

Adoption of Activity-Based Costing: A Survey of the Education Sector of Greece

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Abstract The need to invest in education becomes evident during difficult economic periods. Nevertheless, the lack of sufficient financial resources leads educational institutes to form competitive cost strategies. Despite the increasing competition in the education sector, educational institutes usually refrain from using complex cost methods to improve their operations. In this study, we chose the activity-based costing (ABC) method to understand the reaction of educational institutes when they are confronted by the implementation of innovative cost methods. An institute willing to implement ABC should be capable of comprehending the associated operational adjustments. This study investigates the education sector's potential in adapting to the ABC method to improve cost management. Additionally, factors that prevent educational institutes from making cost strategy reforms were also observed. Initially, we conducted semi-structured interviews of experts to develop our research instrument. The survey was then applied to 152 educational institutes located in the seven most populous regions of Greece. The findings of the hierarchical regression analysis indicate that educational institutes are not capable of accurately allocating costs and they lack specific data concerning overheads. However, the sector is more eager to implement sophisticated methods for increasing competitiveness than was anticipated.

Keywords Activity-based costing · Education · Greece · Cost strategy

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Introduction

The growing desire to understand the nature of costs and understand the factors that drive an educational institute's cost behavior require competitive cost measurement methods. Ferreira (2011) mentions the importance of precise costing for decision making. Activity-based costing (ABC) can help educational institutes acquire detailed costing data and discern possible hidden costs that they may have previously been unaware of.

Educational institutes should be able to identify curriculum costs and profitable activities. In that respect, ABC can help develop a cost system that is suitable for them to improve their operations and profitable activities. ABC, after estimating net profits, measures the actual cost of recourses and directly links them to activities. As compared to traditional costing methods, the ABC method ensures accurate cost-benefit analysis and performance improvement. Institutes that can identify costly services, give better results with regard to their efficiency in decision making.

Furthermore, the accounting department should have a clear point of view regarding the percentage of indirect costs incurred on the institutes' primary services (e.g., teaching). To define the accurate cost per service, direct costs should be allocated to different activities of the institute (Karagiorgos and Papatsouma 2006).

Sophisticated cost methods are not widespread in Greece's education sector. Most cost accounting is limited to traditional methods, employed to collect basic accounting data, and used for taxation purposes. The interviews of administrative staff members and heads of accounting departments revealed that cost data needed for the application of ABC are unofficially available and recorded through partially implemented, non-traditional costing methods. This was an encouraging revelation that indicated the usefulness of the ABC method and the ease of its implementation, which is less than anticipated. Additionally, activity-based management can serve as a useful information system to support the decision making processes for effective operations (Gupta and Galloway 2003).

Greece's education sector is a multilateral example of varied private and public institutes. The educational services offered are designed for a broad audience, ranging from basic education for minors to lifelong learning for adults. This paper tries to understand institutional ability to collect cost data and use sophisticated costing methods to assist decision making and gain competitive advantage. It aims to identify the pros and cons of adopting the ABC method by a willing educational institute. The findings supporting the need for ABC, even by some smaller educational institutes, imply that regardless of the geographic region or economic conditions, the education sector can exhibit improvement in its operations through more accurate cost strategies.

Activity-Based Costing

ABC traces the direct and indirect costs of products, services, distribution channels, and customers. The displacement of direct expenses is attributable to the gradual proliferation of product types and service lines (IMA 2014). Organizations offer an increasing

variety of products through complex distribution channels to many customers. This excessive plethora of activities results in high overhead expenses. Traditional costing methods are ineffective in allocating these costs as they are unrelated to a specific type of activity (Kaplan and Anderson 2007).

According to ABC, resource consumption is the source of different cost types, which it allocates to activities that provide products, services or customers. A comparison between traditional costing methods and the ABC method revealed that firms were unaware of hidden losses resulting from product costs exceeding process costs (Akyol et al. 2007). However, estimating the ABC model is difficult as the current accounting system does not support data collection (Kaplan and Anderson 2007).

Traditional costing methods do not display significant distortions in overheads, which leads to over-costing of activities. ABC allows institutes to re-price their outputs, select pricing strategies, and gain competitive advantage. It is a useful decision making tool that permits the analysis of overhead and fixed operating costs for identifying non-value added activities (Yahya-Zadeh 2011).

ABC identifies the cost of quality, which is the cost resulting from reduced profitability. With respect to the services provided, institutes can identify the processes that cost more than the optimal by monitoring the cost flow. ABC allocates salaries to activities through surveys and assesses the added cost of improving quality. By recognizing the improvement margin, an institute can increase profitability, while providing better services and increasing its market share and level of client conformity and satisfaction, and improving its public relations (Ruhupatty and Maguad 2015).

ABC is considered an alternative understanding of business processes and measures the level of competitiveness of an institute. Institutes should be able to define inaction cost, idle time, and defective service costs. The conversion of quality issues into monetary terms via ABC allows the management to evaluate problems and identify cost-reducing opportunities (Ruhupatty and Maguad 2015).

Assigning resource costs to activities and activities to cost objects is a complex procedure. Thus, factors related to a change in activity costs, called "cost drivers", were chosen to allocate resources and activities (Karagiorgos and Papatsouma 2006). Cost drivers are divided into two types, resource-consumption and activity-consumption. Resource-consumption cost drivers measure the amount of resources consumed by an activity. The consumed resource costs are then assigned to a particular activity or cost pool. An activity-consumption cost driver measures the activity performed in relation to a cost object. It is used to assign activity cost pools to specific cost objects (Kokins 2010).

Introducing ABC into Educational Institutes

An educational institute allocates costs depending on its services or facilities. The main cost drivers used are either the working hours of the staff or the number of students. (Karagiorgos and Papatsouma 2006). ABC is a strategic management tool capable of improving cost strategy and measuring indirect costs. Furthermore, it can improve the quality of data through better cost tracing, selecting, and matching cost drivers to cost centers. Activity cost centers are decided depending on the sum of the primary cost drivers and they allocate costs to service-user activity cost pools (Goddard and Ooi 1998).

ABC provides rational allocation of overheads to different departments and activities. The institute is then granted a surplus of resources, which it reallocates. Furthermore, ABC ensures that the faculty is charged with the actual consumption of resources and usage of facilities (e.g., library and chemistry labs) by providing an internal taxation system (Goddard and Ooi 1998). Therefore, ABC can facilitate decision making, planning, and organizational improvement (Maelah et al. 2011).

Proper cost information and resource allocation offer better cost control in profitable activities identification (e.g., courses, degrees, activities). As such, ABC helps design courses with respect to their associated costs and highlights the services that need to be altered (Naidoo 2011).

We realized that ABC is avoided by educational institutes (Goddard and Ooi 1998). However, most studies indicate ABC's usefulness in helping educational institutes achieve high organizational competitiveness (Naidoo 2011). Coskun and Yılmaz (2013) in their study of a Turkish private high school discuss the importance of pricing in an educational institute's strategy for achieving a better market position.

In the case of higher educational institutes, competitiveness, quality, and efficiency are essential (Krishnan 2006). ABC is proposed as a suitable tool for the acquisition of accurate cost data (Ruhupatty and Maguad 2015). It can be applied in universities since cost allocation is not based on certified methods. Furthermore, ABC can help higher educational institutes keep overhead costs lower than other expenses (Neely and Tucker 2010). It is noteworthy that the majority of European universities elected partial implementation of ABC to separate the direct and indirect costs of financed projects. When implemented for all institute activities, despite the initial difficulties, ABC ensures accountability (Lutitsky and Dragija 2012).

Characteristics of Educational Cost

For most educational institutes, cost is defined as a monetary measure that represents the sum of wealth invested in resources to provide services and in turn gain revenues or fulfill social needs. Usually, an educational institute allocates resources for student groups or classes. Educational institutes could classify their services as educational, supplementary, or administrative (Karagiorgos and Papatsouma 2006). Apart from the costs of teachers, classroom usage is essential for estimating time consumption and evaluating costs. Other expenses include electricity, supplies, and depreciation costs. For most institutes, adopting a process of collecting and analyzing time records would require the development of information systems and more sophisticated methods.

Such activities as maximizing classroom utilization, teaching and developing extra teaching materials face cost concentration problems. Proper direct and overhead cost allocation is very important while planning them. It is understandable that, while teaching is one of the most important activities, an institute should also allocate costs to its secondary activities. Universities usually select their own cost accounting methods, including cost drivers and activities (Toompuu and Põlajeva 2014). Higher education functions in a period of limited resources and slow growth rates. Hence, an institute's activity cost assessment is vital for decision making (Cropper and Cook 2000).

Education in Greece

In Greece, public and private educational institutes are supervised by the Ministry of Education and Religious Affairs (MERA). This leaves most institutes with little space for improvement and development with regard to implementation of better costing strategies. However, the current fiscal crisis makes cost effective reforms mandatory. To understand the case of Greece, one must first understand its market (Eurydice Network 2009).

Students aiming for higher public education must succeed in their final national examination in their final year of high school. Private institutes for higher education receive considerably fewer students as compared to public institutes. Higher educational institutes are fully self-administered legal entities of public law established and acting in compliance with special legislation.

There is a strong demand for higher public education in Greece. Lambropoulos and Psacharopoulos (1992) argue that the lack of fees and nonexistent direct costs are significant to the demand of higher public education in Greece. Furthermore, individuals choose their studies according to their social status and not their employment prospects (Psacharopoulos 2003). In addition, university students can remain in the university indefinitely as there is no provision for their expulsion due to poor performance (European Commission 2014).

The majority of the private institutes (70%) are concentrated in the main urban centers, which include the capital city of Athens and Thessaloniki, the second most populous city in Greece. Only 5.7% of students attend private schools for primary and secondary education. The number of students attending private schools has declined since 2011 (6.8% drop in 2013; 4.3% drop in 2011).

Private education attendance is mostly affected by the socioeconomic state of Greece. Household income decreases due to unemployment rates and taxation, forcing students or their families to consider public educational institutes. The private education sector tried to reduce its tuition fees by 12.8% for middle school, 6.6% for preschool, and 6.8% for primary school (Hellenic Statistical Authority 2014).

Unlike the majority of private schools in the European Union (EU), which belong to non-profit organizations, most of Greece's private schools are family-owned businesses. Most primary and secondary education students in the EU (86%) attend public schools or state-funded private institutes. In Greece, there is no state funding through annual subsidy or lower taxation levels for private schools; hence, the pressure of tuition fees falls solely on household expenses. Furthermore, the Greek tax legislation system considers a familie's or individual's ability to pay the tuition for private education as a sign of wealth. Thus, at the end of the year, they are taxed more if they attend educational institutes that require paying for tuition. Considering the current fiscal crisis, extra taxation affects Greece's private education sector.

Methodology and Results

Research Approach

The environment of the Greek education system is marked by some important features. Free public education and top management exercised by the Ministry of Education

leave most institutes (both public and private) with little scope for development with regard to implementation of better cost strategies. Even in the case of higher institutes, which have autonomy in their decisions, public funding is one of the main sources of income. However, the current fiscal crisis has made cost effective reforms mandatory.

We examined the reasons for these peculiarities of the ABC method. The interviews helped us form questions that could produce real data, thus giving us an insight into the internal policies that hinder or help the implementation of the ABC method. Even in cases where the ABC method was used, the staff did not always understand its basics and the management could not consider it a strategic tool. The latter was achieved through questions that require inference to confirm the existence of ABC knowledge within an organization.

This study adopts a mixed data collection method using primary and secondary sources. The questionnaire was developed based on information derived from the existing literature and the semi-structured interviews of 19 experts in the field (accountants and academics), which too were based on the existing literature (Minichiello et al. 1995). The information was analyzed with thematic analysis (Braun and Clarke 2006). The questionnaire contains three parts. The first consisted of three items with a dichotomous response option, aimed at gathering general information such as the existence of a separate finance department and/or an outsourced accountant within the institute, and the respondent's awareness of the cost accounting method used.

The second part compiles a set of 19 items, each on a five-point Likert scale, extracted from the thematic analysis. The four themes identified were related to (1) cost accounting functionality, (2) ability to control costs, (3) cost management capabilities, and (4) evaluation of the organization's capabilities. The third part contains seven closed format questions that aim to identify the strengths and weaknesses of educational institutes adopting the ABC method. The questionnaire ends with questions related to the personal and demographic data of the respondents.

A proportionate stratified random sample procedure was used according to the type of institute. Given the geographical dispersion of the sample units, a web-based survey was conducted. The sample is comprised of accounting departments of educational institutes and the accounting offices that are collaborating with educational institutes. Out of 13 regions in Greece, we chose the seven regions with the largest educational institutes (schools, universities, and private institutes). A total of 350 questionnaires were distributed through e-mail to their internal or external accounting departments. The average response rate was 43.4% (152 questionnaires), 66 questionnaires from primary and secondary education private schools, 42 from accounting offices, 33 from public schools, 6 from universities and 5 from conservatories.

The internal reliability of the questionnaire was tested using Cronbach's alpha. Prior to the reliability test, principal components analysis (PCA) with varimax rotation was applied to the data for factor extraction. Finally, hierarchical regression analysis was adopted to identify the significance of potential constraints on the number of identified factors. The PCA method suggested a five-factor solution, which accounted for 69% of the total variance. All of the 19 original items (variables) were retained in the factors as the factor loadings were found to be greater than or equal to 0.4 (Hair et al. 1998).

The fifth factor contained only one item (satisfaction with the operational level of the organization) which also loads on the third factor. Therefore, given its secondary loading, it was moved to the third factor. Table 1 contains the items of the five factors and their corresponding factor loadings, eigenvalues, and explained variances. The reliability of the questionnaire is satisfactory as indicated in Table 2. The estimated values of Cronbach's alpha for each factor and for the entire scale were found to be above the minimum requirement of 0.70 (Nunnally and Bernstein 1994).

Table 1 Results of principal component analysis ($N=152$)

Items	Factors				
	1	2	3	4	5
1. The accounting office has significant influence on cost management.	0.455				
2. The head office has significant influence on cost management.	0.770				
3. The organization knows how much each department is spending.	0.812				
4. The degree of cost allocation by division is good.	0.757				
5. The organization has a good idea about how much it spends on each procedure.	0.533				
6. The administration correctly allocates the cost per procedure.	0.678				
7. The administration correctly allocates the cost per department.	0.752				
8. The degree of cost allocation by division is good.	0.589				
9. The accounting office knows how much each department spends.		0.736			
10. Different departments' supervisors are involved in the costing procedure.		0.569			
11. The administration listens to the opinions of employees for the costing procedure.		0.706			
12. Specific departments absorb plethora of resources with respect to their needs.		0.445			
13. Competing institutes have exhibited a better image of their business.			0.659		
14. In general, the organization you work for can recognize its weakness.			0.423		
15. Satisfaction with the operational level of the organization.			0.414		0.683
16. All departments exploit their own resources sufficiently.			0.782		
17. The accounting office knows how much the organization spends on each process.				0.549	
18. The organization has satisfactorily reduced its costs.				0.535	
19. The organization has the potential to improve its procedures.				0.835	
Eigenvalues	5.197	2.156	1.631	1.385	1.138
Percentage of variance explained	30.573	12.682	9.596	8.147	6.695

Source: Calculated using data from questionnaires distributed to external and internal accounting departments of educational institutes in Greece.

Table 2 Reliability test ($N=152$)

Factors	Number of items	Cronbach's alpha
Cost allocation capability - CAC	8	0.85
Internal cost information transmission - ICIT	4	0.71
Operational competitiveness of the organization - OCO	4	0.78
Cost management improvement margin - CMIM	3	0.72
	All items	0.82

Source: Calculated using data from questionnaires distributed to external and internal accounting departments of educational institutes in Greece.

The first eight variables are attributable to the first factor and appear to relate to institutes' present cost allocation capability (CAC), that is, ability to estimate the costs of services offered and classify the data to be utilized for strategic decisions. The second factor, internal cost information transmission (ICIT), included four variables, all of which seem to refer to institutes' ability to inform their employees, understand the trends of changes, accept new methods, and transmit information to the management.

The third factor, operational competitiveness of the organization (OCO), contains four variables. All four variables address institutes' respective positions in the education sector and their willingness to maintain or increase competitive advantage, which in turn influences the implementation of new cost methods.

The last factor, cost management improvement margin (CMIM) consists of three variables and indicates (1) the ability to improve or implement cost data methods, (2) the difficulty of applying innovative methods due to lack of support from staff, and (3) the existing data collected by the costing methods used.

This study is an effort to understand whether an institute is either eager to adopt ABC or faces big obstacles. We choose to use these four factors because they reflect the existing costing procedures, allow or obstruct the transmission of information between departments, exert pressure for operational improvement towards competitive edge, and improve or deteriorate organizational cost management.

Four hierarchical regression models were estimated using the four factors identified by PCA as the dependent variables. The three general questions are first incorporated into a hierarchical regression model to control the explanatory variables representing strengths and weaknesses. Table 3 indicates that from a total of 31 independent variables, 13 explain the OCO factor, 11 the CAC factor, 10 the MICA factor, and six the ICIT factor.

Information on cost per student, provided by the existing accounting system, is the most important factor in determining the ability to adopt ABC. The variable was found to be statistically significant for all four factors. Information on cost of services, quick decisions, usefulness of the exact sum of cost per student, and reducing overheads had significant impacts on CAC, OCO, and MICA, but not on ICIT.

Table 3 Results of hierarchical regression analysis

		Dependent:			
		CAC	ICIT	OCO	MICA
Information from the existing accounting system:	Cost of services	*	-	*	*
	Cost of classes per year	*	*	-	-
	Cost per student	*	*	*	*
	The cost per hour of class	-	-	*	-
	Cost related functions	-	-	-	-
Use of cost information can improve service quality related to:	Quick decision-making	*	-	*	*
	Good decision-making	-	-	-	*
	Internal audit	-	-	-	-
	Rating of separate classes	-	*	-	-
Usefulness of the exact sum of costs by:	Class (year)	*	-	-	*
	Student	*	-	*	*
	Teaching hours	-	-	-	-
	Classroom	-	-	-	-
Possible drawbacks of the hypothetical application of cost analysis in the existing system:	Data analysis difficulties	-	-	-	-
	Reservations/reactions in data collection	-	*	-	*
	Increased costs	-	-	*	-
	Reservations/reactions to learning the new system	-	-	-	-
Potential advantages of the future application of a different accounting system:	Identify costly activities	-	*	*	-
	More precise allocation of overheads to services	-	-	-	-
	Cost effective management	-	-	-	-
	Improve the budget process	-	-	-	-
Processes that can be supported by the current accounting system:	Redesign existing services and/or new services development	-	-	-	-
	Maintaining and/or improving the quality of some activities	-	-	*	-
	Cost control	-	-	*	-
	Reducing overheads	*	-	*	*
Issues:	The collection of primary data for costing is problematic	-	-	*	-
	The indirect cost sharing criteria are not suitable	*	*	*	-
	Cost is not allocated properly to the services	*	-	*	-
	Cost information received late	*	-	-	*
	The accounting system does not provide the actual cost	*	-	-	*
R ²		0,67	0,46	0,62	0,52

($N = 152$), Significance at 5% level. CAC = Cost allocation capability. ICIT = Internal cost information transmission. OCO = Operational competitiveness of the organization. CMIM = Cost management improvement margin. Source: Calculated using data from questionnaires distributed to external and internal accounting departments of educational institutes in Greece.

Among the issues in the existing accounting system, the unsuitability of the criteria allocating indirect costs was found to be most important. It was significant for CAC, ICIT, and OCO. The findings indicate that the largest number of significant explanatory variables for the four factors was related to the information provided and the various issues that could interfere with the transmission of information.

Policy Implications

For higher education, ABC could prove rewarding in the field of science and technology due to difficulty in covering the increased costs and high interest rates (James 1991). Improved cost allocation would ensure cost savings and thus attract better funding. The ABC method enhances pricing and wage policies, thus improving the quality of services.

Private education in Greece suffers from a lack of state funding, high completion rates, and high tuition fees. ABC minimizes cost and indirectly reduces tuitions. In the future, the reform of higher educational institutes will require more complex data to cope with the sector's dynamic environment (Livanos 2010).

In regards to public education, the public education cost system of the MERA is retroactive, and as such, fails to effectively calculate the impact of high expenses. Educational institutes in Greece should reform their cost management system according to the EU's suggestions on detailed cost data (Eurydice Network 2009). This study encourages the application of ABC as a means for better cost logging and reduction of costs, without resorting to conservative methods. As sophisticated costing methods are considered necessary for the development of an educational institute, regardless of its competitive position or location, the need for ABC in Greece is noteworthy.

Conclusions

This paper examines Greece's education sector and the factors affecting the implementation of ABC. Similar cases in the literature rarely include detailed information on ABC as a means for profitability augmentation. However, the method's application depends on the organization's eagerness to acquire necessary cost data.

This study indicates that the education sector lacks data that can help minimize overhead costs and thus requires more accurate cost analysis. Specifically, most institutes are unable to choose suitable criteria for determining overhead costs while there is a delay in receiving cost information. Moreover, institutes exhibit difficulties in accurately allocating costs and are not fully aware of the importance of ABC as a decision making tool.

The majority of institutes familiar with ABC appreciate its benefits but refrain from applying it. They are troubled by the method's complexity, the lack of trained personnel, and the general expenses involved. However, with basic personnel briefings and the promotion of information sharing between departments, implementation of ABC is possible.

Suggestions for Future Research and Study Limitations

Because the present study was based on questionnaires, the structured answers indirectly constrained the explanatory information received and restricted respondents from sharing further information. For future research, combined methods should be used. The sample used was limited due to the relatively low response rate. However, similar research indicates that response rates for management and accounting departments of educational institutes are usually lower (Pettersen and Solstad 2007).

The benefits of ABC usually outweigh the costs of data collection. The model is relatively easy to use or extend once it is set up (Goddard and Ooi 1998). In addition, due to their small size, Greece's educational institutes are expected to require fewer activity cost pools, which makes the model less complex, quicker to use, and not cost-prohibitive. As we are lacking the necessary funds for academic research and acquiring cost data, a cost-benefit analysis is beyond the scope of this study. However, a case study regarding the implementation of ABC in an educational institute is considered imperative.

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