Environmental Attitudes of Media Technology Students

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The environmental attitudes and opinions of EVTEK media technology students were surveyed as part of a larger study on the environmental sustainability in the Finnish printing and publishing industry. Data was collected through online questionnaires. The response rate was 10.9 %.

The findings revealed that students regard environmental issues as important. They see that media companies should invest more in environmental activities than what they do today. Especially print media students think that it is important to include environmental issues in the curriculum. There were some minor differences in the responses of digital media vs. print media, female vs. male and senior vs. junior student groups.

Students' views corresponded quite well with the views of industry experts and printing and publishing companies. Authorities, customers and company management are seen as the most important drivers for environmental action, while environmental organisations are not very important. However, book publishers consider environmental organisations more important and authorities less important than the other respondent groups.

Environmental education and training is needed both at the university and in the industry. The Finnish Ministry of Education promotes an integrated approach, where sustainability will be taken into account in all university activities. Environmental and sustainability issues would also be included in media technology courses in the future.

Introduction

In the 1990s, increasing environmental awareness led to active research on the environmental impacts of the printing processes. The focus of these studies was on eco-balances (Juntunen et al. 1994), life-cycle assessments (Dalhielm & Axelsson 1995, INFRAS 1998, Larsen et. al 2004) or energy efficiency (Westren-Doll 1997). Most findings pointed to papermaking as the main cause of environmental load. The interest in developing the printing process moved from scientific research to practical applications of environmentally friendlier materials and processes. The life cycle stages and their impacts are presented in Figure 1.

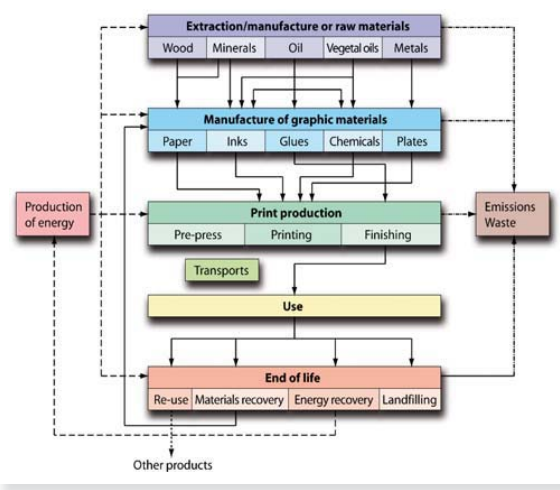

Figure 1: The life cycle of printed products and the environmental impacts (Viluksela 2008).

Nordic printing companies started to adopt voluntary environmental tools in the late 1990s. Most popular were EMSs (environmental management systems), based on the environmental management system standard ISO 14001, and the Nordic ecolabel for printed products, known as the Swan label (Nordic Ecolabelling 2007). Manufacturers of graphic materials – paper, ink, etc. – also developed environmentally friendly products, and equipment manufacturers improved the energy efficiency and develop resource-saving techniques.

At the same time, environmental legislation expanded to cover the larger printing companies. A permit system with emission limits was put in place in the EU countries, following the Integrated Pollution Prevention and Control (IPPC) directive and the Solvents Emission directive (EU 1996 and 1999). The most recent addition to the regulation is the EU reference document on Best Available Techniques (BAT), specifying the environmentally sound technical solutions and respective emissions for the main printing processes (EU 2007).

Despite these developments, printing and publishing industry does not seem to have clear environmental visions, drivers and leadership. At least in Finland, environmental issues have not been high on the agenda. Consequently, the available environmentally friendly solutions and techniques are taken into use quite slowly and in an inconsistent way. Furthermore, printed products are often seen as environmentally inferior when compared to the Internet and other electronic and digital media products (e.g. Schauer 2003).

Objectives of the study

This study formed a part in a larger survey of the environmental attitudes and views of the Finnish printing and publishing industry (Viluksela 2008). The main objective was to chart the attitudes, opinions and views of the media technology students on environmental issues. The aim was to find answers to the following questions:

- How much importance are students putting on selected environmental issues?
- Should media technology curriculum include environmental issues?
- Are students' opinions different from the opinions of experts and managers working in the printing industry?
- Are the opinions of various student groups different from each other?

The answers would contribute towards understanding the importance of environmental issues and to develop the media technology curriculum.

Methods

In this quantitative study, the research method was the survey. Data was collected with questionnaires and analysed with statistical means. The nature of the surveys is more descriptive than analytical (Gray 2004). Questionnaire surveys are cheap and quite flexible, and they can be used to reach a large number of respondents. Surveys can provide a degree of anonymity, and they are not influenced by a possible bias between researchers. Furthermore, questionnaires can be completed at the respondent's pace. The main disadvantage is that the responses lack qualitative depth and the results may remain superficial (Moore 1987).

Web questionnaires were used in order to facilitate the ease of responding and the data analysis and to make the data collection cost-effective (Gray 2004, Creswell 2003). Questionnaires were designed and managed using the eLomake service, which on one hand has rather limited layout possibilities, but on the other hand allows the data to be directly transferred to suitable computer software format for analysis. All questionnaires were pilot tested by one or two representatives of the target group.

The questions used in questionnaires usually fall into four main types (Gray 2004):

- Category questions, mainly used in classification of the respondents
- Ordinal scale questions (5-point Likert scale, e.g. "strongly disagree...strongly agree" or "not at all important...very important")
- Simple scale questions ("yes/partly/no" or "in use/tested/no")
- Open questions (to provide information or additional comments).

In this study, the two first types were used. The response was done by choosing the relevant answer or option, i.e. clicking a "radio button". Most of the choice questions also included a text field for additional information.

The target group consisted of the 384 students in the B.Sc. (Tech) programme of Media Technology at the EVTEK University of Applied Sciences (Espoo, Finland). Out of the student population, two thirds had digital media as their main topic, the rest were studying print media. Approx. 35 students (9.1 %) were in the adult education programme.

The questionnaire included some similar questions as the industry experts' questionnaire, but the statements and choices were adjusted to suit the target group. The invitation to participate in the study was distributed through the EVTEK web portal.

Results

42 of the 384 students replied to the questionnaire (response rate of 10.9 %). The respondents were classified in three ways, as described in Figure 2.

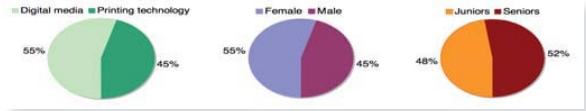

Figure 2: Classification of the respondents to the survey questionnaire.

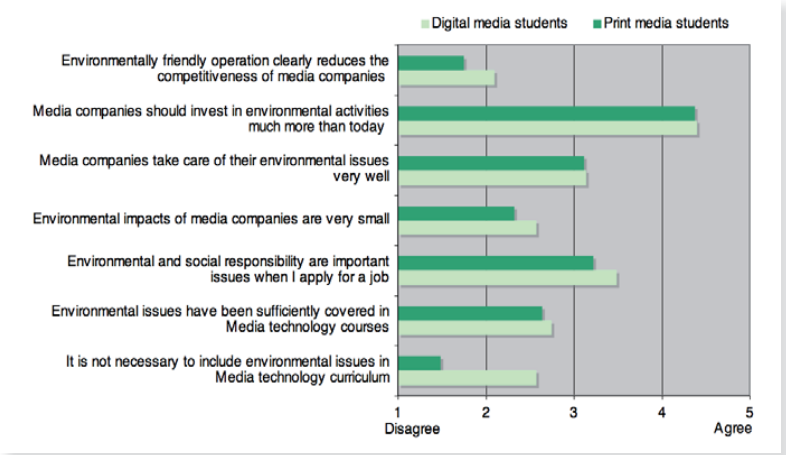

Figure 3: Responses of digital and print media students to the environmental statements.

- Statements

The first set of statements dealt with attitudes and views on environmental issues in the curriculum and in the media sector (Figure 3). The respondents agreed strongly that media companies should invest in environmental activities more than what they do today. According to another strong view, environmental activities do not reduce the competitiveness of companies. Print media students were strongly in favour of environmental content in the curriculum, while digital media students did not share this opinion.

- Environmental drivers

Which stakeholder groups are strong in promoting environmental action? This question was included in the questionnaires of all four of the survey groups: students, industry experts, printing companies and book publishing companies. Generally, the views and opinions of different respondent groups were quite similar with a few exceptions.

The role of company management was regarded as more important by digital media students than print media students (Figure 4). Female students saw environmental organisations and authorities as more important than male students (Figure 5). Junior students view authorities as the most important stakeholder group, while seniors choose customers as the strongest group (Figure 6).

When comparing the responses of all four survey groups (Figure 7), the following observations can be made:

- Authorities are seen as the main driver by three of the four respondent groups
- Publishers regard customers as the strongest driver
- Publishers also highlight the importance of environmental groups
- Printers do not see company owners as a very important driver.

All in all, the order of importance of the stakeholder groups was as follows:

1. Athorities
2. Customers
3. Company management
4. Company owners
5. Company employees
6. Environmental organisations.

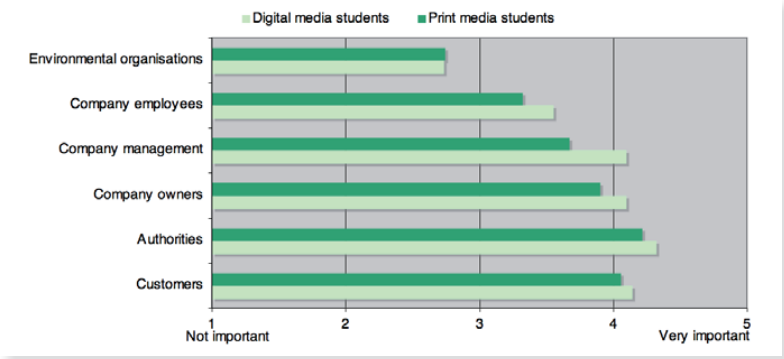

Figure 4: Responses of digital and print media students to the question "How important are the following stakeholders in promoting environmental practices in media companies?"

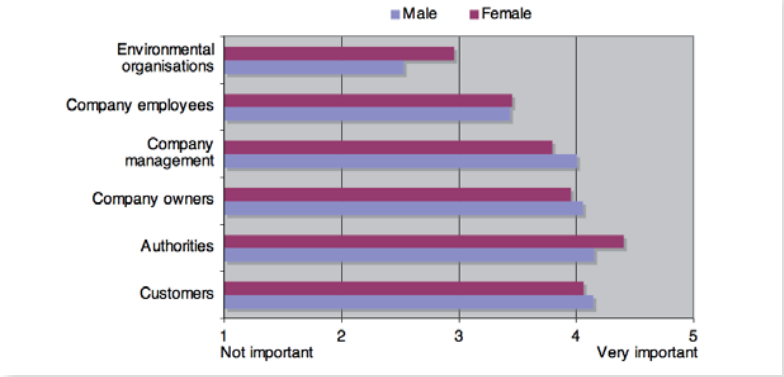

Figure 5: Responses of female and male students to the question "How important are the following stakeholders in promoting environmental practices in media companies?"

Figure 6. Responses of senior and junior students to the question "How important are the following stakeholders in promoting environmental practices in media companies?"

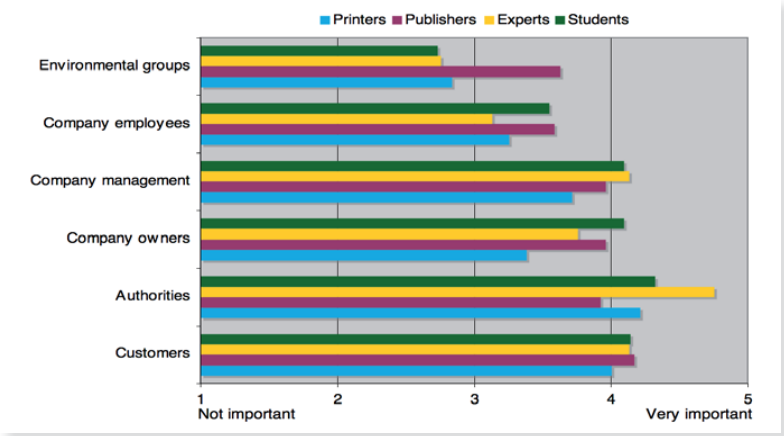

Figure 7. Responses of all four surveyed stakeholder groups to the question "How important are the following stakeholders in promoting environmental practices in media companies?"

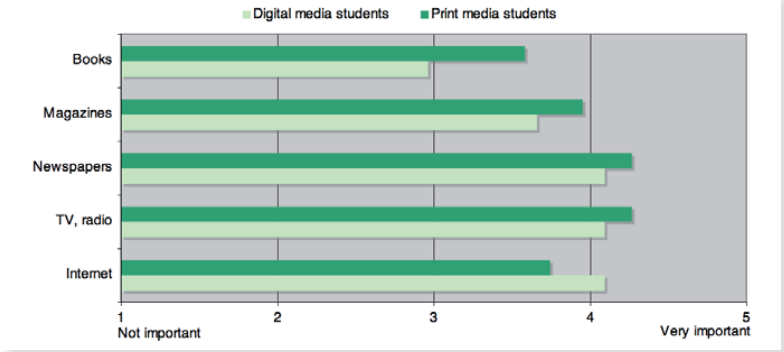

Figure 8. Responses to the question "How important are the following media in providing reliable environmental information?"

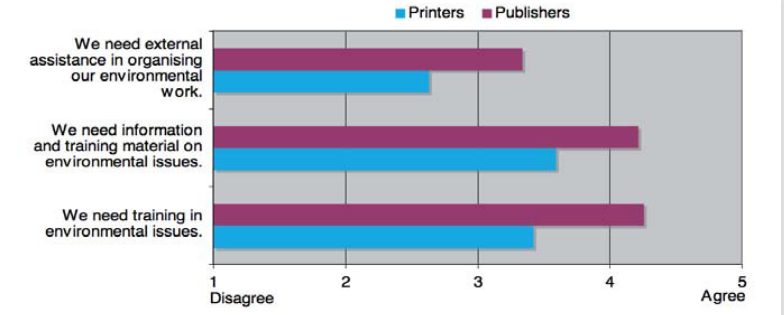

Figure 9. Responses of printing and publishing companies to the statements on training needs.

- Information sources

Where can one get reliable information about environmental issues? The responses are shown in Figure 8. Newspapers and broadcasting were seen important by both digital and print media students. Not surprisingly, digital media students also favoured the Internet while print media students preferred magazines and books.

- Training needs in the industry

Another interesting result worth mentioning was the question presented to printing and publishing companies about training and information of the environmental issues (Figure 9). There seems to be a clear need to provide training as well as training and information materials, especially to publishing companies.

Discussion

The study provided interesting information about the environmental views and attitudes of the respondent groups. However, the reliability and significance of the results is not very good, due to the low response rates (e.g. 5 % for the industry experts).

Students thought quite strongly for the increased environmental investments in media companies. Furthermore, especially print media students consider it important to include environmental issues in the courses of the media technology programme.

Students' views were quite uniform between different groups. Similarly, students' opinions did not differ much from those of the other stakeholders. The most interesting deviation is the opinion of book publishers regarding environmental organisations and authorities. The high importance for environmental activists is probably due to the campaigns of Greenpeace and some other groups, mainly targeted towards choosing papers made from raw materials of sustainable forestry. Authorities are not seen as the most important driver probably because publishing companies have no special obligations like the environmental permits and reporting that larger printers have.

Conclusions and recommendations

The outcome of this study reinforces the importance of environmental education in today's situation. Environmental awareness and training should be increased and developed both in the educational institutions as well as in the printing and publishing industry. Education should be made more interesting and targeted by, for example, combining classroom teaching with practical project work in printing and publishing companies. Both students and company staff would benefit from this kind of arrangement.

Would it be better to organise separate environmental courses, or to integrate environmental content into existing courses? This question needs to be assessed from different angles: learning outcome, teacher training requirements, available resources, etc.

In Finland, the Ministry of Education promotes an integrated approach. The principles of sustainability should encompass all activities of the educational institutions (Ministry of Education 2006). Integration of environmental sustainability into teaching requires an assessment of course contents and their relevant environmental issues. In addition, new courses may be required. A brief example in the context of EVTEK Media Technology courses is presented in Table 1. Some of the outlined changes are being implemented in connection with the preparation of new curriculum.

Table 1. Examples of EVTEK print media courses and their possible environmental content.

Course	Environmental content
Chemistry and the environment	Environmental impacts of printing processes and products Basic ecology Waste processing and legislation
Printing materials	Raw materials of paper and ink Substitution of harmless materials
Quality management	Environmental management systems and tools
Graphic design	Eco-design of printed products
Printing technology	Environmentally friendly processes Control of emissions Reduction of waste through automation
Paper technology	Sustainable forestry Emission control in pulping and papermaking Recycling of paper
Marketing	Environmentally conscious procurement Eco-labels and declarations
Production planning	Product specifications vs. environmental impacts
Packaging technology	Packaging waste and recycling
New course: Chemistry of printing	Chemical characteristics and handling of waste fractions VOC emissions, their impact and reduction

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[1]EVTEK and Stadia were merged into Helsinki Metropolia University of Applied Sciences on 1 August 2008.

References

[1] Creswell, J.W. (2003). Research design. Qualitative, quantitative, and mixed methods approaches. Sage Publications, Thousand Oaks, California. 2003.
[2] Dalhielm, R., Axelsson, U. (1996). Miljöprofilering– Livscykelanalyser av grafiska produkter. Teknikrapport nr 4/95. Institutet för Medieteknik, Stockholm. [In Swedish]
[3] Gray, D.E. (2004). Doing research in the real world. Sage Publications, London, 2004.
[4] EU (1996): Council directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control. OJ L 257, 10.10.1996.
[5] EU (1999): Council directive 1999/13/EC of 11 March 1999 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations. OJ L 85, 29.3.1999.
[6] EU (2007): Reference Document on Best Available Techniques on Surface Treatment using Organic Solvents. European Integrated Pollution Prevention and Control Bureau (EIPPCB), Seville, January 2007.
[7] INFRAS: A Life Cycle Assessment of the production of a daily newspaper and a weekly magazine. Short version of the study. A project of Axel Springer Verlag, Stora and Canfor. 1998.
[8] Juntunen, S., Helle, T., Vasara, P. and Villikka-Storm, J. (1994). Painetun viestinnän ekotase – Loppuraportti. (Eco-balance of the printed communication – Final report). TEKES, Graafisen alan teknologiaohjelma. [In Finnish]
[9] Larsen, H.F., Hansen, Morten Søes, Hauschild, Michael (2004): Ecolabelling of printed matter Part II – Life cycle assessment of model sheet fed offset printed matter.
[10] Ministry of Education (2006): Kestävää kehitystä edistävän kasvatuksen ja koulutuksen strategia ja sen toimeenpanosuunnitelma vuosille 2006–2014. (Strategy and plan of action for education and training supporting sustainability for the years 2006–2014.) [In Finnish]
[11] Moore, N. (1987). How to do research. Second edition. The Library Association, London. 1987.
[12] Nordic Ecolabelling (2005): Swan labelling of printing companies 4.0. PDF Document (http://www.svanen.nu)
[13] Viluksela, P. (2008): Environmental sustainability in the Finnish printing and publishing industry. Licentiete thesis. Helsinki University of Technology, Forest Products Department.
[14] Westren-Doll, J., Innanen, J. and Väisänen, T. (1997): Teollisuuden energiatehokkuusindeksi: Graafinen teollisuus (The energy efficiency index of the industry: Printing industry). Motivan julkaisuja 2/97. [In Finnish]