companies for interaction that is more solid than at present. This augurs well for the continuation of the project. Cooperation between employers, students and education organizers will be strengthened by, for example, forming a cooperation panel which will meet once or twice a year and where the local employers in the ICT area have a strong representation.

The survey reveals that the need for substance competencies varies a lot between different companies, and provision of broadly-based education is well justified. The company survey undertaken gave a good idea to the education organizers about what kinds of substance competencies are needed in the companies and indicated that the profiling of education and educational offer more or less meet the current needs of the companies. Awareness of the desired general skills makes it possible to pay attention to them, for example, in the implementation of a course. When the profiling and orientation alternatives in education are well aligned with companies' needs, there is a better chance to take the companies' wishes into account during education planning. The most important general skills and substance competencies brought up in connection with this survey were very similar to those surveyed in [3]. Additionally, proficiency in English became highlighted in our research.

At present, it is feasible to integrate work life and study in some of the study units (e.g., work practice, projects, seminars, final project) connected with the master's studies in information technology Awareness about these studies is, however, weak among the employers; thus, combining these studies with work has remained the responsibility of the student mainly. It is, therefore, necessary to increase the employer's awareness about these studies, to allow them to be perceived as a whole that benefits the employer.

According to the survey, employers have different practices to follow and support the study of their employees. For example, the employers who participated in the survey are often willing to enable study also during work time and some of them are also prepared to reward progress in studies. All sides would benefit if the existing practices were spread among the companies. With increasing interaction, it is expected that the practices found good will spread from one employer to another.

References

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Cooperation between and with companies is emphasized when education is arranged for adults who study alongside their work. To bring the needs of companies into attention, a Verkotut project was launched. Its purpose is to improve the integration of education in information technology and work life. One of the central activities in the project was a company survey, the results of which will orientate the work of the project later on. The survey mapped out the importance of employees' educational level and of employees' general skills and substance competence areas to companies, as well as matters related to the integration of work and study. This article focuses on the examination of the results of the company survey. Bibl. 3, tabl. 3 (in English; abstracts in English, Russian and Lithuanian).

И. Хакала, С. Лайне, М. Мюлюмаки. Исследование связи разных предприятий при организации учебного процесса взрослых // Электроника и электротехника. – Каунас: Технология, 2010. – № 6(102). – С. 143–146.

На основе обширного опроса сотрудников предприятий сформулрованы требования и созданы методы обучения взрослых работников разных организаций. Особое внимание уделено изучению информационных технологий, на основе которых разработан проект „Verkotut". Библ. 3, табл. 3 (на английском языке; рефераты на английском, русском и литовском яз.).

I. Hakala, S. Laine, M. Myllymäki. IT magistro laipsnio studijų programos ir įmonių sąsajos tyrimas // Elektronika ir elektrotechnika. – Kaunas: Technologija, 2010. – Nr. 6(102). – P. 143–146.

Bendradarbiaujant įmonėms tarpusavyje ir su mokslo įstaigomis, atkreiptas dėmesys į dirbančių suaugusiųjų žmonių studijas. Aprašomas projektas „Verkotut", kurio pagrindinis tikslas yra padidinti mokymo reikšmę ne tik informacinių technologijų studijų programoje, bet ir darbe. Įmonių apklausa parodė darbuotojų išsilavinimo lygio, bendrų įgūdžių ir pagrindinių kompetencijų svarbą įmonėms. Bibl. 3, lent. 3 (anglų kalba; santraukos anglų, rusų ir lietuvių k.).