Over 283 693 Reasons to Elaborate Education, Work and Apply E-learning

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Abstract

Data from the national databases about the population and education shows that about 283 693 under 5-year old children stepped into the Finnish educational system in 2004. Their future learning, a lifelong interaction amid developing and decision-making people, is supported with the education that promotes understanding the decisions and knowledge related to them. In Europe, the demand for a high educated labour force and the need for elaborating e-learning are emerging. E-learning enhances crossing of distances like space and time between educational content and the learners. By making advanced learning opportunities accessible to potential and motivated learners over cultural and spatial boundaries, e-learning can aid in distributing economic growth. However, we argue that economic factors should not be superior reasons when justifying the further utilizations of e-learning for our children.

Keywords: education, educational technology, learning, e-learning, e-learning business.

Introduction

It is well known that interaction with others and our environment underpins learning and development (Price & Rogers, 2004, p. 137). Informing and discussing with students, colleagues, customers and friends is a way of achieving mutual goals. Learning technology can support this knowledge sharing by giving various access to meaningful information e.g. with the help of digital learning environments (Scardamalia & Bereiter, 1993). In literature, this diverse concept of digital learning environment is referred to as electronic learning (e-learning) environment, e-learning systems, computer-based learning environment (Häkkinen, 2002), web-based learning environment (Khan, 2001), learning management systems (Lewis et al, 2005) virtual learning environment, etc., depending on the context where mentioned and in what way e-learning is understood (Tsai & Machado, 2003). E-learning environments development in Finland is done mostly in companies, outsourced from education institutions to the companies or done in research cooperation with companies. In 2003, EU area's world market share concerning e-learning was estimated to be 30% (€ 10 billion) whereas the US market share exceeds 50% (Massy, 2005). Lith (2005) estimated Finnish companies' total turnover as € 139 million. One question to be solved is which one is the primary point of view for Finland: the competitive ability of EU's e-learning cluster or the success of national e-learning cluster (Matikainen, 2005).

In this paper, we argue that there is another prime reason to elaborate e-learning than economic growth. The customers are the prime reason for eco-

nomic decisions. By analyzing reports about e-learning business, data about e-learning doers and educational system, we conclude that transparent and mutual goals could support co-operation and the value of educational technology for the customers in business and in the public sector.

Learning and Working Customers

The following statistical data is obtained from the Nation Statistics institution, the National Board of Education and Ministry of Education databases concerning the year 2004. It suggests that major parts of the e-learning business customers working and/or are involved in education system.

The Finland's population was about 5.2 million at the end of December 2004 and it is estimated that the population is not increasing in Finland. The most likely this means that there are going to be smaller labour force and fewer children in the future. Children in Finland start their school at the age of 6 or 7. There were 283 693 (5%) under 5-years old and 1 613 189 (31%) 5-29 year old citizens in 2004. Among them (Table 1.) 55 089 children were at preschool education, 581 962 children at comprehensive school, 119 142 students at college, 134 852 students at secondary modern and 35 175 apprentices with apprenticeship contracts with companies or organizations. In higher education establishments, the amount of students was estimated to 174 324 students at 20 universities and 32 962 students at 29 polytechnics. This makes total of 1 133 506 individuals in Finland's educational system.

In 2004, there were about 2 365 000 employed and the total labour force (15-74 years) was about 2 594 000 people. Among all the people, 17.5% was under 15 years and 15.9% (830 940) were over 65-years old. The Ministry of Labour has estimated that the labour force will decrease from 2003 onwards. The number of young entrants to the labour market will be smaller than the amount of leaving. Also McCullough (2005) denotes that by 2010 in Europe, it is estimated that half of all additional new jobs on the labour market will require tertiary education and almost 40% upper secondary level education. This shortage of skilful labour may set a ceiling on Finland's economic growth, and the upshot may be that no jobs are created or jobs are created only abroad. The Ministry of Labour aims to improve the efficacy and performance of the education system by goals e.g. all members of youth age groups receive post-compulsory and post-secondary vocational/professional education, the knowledge and skills of the adult labour force are up-graded, adult education and training services are increased and the recruitment of immigrants is intensified. Education and the learning environments will need to be developed with more attention paid to versatile and comprehensive studies. This means also that know-how in educational technology must be raised to a high international level by means of pedagogic knowledge accrued in virtual teaching, in other development projects and in research. What are needed are regional, multi-professional cooperation networks between education, research and business.

E-learning Business

At the end of the 20th century, the hype in e-learning business upraised the opportunities for marketing something new and revolutionary constituting e-learning as quite attractive for organizations. However, after the hype, organizations integrated, finished or outsourced e-learning units in order to gain savings and when e-learning was not increasing revenue as expected (e.g. Massy, 2005 p. 28). The e-learning business is extremely fragmented industry cluster, large number of different stakeholders and developing industry overall. In the national reports (Mikkelä, Sibelius, & Kivimäki, 2004; Mikkelä, Sibelius, Kivimäki, & Bergman, 2005), 150-200 e-learning business companies were listed in three categories: 1.Content providers, 2.Services, and 3.Technologies, Tools, Shareware, and Hardware Providers. During our research, we found overlapping because of corporate acquisition and bankrupts after the publication of the original list. About half of all companies had 1-4 employees and 80% had less than 20 employees. We found nine companies that had over 100 employees, but those operated in various business areas and broadly interna-

tionally. We concluded, based also on the information given by the Register of Companies, that a typical Finnish e-learning company has 1-20 employees and most of them have been operating over ten years in the market, starting their operations after 1995. Later in 2005, our estimation was verified by Muukkonen (2005): there are small-size companies with some workers and a dozen of big companies. There are about 200 companies offering e-learning in Finland and the total revenue of e-learning business is € 30-40 million/year in 2005 (0.2 – 0.3 % of world market revenue of € 14.6 billion, International Data Group, 2005). However, Matikainen (2005) claims that in 2003, Finnish e-learning companies (164 recognized companies in 2003) had a total turnover of € 139 million and total number of employees 1939 (based on survey by Lith, 2005). This possible decrease of turnover might be for several reasons e.g. the small size of domestic markets (few big customers, small growth), the lack of internationalization in business, the emerging fusions of companies and the new companies have a little experience in the field with small contact networks. Also commonly mentioned weaknesses include the lack of financial resources, and the business competencies and awareness of target markets as well as the low recognition of the companies (Matikainen, 2005).

To understand the context, companies were next researched via personal contacts and by checking companies' websites and information from the Finland's Register of Companies. After contacting, 61 of 151 companies confirmed involving in the development of e-learning environments. During this process, we found six more companies suitable for our next phase of research (web-survey). In addition, we examined Finnish Centres of Educational Technology and Finnish institutions of higher learning. From these e-learning development units, we contacted 17 people. Then we send a web-survey participation request to these 78 people. Thus, our research target population was the stakeholders involved in e-learning business or research.

Among respondents (N=50) the typical respondent was a 37 years old man (M = 37.33+/-1.43, Mdn = 35) working in business (80 %) with experience of teaching and training over 10 years (44%) and 5-10 years of experience of e-learning environments (39%). This result is in line with a salary survey conducted in USA (Elearning Guild, 2005), where among 1 103 respondents 40% had over 10 years in working in training, learning or eLearning in general and 35% was between 31-40 years old. We found that more experience (in years) of teaching was correlating (0.582 p=0) to the more amount of experience about learning environments (Figure 1.). Also respondents age was correlating between experience of teaching (0.606 p=0) and learning environments (0.353 p=0.014). Many of the respondents, while having totally different tasks, had a strong pedagogical background (degree in pedagogics). While the development of e-learning environment requires pedagogical knowledge, applying e-learning requires various professionals and participators. 2 000 people developing e-learning technologies, content and environments for over 2

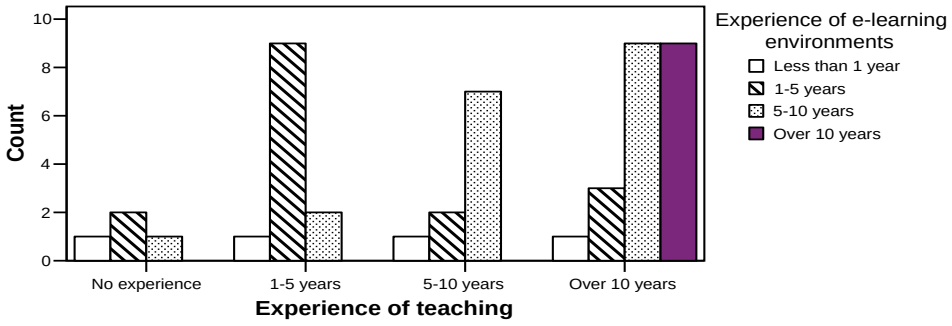

Figure 1: Respondents' experience of teaching and e-learning environments

million customers seem small. And there are reasons to widely participate, apply and elaborate e-learning, e.g. from educational perspectives.

Educational Perspectives

According to Organization for Economic Co-operation and Development annual comparison report of educational systems (OECD, 2005), based on data from 2003, together with Poland and France, Finland forms a group in which young people spend a long time in education, and education and employment do not alternate regularly. The share of those with a tertiary degree is high, one in three 25- to 64-year-olds. The share is higher only in Canada, the United States and Japan. Of non-OECD countries, the share of tertiary graduates is higher in Russia and in Israel. Finland‘s employment rate of higher education graduates exceeds the OECD average, while at other levels of education it is close to the OECD average. Participation in work-related adult education is high.

Education costs (est. € 6.3 billion in 2004) in Finland are reasonable on an international level, but the quality of education as measured by learning performance is high. The statutory intended instruction time is low and pupils in the 7- to 14-year-old age group receive slightly more than 5 500 hours of instruction per year, while at its highest; the intended instruction time in Italy is more than 8 000 hours per year. The amount of work outside school, such as homework, is also one of the lowest in the OECD countries e.g. in Korea, which has ranked high in the PISA surveys, pupils work outside school well over ten hours per week on top of a more than 30-hour school week. In our country’s comprehensive schools, the school week is in average 25 hours and pupils spend approximately five hours outside school doing homework and other schoolwork. In 2002, OECD countries invested in average USD 6 700 per student at all levels of education. The costs at the lower level of basic education were USD 5 300, on secondary education USD 7 100 and at tertiary level USD 10 700 per student. Research and development costs are included in these figures. In Finland, the mean costs at all levels of education were the OECD averages (Table 1). The costs at the lower level of basic education were USD 5 100, on secondary education USD 6 500 and at tertiary level USD 11 800 per student.

Table 1. Average cost of educational levels in Finland in 2004.

Education level	Learners (N)	OECD avg (USD)	Cost total (USD)
Preschool	55 089,00	5 100,00	280 953 900,00
Comprehensive	581 962,00	5 100,00	2 968 006 200,00
College	119 142,00	6 500,00	774 423 000,00
Secondary modern	134 852,00	6 500,00	876 538 000,00
Apprenticeship	35 175,00	6 500,00	228 637 500,00
University	174 324,00	11 800,00	2 057 023 200,00
Polytechnics	32 962,00	11 800,00	388 951 600,00
Total	**1 133 506,00**		**7 574 533 400,00**

The costliest education level is the comprehensive level, because of the amount of students. Secondly the University level, because at the upper level the instruction is more specialized and neglected to research, thus it is more demanding. From National Statistics database source, from 1995 to 2004, R&D costs in higher education, business and in public sector had increased from € 2.7 billion to € 5.3 billion. At the same time, the amount of research personnel has increased from 47 866 (1995), 74 743 (2003) to est. 76 500 (2004). This would mean that cost had increased 94% and personnel by 60% within nine years.

According to our former Minister of Education and Science, the main aim in the education sector during 2006 will be to promote the Lisbon Strategy. Discussion about lifelong learning and quality, equality and cost-effectiveness in education, as well as the utilization of R&D and innovation, are key factors in the promotion of the Lisbon Strategy. The government resolution on the structural development of the public research system announced has the following consequences. The higher education system will not be further expanded and the current higher education institutions will have to compile their resources into larger entities and boost networking, management and impact analysis. Universities need to improve their international competitiveness by sharpening their profiles and by investing in the quality of research, interdisciplinarity and internationally high standard research personnel. The organizations maintaining polytechnics, together with the Ministry of Education, will have to ensure that polytechnic units are of a sufficient size and comprise multiple fields and invest in high-standard education which responds to working life needs in the regions. A comprehensive plan for sectoral research demands that the intermediaries like technology and knowledge centres, development companies, science parks and business incubators will intensify cooperation amongst themselves and networking with public research organizations. Measures will be taken under the leadership of the Ministry of Trade and Industry to develop strategy processes linking up regional- and local-level players and innovation environments with national innovation policy. Connected with this, measures will be taken to strengthen the status and prerequisites of the technology centres.

Despite the good intent, from a working family man's point of view these figures of education and acts of development are not easy to understand. For example, there are over 3 400 comprehensive schools around Finland but the population is mostly centred in the southern part of the country. Thus, there is no strong economic reason to have so many comprehensive schools where the population is low or dispersed like in the rural area. As earlier noted the costs of comprehensive level are the highest. In municipalities, people are worried about what happens to the schools and to the quality of education if the municipalities are not given any state grants (yearly granted) for keeping small schools (some which have near 600 students) operative. The emerging is municipalities, where the average age is increasing. Younger people are moved out, because employment is more likely in the southern cities and in growing centres. In these centres the higher education institutions and vast selection of education possibilities plays crucial role for economical growth. Thus, we see two reasons for moving from rural area to cities; employment and education. What is difficult for rural area municipalities is that the most of people who go to the cities, to educate and foster their career, don't usually go back to the municipalities, because of the low level and amount of services available. Lack of services is related to municipal taxation, thus more working people means more resources in the municipalities. Although the distances are not long in Finland compared to Australia or USA, it is not seen economical to have family and workplace in different municipalities. People travel for working in other cities, but prefer their children go to school in safety and quality environment not far from home. However, family ties can be strong and occasionally people living in cities go to see their parents and relatives into the rural area. Still the concept of family is influenced by the economy. Fast, unpredictable circumstances and odds effect on to the welfare of the families. Depression is found to occur more in workforce and despite that babies in Finland have better health, among young people we have higher rates of suicide, the victims of more fatal traffic accidents, tobacco smokers, increase in diabetes, illness caused by asthma and allergies compared with other Northern region countries (Rasmussen et al, 2003). Reasons for these issues can be various (climate and environmental situations, genes etc.), but we think that one is that the young people are insecure about their future e.g. about their education suitability in the fast changing quartile economy.

According to the Ministry of Education, the welfare and international competitiveness is based on the vitality and innovativeness of the regions, which is promoted by means of regionally comprehensive education and research activities. This entails securing basic resources in all parts of the

country, coordinating the development aims of national education and science policy and regional policy; stepping up cooperation with local working life and other stakeholders, linking education and research with regional industrial and welfare strategies.

Discussion

If we look at these different perspectives, we note that economic decisions are not administrational decisions (Simon, 1976, p. xxvi). Thus, despite the good economical decisions, there are consequences that are not present or known during the preceding evaluation or decision-making. This, we think is important to inform and understand from different perspectives in order to achieve suitable solutions for emerging challenges. Skilful teachers and educators promote e-learning by participating in the development of those technologies and environments, which will make content providing and overall e-learning possible. In education, teachers are those who help students to learn. When deciding what teaching method to use, teacher will need to consider students' background knowledge, available environment, and the learning goals. Designers can offer various technologies and solutions for applying e-learning. Linking education and research with business require learning and collaboration with common goals. Informing these goals for the possible customers may enhance the trust and security.

Scaife & Rogers (1998) have discussed a methodology called - Informant Design – a methodology for use in developing educational applications. Much of the research uses psychological theory as the basis for designing interactive information tools for learning and training. However, Scaife regarded that process as incomplete unless we can bring our ultimate users and beneficiaries into the design process itself. They developed a way of involving children, teachers and software developers in what we call 'informant design'. This uses a mixture of low-tech and mid-tech methods, ranging from paper mock-ups to schematic software prototypes, to get our informants to co-construct the evolving software prototype. It is essentially a method for managing the economy of involving users who recognize that full participatory design is rarely possible, or desirable, for a development project.

Conclusion

Learning is a lifelong interaction amid developing and decision-making people. Learning technology can support this knowledge sharing by giving various accesses to meaningful information. E-learning can reduce the costs of education if the technology used is usable, cost-effective, time-saving and suitable for different educational levels and related goals. Despite the economic possibilities, the e-learning business in Finland is just starting. 1939 people is a quite small group. To overcome the educational challenge, the need of educated people in Europe, studies where young people participate into e-learning development and collaboration between stakeholders are essential. These could help to make administrative decisions that not prevent the possibilities for children to learn and educate themselves in a secure and familiar place while moving ahead in their lifelong learning. If the financial reasons are not adequate for participatory R&D with e-learning, then the future students and children should be the foremost reasons.

References

Häkkinen, P. (2002). Challenges for design of computer-based learning environments. *British Journal of Educational Technology. 33* (4), 461-469.

Khan, B. (2001). *Web-based training*. Englewood Cliffs, NJ: Educational Technology Publications.

Lewis, B., MacEntee, V., DeLaCruz, S., Englander, C., Jeffrey, T., Takach, E., Wilson, S. & Woodall, J. (2005). Learning management systems comparison. In *Proceedings of the Informing Science and In-*

formation Technology Education Joint Conference, InSITE2005. Available at http://proceedings.informingscience.org/InSITE2005/P03f55Lewis.pdf

Lith, P. (2005). Industry research in the field of know-how of the learning services. *Publications of Centre of Expertise for Digital Media*, Content Production and Learning Services

Matikainen, E. (2005). Business ecosystem perspective on internationalisation – small- and micro-size vendors in digital learning business cluster. In K. Mikkelä, K. Sibelius, H. Kivimäki, T. & Bergman, Learning business cluster in 2005. Report. Publications of Centre of Expertise for Digital Media, Content Production and Learning Services (pp. 3-9).

Massy, J. (2005). *Study of the e-learning suppliers' "market" in Europe*. Danish Technological Institute, Alphametrics Ltd, Heriot-Watt University.

McCullough, C. (2005 August 2). Obstacles to small business usage of elearning in Europe. *Webpronews*. Retrieved February 25, 2005 from http://www.webpronews.com/ebusiness/smallbusiness/wpn-2-20050802ObstaclesToSmallBusinessUsageOfeLearningInEurope.html

Mikkelä, K., Sibelius, K. & Kivimäki, H. (2004). Performance improvement technologies, solutions and services cluster, 2004 edition. Report. Publications of Centre of Expertise for Digital Media, Content Production and Learning Services.

Mikkelä, K., Sibelius, K., Kivimäki, H. & Bergman, T. (2005). Learning business cluster in 2005. Report. Publications of Centre of Expertise for Digital Media, Content Production and Learning Services.

Ministry of Education. (2004). Education and research 2003-2008. Publications of the Ministry of the Education, 2004:8.

Ministry of Education database (2005). Retrieved October 28, 2005 from http://www.minedu.fi/minedu/publications/online.html

Muukkonen, H. (2004 July 6). Training companies hard-pressed. *Economic Life*, p. 50.

National Board of Education database. (2005). Retrieved October 28, 2005 from http://www.oph.fi/english/SubPage.asp?path=447,490,3321

Nation Statistics institution database. (2005). Retrieved October 28, 2005 from http://www.tilastokeskus.fi/index_en.html

OECD. (2005). Education at a glance - 2005 edition. OECD Publishing.

Price, S. & Rogers, Y. (2004). Let's get physical: The learning benefits of interacting in digitally augmented physical spaces, *Computers and Education, 43* (1-2), pp. 137-151.

Rasmussen, N. K., Fridberg T. & Nielsen, J. (2003). Sustainable social and health development in the Nordic countries: statistics on the proposed for indicators. Report. The Nordic-Social-Statistical Committee (NOSOSCO) and the Nordic-Medico-Statistical Committee (NOMESCO).

Simon, H. (1976). *Administrative behavior* (3rd ed.). NY: The Free Press.

Scaife, M. & Rogers, Y. (1998). Kids as informants: Telling us what we didn't know or confirming what we knew already? In A. Druin (Ed.). *The design of children's technology: How we design, what we design, and why* (pp. 27-50). San Francisco: Morgan Kaufman.

Scardamalia, M., & Bereiter, C. (1993). Technologies for knowledge-building discourse. *Communications of the ACM, 36*, 37-41.

Tsai, S. & Machado, P. (2002). E-learning, online learning, web-based learning, or distance learning: Unveiling the ambiquity in current terminology. *eLearn, 7*.

Biography

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