

## **Perception of environmental accounting**

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### **Abstract**

In the previous years, accounting has focused on the measurement and reporting of environmental issues as a part of social responsibility principle. Application and adoption of environmental accounting as a tool of managerial accounting for reporting and for company decisions is required, since environmental information as output of environmental accounting becomes more and more important. Environmental accounting is a necessary tool for the businesses and provides different stakeholders with accurate, reliable and relevant environmental information presented and used in annual reports, corporate sustainability and corporate responsibility reports and environmental reports. As declared in European Commission 2011-2014 Corporate Social Responsibility Strategy Report, academic researches relevant training materials should take more place in the curriculum for the education of more sensitive generations on environmental issues. These paper measures perception of bachelor degree business administration students and their concerns for environmental issues by the primer (Fleischman and Schuele, 2006), including environmental accounting and environmental management accounting with the case studies on reporting, best practices. The primer, divided into two parts, explore a brief rationale directed to accounting professors for allocating precious class time to environmental reporting, and a much fuller exposition for students of the associated issues past, present, and future that will serve to generate classroom discussion. The results show that the primer used in the research has effect on the change of perception. Therefore, increasing awareness about environmental issues, environmental accounting should be valued more in the curriculum and increasing environmental accounting literature with cases and best practices is of most importance.



Keywords: Environmental Accounting, Environmental Management Accounting, Social Responsibility

## **1 Introduction**

Application and adoption of environmental accounting as a tool of managerial accounting for reporting and for company decisions is required. For accurate, reliable and relevant environmental information presented and used in annual reports, corporate sustainability and corporate responsibility reports, environmental reports and in any reports in any format or under any name, businesses should try to define environmental costs incurred while providing goods and services to their customers. At this point, environmental accounting is a necessary tool for the businesses (Fleischman and Schuele 2006).

Environmental accounting is designed for internal and external financial information users for identifying, calculating and reducing environmental costs for accurate assessment of environmental performance and increasing efficiency (Fleischman and Schuele 2006). There are many reasons and benefits of applying environmental management accounting. Briefly, environmental management accounting deserves attention of management due to following reasons (Fleischman and Schuele 2006)<sup>1</sup>:

- identify environmental costs for more accurate product pricing,
- identify hidden environmental costs in overhead accounts,
- decrease or eliminate environmental costs,
- gain competitive advantage by designing more environmentally preferable processes, products and services,
- meet obligations of national or international environmental laws,
- increase company value by enhancing customer value.

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In this paper, the perception of bachelor degree business administration students and their concerns for environmental issues based on the primer from Fleischman and Schuele (2006), including environmental accounting and environmental management accounting with the case studies on reporting best practices was measured.

The rest of the paper is divided as follows. Section 2 presents theoretical background on environmental accounting. In Section 3 data, methodology, results and findings of the empirical research are presented. Conclusions are formulated in Section 4.

## **2 Why we need environmental (management) accounting**

Environmental accounting is a specific type of accounting. Organizations are increasingly recognizing the broader environmental information needs of a wider range of stakeholders and environmental management accounting.

There are several limitations of conventional management accounting systems and practices, that can make it difficult to effectively collect and evaluate environment-related data. These limitations can lead to management decision making being based on missing, inaccurate or misinterpreted information. As a result, managers may well misunderstand the negative financial consequences of poor environmental performance and the potential costs and

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<sup>1</sup>The list stated above is combined of US EPA (1995), Bennett and James (2000).



benefits of improved environmental performance. Some of the culprits are limitations of general management accounting as practiced in some organizations. Other limitations are more specific to environment-related information (IFAC 2005, 26; Popescu et al. 2008, 117).

Communication/links between accounting and other departments often not well developed. An organization's environmental personnel often have a great deal of knowledge about environmental issues and impacts. Similarly, technical staff may have considerable experience with the flow of energy, water and other materials throughout an organization. Environmental and technical personnel, however, often have little knowledge of how those issues are reflected in the accounting system (IFAC 2005, 26). Often, they also do not have entry permits into the financial subsystems (Jasch 2009, 6). On the other hand, the accountant or controller has a lot of top down financial information at hand, but often has little knowledge on the actual physical flow of materials and energy through production, the environmental impacts related with them and the environmental relevance of corporate activities (Jasch 2009, 6). Different departments may also have different goals and perspectives with respect to EMA-type activities. For example, they may not have the same perspectives on the issue of who is responsible for managing different types of environment-related costs. Production centers, which may produce waste but do not have data on the costs of waste disposal? The design department, which selects the materials, equipment and processes used? The environmental manager, who does not produce waste but must dispose of it? The accounting department, which may inadvertently "hide" environment-related costs by placing them in general overhead accounts (IFAC 2005, 26)?

Environment-related cost information is often "hidden" in overhead accounts. A key criticism of conventional management accounting is that it largely considers environmental costs to be immaterial in proportion to the organization's total costs. Additionally, some environmental costs are not separately identified or tracked (Buritt 2005, 29). There are numerous examples of potentially important environment-related costs being inadvertently hidden in the accounting records, where a manager who would benefit from that information can not find it easily. One particularly common way to inadvertently hide environment-related costs is to assign them to overhead accounts rather than directly to the processes or products that created the costs (White & Savage 1995). While overhead accounts are a convenient way to collect costs that may be difficult to assign directly to processes or products, this practice can create problems later if a manager does not know where to look for the needed cost information. It might not be immediately obvious to a manager that an account called 'Divisional Overhead' contains information on environmental permit fees, training costs and legal expenses. The inclusion of potentially significant environment-related costs in overhead accounts may also obscure which are fixed costs that are difficult to reduce and which are variable costs that could be reduced by preventive environmental management (IFAC 2005, 27). The use of overhead accounts for environment-related costs can also be problematic when overhead costs are later allocated back to cost centers (processes, products or services) for pricing and other purposes. Overhead costs typically are allocated back to cost centers using a variety of allocation bases, such as production volume, machine hours, personnel hours, etc. This might, however, be an inaccurate way to allocate some typical environment-related costs. An example would be hazardous waste disposal costs, which might be quite high for a product line that uses hazardous materials and quite low for another that does not. In this case, the allocation of hazardous waste disposal costs on the basis of production volume would be inaccurate, as would be product pricing and other decisions based on that information (IFAC 2005, 27). Organizations have taken different approaches to resolving the issue of hidden environment-related costs. One common solution is to set up separate cost categories or cost



centers for the more obvious and discrete environmental management activities (IFAC 2005, 27). Often, a cost center for environmental, health and safety management is being installed. But for significant environmental costs a posting to production cost centers or product costs would be preferable. Especially the costs for waste disposal and related material input losses should be posted to the production steps involved and remain in the responsibility of the production managers. This is also promoted by material flow cost accounting (Jasch 2009, 8). The less obvious costs that will still appear in other accounts and cost centers can be more clearly labeled as environment related so that they can be traced more easily. An assessment of the relative importance of environment-related costs and cost drivers of different process and product lines, in line with the general practice of Activity Based Costing (ABC), can help an organization determine whether or not the cost allocation bases being used are appropriate for those costs (IFAC 2005, 27).

Materials use, flow and cost information often is not tracked adequately. Although larger companies annually generate millions of data records concerning material movements from Enterprise Resource Planning (ERP), Production Planning Systems (PPS) and other software systems, the available information often is still not sufficiently accurate or detailed for environmental, efficiency and other decision-making purposes. (IFAC 2005, 27). If the system has been installed from a pure financial accounting perspective, the information related to materials inputs, flows, fates and related costs is often not tracked adequately. (Jasch 2009, 8).

Investment decisions are often made on the basis of incomplete information. The fact that environmental costs are not fully recorded often leads to distorted calculations for improvement options. Environment protection projects, aiming to prevent emissions and waste at the source (avoidance option) by better utilizing raw and auxiliary materials and requiring less (harmful) operating materials are not recognized and implemented. The economic and ecological advantages of such measures are not realized. The people in charge are often not aware that producing waste and emissions is usually more expensive than disposing of them (Jasch 2009, 9).

### **3. Empirical research**

As declared in European Commission 2011-2014 Corporate Social Responsibility Strategy Report and academic researches (Fleischman and Schuele, 2006; Mathews, 2001; Bebbington and Thomson, 2001, Gray et. al, 2001) an important issue how to raise environmental awareness is through teaching. Relevant training materials should take more place in the curriculum for the education of more sensitive generations on environmental issues.

#### **3.1 Data and methodology**

In this research bachelor degree business administration students who were enrolled in accounting classes before were selected as the sample. Difference in students' perception of and concerns for environmental issues were statistically measured by the primer including environmental accounting and environmental management accounting with the case studies on reporting best practices. The methods and questions used in testing are derived from the study of Fleischman and Schuele (2006). The collected dates were analyzed with the SPSS software, a descriptive analysis of the variables and one-way analysis of variance (One-way ANOVA) was used to test the hypothesis: A primer has significant effect on the change of perception of bachelor degree business administration students.



### 3.2 Results and findings

Classroom testing was performed within the bachelor business administration students at the Faculty of Economics and Business University of Maribor, first year of the bachelor study. 58 % of them were female and 42 % male population (N=109). The testing was divided into following steps. In first step, the lecturers administered a first questionnaire for the assessment students' perception of concerns for to environmental issues. In the second step, it was asked to read the material (referred to as 'the primer' by Fleischman and Schuele 2006). The primer, translated in Slovene language, includes information about:

- environmental accounting,
- environmental management accounting,
- a summary of environmental management accounting application of Xerox,
- a brief information about BP Oil Spill- Gulf of Mexico, and
- a section from Apple Environmental Responsibility Report 2014.

Third step was watching the slides show about environmental cost accounting and NASA images from the space about Oil spill in Gulf of Mexico<sup>2</sup>. After that, the survey was done again (fourth step). Each of the two questionnaires' contains Likert-scaled items ranged from one to five.

The results (men change in response) of questions perceptions of and concern for environmental issues, and student opinion on the need for and chance of various parties taking action on these issues are presented in table 1.

Table 1: Students' perception/awareness of and concern for environmental issues before reading, after reading

Questions (N-109)	MR	MR	Diff.
	Before Reading Premier	After Reading Premier	
1) How would you rate your awareness of environmental concerns <sup>a</sup> (pollution of air and water, global warming, acid rain, toxic waste)?	2.21	2.04	-0.17
2) Do you feel young people of your generation are more aware of/concerned about environmental issues <sup>b</sup>	3.24	3.19	-0.05
3) Do you believe that environmental action should be mandatory ethically for <sup>c</sup>			
- Every individual	2.05	1.75	-0.30
- Business	1.61	1.50	-0.11
- Public accountants	2.48	1.98	-0.50
- Governments	1.38	1.35	-0.03
4) How would you rate the chances of the following institutions to achieve a betterment of environmental conditions <sup>d</sup>			
- Big business	2.33	2.08	-0.25
- Government	2.20	2.06	-0.14
- International organizations (UN):	2.02	1.86	-0.16

<sup>2</sup> These materials are available at [http://education-portal.com/academy/lesson/full-cost-accounting-definition-example.html#lesson\\_faydalanılmıřtır](http://education-portal.com/academy/lesson/full-cost-accounting-definition-example.html#lesson_faydalanılmıřtır) and [www.nasa.gov/goddard\\_ve\\_NASA | Satellites View Growing Gulf Oil Spill](http://www.nasa.gov/goddard_ve_NASA|Satellites_View_Growing_Gulf_Oil_Spill) and <http://youtu.be/mCWW5xt3Hc8>.



- Private agencies (Greenpeace):	2.11	2.04	-0.07
<sup>a &amp; b</sup> 1) very aware 2) somewhat aware 3) unaware 4) moderately unaware 5) very unaware;			
<sup>c</sup> 1) definitely 2) very probably 3) probably 4) probably not 5) very probably not			
<sup>d</sup> 1) very good 2) good barely 3) acceptable 4) poor 5) very poor			
*significant at % 5 level.			

Source: Questions by Fleischman and Schuele, 2006; calculation - own research.

The results shown in Table 1 indicate that, overall, both the reading and class discussion increased students' awareness of and concern for environmental issues, and strengthened their beliefs about the chance of the institutions (big business, government, international organizations and private agencies) to achieve a better environmental conditions.

After watching the slides show about environmental cost accounting and NASA images form the space about Oil spill in Gulf of Mexico the survey was done again.

Table 2: Students assessment of interest and comprehension of the premier

	Mean Response (N=109)
The environmental management accounting	
<i>understandable</i>	3.43
<i>interesting</i>	3.00
Environmental Reporting	
<i>understandable</i>	3.64
<i>interesting</i>	3.26
The cases (Xerox, BP Oil spill Mexico and Apple)	
<i>understandable</i>	3.82
<i>interesting</i>	3.77
NASA Images Oil Spill	
<i>understandable</i>	3.92
<i>interesting</i>	3.72
Slide Show about Environmental Management Accounting	
<i>understandable</i>	3.85
<i>interesting</i>	3.65
1-not understandable 5-understandable; 1-totally boring 5-interesting	

Source: Questions by Fleischman and Schuele, 2006; calculation - own research.

In Table 2, student opinion on the premier's understandability and interests are summarized. Students found cases interesting as well video and slide shows with animation and sound. Less interested were readings. They mentioned that they'd like to watch and listen the topics and they like to share videos compared to documents in social media. They told that they believe that videos, slide shows with sound and animation are giving more information in a short time. It is also in line with the characteristics of generation Z. They want to be a part of social, visual and technological improvements.

#### 4 The findings and conclusions of the paper with thoughts and suggestions for further research

In this study, bachelor degree business administration students who were enrolled in accounting classes before are selected as the sample. Difference in students' awareness of and concerns for environmental issues is statistically measured by the primer including



environmental accounting and environmental management accounting with the case studies on reporting, best practices. According to the results of this research, the primer prepared for this study has considerable influence on the change of awareness. To raise a generation that is well aware of environmental issues, environmental accounting should be valued more in the curriculum. Increasing environmental accounting literature with cases and best practices is of utmost importance.

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