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ACTIVITY-BASED COSTING IN CHARTER SCHOOLS: FACILITING SYSTEMIC REFORM THROUGH BETTER UNDERSTANDING OF RESOURCE USE

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By

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ABSTRACT

ACTIVITY-BASED COSTING IN CHARTER SCHOOLS: FACILITING SYSTEMIC REFORM THROUGH BETTER UNDERSTANDING OF RESOURCE USE

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America's schools do not understand the costs of the services they produce. Present financial reporting systems obscure meaningful information because costs are grouped according to traditional accounting categories rather than being assigned to services the school produces. This poses a barrier to effective management of resources and thus to improving student outcomes.

This study developed and implemented an Activity-Based Costing analysis at a charter school. The project provided school leaders with a cost analysis that related costs directly to what the school produced, and the specific activities that produced the school's services. Through multiple interviews, observations, and surveys a costing structure was designed and built using the Activity-Based Costing method, and the charter school's costs for a fiscal year were analyzed in that format.

Various cost reports were presented to the charter school's leadership including reports for the school as a whole and reports focusing on the costs of particular components of the school.

The total cost of delivering a year of instruction was presented with traceability to exactly what was consumed to produce that year of instruction. Specifics such as how much teacher time and its cost were spent on instruction versus planning, parental engagement, or any other activities are clearly identifiable. Numerous reports focused on specific school activities and services were presented, such as the incremental cost to educate students with special needs; costs on these reports are also clearly identifiable and traceable to who performs the activities and the cost of those activities.

These Activity-Based Costing reports provided meaningful insights to this school's leadership; upon review of the Activity-Based Costing reports, leadership determined that several structural elements of the school should be reviewed to improve school effectiveness.

Suggestions for further research are proposed, including longitudinal studies to evaluate benefits produced over time by the Activity-Based Costing information, implementation at other charter schools to determine if similar benefits are attained, and making Activity-Based Costing part of ongoing monthly management reporting. The potential value of Activity-Based Costing data in arguments for changes to state funding or as support for grants is also proposed.

Chapter 1: Introduction

"Linking top-down standards-based reform and bottom-up school finance reform has the potential to affect American education well into the future." (Verstegen & Driscoll, 2008, p. 332).

America's public schools face an increasingly challenging landscape. Student populations become more diverse each year, requiring elevated effort and funds to address that diversity and provide quality education. At the same time, funding sources are constrained – particularly in the present economic environment. Schools are expected to do more with less.

Mandates such as No Child Left Behind (NCLB) increase pressures for public school accountability. But, like predecessor mandates such as Title I, the funding provided with NCLB does not provide adequate resources to meet its benchmarks.

Present public school financial reporting systems do not offer much opportunity to improve performance because they do not provide the information school leaders need to make sure funds are used as efficiently as possible. This stymies efforts to manage resources more effectively and maximize their benefit. For instance, traditional schools are provided teaching positions based on enrollment. But the true dollar cost of each teacher – clear reporting of the differential between experienced versus new teachers' pay, for instance – is not reported at the school level. Furthermore, various operational constraints, such as union contractual requirements, limit decision-making flexibility by school principals at a traditional public school.

Many argue that, to stay competitive, America's schools must be reformed. Yet, the confluence of inadequately funded mandates, opaque financial information, and

constrained decision-making at the school level make meaningful reform difficult, if not impossible. Many times principals understandingly throw up their hands in exasperation and submission to a situation they feel powerless to change.

The advent of charter schools, and their autonomous nature, is changing some of this picture. Unlike their traditional school counterparts, charter schools' reporting systems provide somewhat better clarity of resource use but that advantage is marginal. And while charter schools still face many of the same mandates traditional schools face, charter schools possess more autonomy in budgetary decision-making and resource allocation than their traditional counterparts.

Over the years, the public sector, including public education, has "borrowed" ideas and methods from the for-profit sector. Leadership techniques and financial systems with proven track records in the business world have been transferred to the public sector with positive outcomes. For instance, Indianapolis is well-known for achieving cost efficiencies by outsourcing intelligently when it is cheaper to do so using improved cost information provided by an Activity-Based Costing methodology (Mullins & Zorn, 1999).

As for-profit entities' structures have changed and their complexity has increased, effectiveness of old methodologies of accounting for costs and resource usage decreased. One example of this increased complexity is flexible manufacturing. Years ago, a typical production facility would make one product, or a few similar products, but modern production facilities commonly make multiple dissimilar products; understanding the dissimilar costs of these products requires new reporting systems.

Activity-Based Costing is a cost accounting method developed in the for-profit sector, and subsequently used in some public sector entities, that seeks to provide management with clearer information regarding resource consumption (Hicks, 2005). Examples of public sector entities that have successfully utilized Activity-Based Costing include federal agencies (Evans & Bellamy, 1995), cities (Meyer, 1998), public employment and training programs (Moore, Gorman, & Wilson, 2007), and universities (McChlery, McKendrick, & Rolfe, 2007).

Activity-Based Costing assigns costs differently than traditional accounting systems, categorizing costs according to activities performed rather than general ledger account classifications such as payroll or building maintenance. For instance, using Activity-Based Costing, the category Certificated Salaries would be broken down into the activities those certificated personnel perform, such as instruction, planning, etc. This methodology determines what causes costs (cost drivers), and then uses those drivers to attach cost dollars to cost objects which, in turn, comprise the activities (Tardivo & Cordero Di Montezemolo, 2009). For example, the cost of maintaining student records might be driven by the number of new students entering a school or by the number of students making program changes.

The major feature distinguishing Activity-Based Costing from other cost accounting methods, therefore, is its focus on the entity's processes, the activities and other costs required to perform those processes, the clear connection of those processes to the entity's outputs and, ultimately, the build-up of financial results in accordance with those activities, processes, and outputs. The result is a clear depiction of the resources used to create the entity's outputs (Jipyo, 2009).

Activity-Based Costing has steadily gained acceptance as a tool for addressing the increased complexities of for-profit entities and meeting reporting needs in the face of structural changes that have occurred over the years. Although many public sector entities, including those mentioned previously, have implemented Activity-Based Costing and attained beneficial results as well, Activity-Based Costing has not yet been studied or implemented in America's K-12 schools.

The flexibility and more "businesslike" manner in which charter schools are managed compared to traditional schools makes them a good testing ground for Activity-Based Costing. Because charter schools have more fiscal and operational autonomy than their traditional school counterparts, they have the flexibility to utilize Activity-Based Costing in search of efficiencies. If efficiencies can be found, then the potential exists to improve charter school effectiveness even without an increase in funding resources. A principal would have the information necessary to make better-informed "trade-off" decisions between field trips and collaborative planning, for instance, because of better understanding of the true costs and benefits of each.

Put another way, through better clarity regarding consumption of resources, managerial decisions could be changed to improve student learning outcomes at any given level of funding – without a change in that overall funding level. Better information could assist principals, school boards, and other managers to improve the use of existing resources, ultimately freeing up funds for more textbooks, technology, supplies, and teacher training (these things have been shown to have positive impact on student learning outcomes).

Problem Statement

Schools do not know the cost of the services they produce. Present financial reporting systems obscure meaningful management information due to the manner in which costs are grouped, as well as the large size of the groupings; one grouping can include many diverse operational elements. Specifically, approximately 80 to 90 percent of resources are grouped into salaries and benefits. But the breakdown of these expenses in conventional accounting groupings by employee category does not clearly depict the costs of the functions or activities performed by the employee groups contained in it. This lack of understanding hinders good management and poses a barrier to improving the learning environment and student outcomes, retarding progress toward improved student achievement.

A better understanding of what a school's services and outputs cost and how resources are consumed in their production is needed so schools can make better managerial decisions. For example, the present budget category for teachers' salaries does not separate those salaries by output service category such as instruction, student test scores, or various non-instructional activities. Because of this and other similar reporting obscurities, there is no capacity to determine how much it costs to take a field trip or operate a computer lab, for instance, nor is there a measure of the benefits produced by each. If meaningful categories such as these were created and maintained, and each included the cost of inputs consumed and the benefits provided, a new deeper managerial understanding could be used to make decisions to improve the effectiveness of resources consumed.

Charter schools possess the managerial and financial flexibility to make meaningful changes in resource use but lack the information to do so. Activity-Based Costing is needed to assist school leaders' understanding of costs so they can move resources to where they will have the most beneficial impact.

Purpose and Significance

The purpose of this study is to determine if an Activity-Based Costing methodology can be applied to reveal the accurate costs of processes and outcomes at a charter elementary school and provide insights to improve school performance. Better understanding of resource use could provide insights into more efficient use of existing resources and, in turn, lead to improved student outcomes and achievement.

Activity-Based Costing is a completely different manner of accumulating and understanding costs that connects use of those resources directly to service outputs. It is more than just an analysis, it is a management tool that shows what it costs to produce different services by looking at how people use their time and resources, and what that time costs so it can be understood and managed more effectively. It is that increased effectiveness that has potential to free-up resources, enabling schools to do more with the same level of funding.

Building an Activity-Based Costing financial reporting system works in a backward manner from outputs to inputs, first identifying the outputs or services an entity produces and then tracing them to the inputs used to produce them. Currently, school leaders do not think in terms of outputs or processes, so this represents a reconceptualization of how their school works. This is because the school leaders themselves must define the outputs and other components of the Activity-Based Costing

methodology; it is not an imposed model. Potential school outputs might include graduation rates, student test scores, or other student performance measurements. Upon identifying the outputs, the processes that support them are identified. Examples of school processes might include instruction, parental contact, extracurricular activities, etc.

Once the processes supporting the outcomes are delineated, the activities that comprise the processes are identified. These activities are the foundation – the basic building blocks – to which costs are attached. So, a teacher might identify that two hours in a particular day were spent on direct instruction (a process) and, of that direct instruction, some was a group activity and some was stand-and-deliver. The teacher's cost (salary and benefits costs) can be assigned to that time, and then those activities can be accumulated into their respective processes. In this manner, a summation of the cost of each process can be accumulated and those processes' costs can be, in turn, assigned to their outputs, resulting in an accurate and meaningful total cost figure for each output.

Connection of inputs to outputs presents a clearer financial picture to management, enabling better-informed decisions regarding allocation of resources in pursuit of improved student outcomes. Activity-Based Costing can illuminate and categorize the activities various school employees (teachers, staff, and administrators) perform into groupings that are meaningful and, therefore, more useful to school leaders because the school leaders defined those categories and their inputs.

Compared to their traditional school counterparts, charter schools enjoy relative autonomy regarding resource use (Buckley & Fisler, 2002); this is the reason for selecting a charter school versus a traditional school for this study. Furthermore, unlike

traditional schools, charter schools possess more school-level information regarding their funding inflows and how those funds are consumed (Geske, Davis, & Hingle, 1997). These two differentiating attributes of charter schools versus traditional schools provide the building blocks for design and implementation of an Activity-Based Costing costing model, and a venue in which the resulting information can be used to facilitate systemic reform.

Examples of Activity-Based Costing's potential exist in other public service sectors. For instance, The Defense Logistics Agency in Washington, D.C. achieved a greater accountability and significant cost savings by using the Activity-Based Costing methodology, demonstrating efficacy of Activity-Based Costing in the government service sector (Harr & Godfrey, 1992). In England, the Crown Prosecution Service implemented Activity-Based Costing and achieved improved accountability for its costs, 85 percent of which were salaries, similar to schools (Liu, 2005). This improved accountability and clarity of resource use enabled more effective distribution of the Service's existing lawyers across its three branches, and facilitated redirecting some work to lower-level paralegals, improving output with the same personnel (Liu).

Research Questions

1. Can an Activity-Based Costing analysis of a charter elementary school:
    a. Identify measurable services produced by the school?
    b. Identify the activities and processes that produce those services?
    c. Trace the costs of the activities and processes to accurately estimate the costs of services produced?

2. Can an Activity-Based Costing analysis provide insight that will lead to more efficient allocation of resources to support student achievement?

Overview of Methodology

This study used an action research approach to determine if the Activity-Based Costing method of cost analysis could be applied to an independent charter school to generate useful insights into how the school's resources could be used more efficiently to improve student achievement. I actually conducted an Activity-Based Costing analysis of the school's previous fiscal year 2009-10, and then debriefed the results with school leadership to evaluate its usefulness and value. This was, in essence, a case study of applying the Activity-Based Costing method to a charter elementary school.

The objective was to develop Activity-Based cost categories outside the traditional budget categories that would be more meaningful and useful to school leaders. Present systems follow funding streams and accumulate costs by traditional major categories such as salaries and benefits; and salaries and benefits alone comprise over three quarters of a typical school budget but are not broken down into categories that could help school leaders understand their operations better; for example leaders don't know what activities those employees spend time on, or how their activities contribute to student achievement at the school.

Rebuilding the schools' budget from the bottom up using more meaningful activity categories defined by school leadership, then linking these activities to specific school outputs, provides a unique and potentially more valuable tool for decision-making and improving those outputs (e.g., student test scores or other measurements). A simplified example of this is shown in the following exhibit; on the left is a traditional

budget reporting format according to account classification, on the right is a sample activity-based report.

Figure 1.1

Comparison of Traditional Accounts to Activity-Based Costing

Traditional Line Item Budget View	
Salaries	$ 185,000
Benefits	35,000
Supplies	58,000
Utilities and telephone	14,000
Continuing education	23,000
Total	$ 315,000

Activity-Based Costing View	
Individual instruction	$ 106,000
Individual preparation	91,000
Collaborative instruction	44,000
Parental communication	39,000
Administrative	35,000
Total	$ 315,000

This study has six phases:

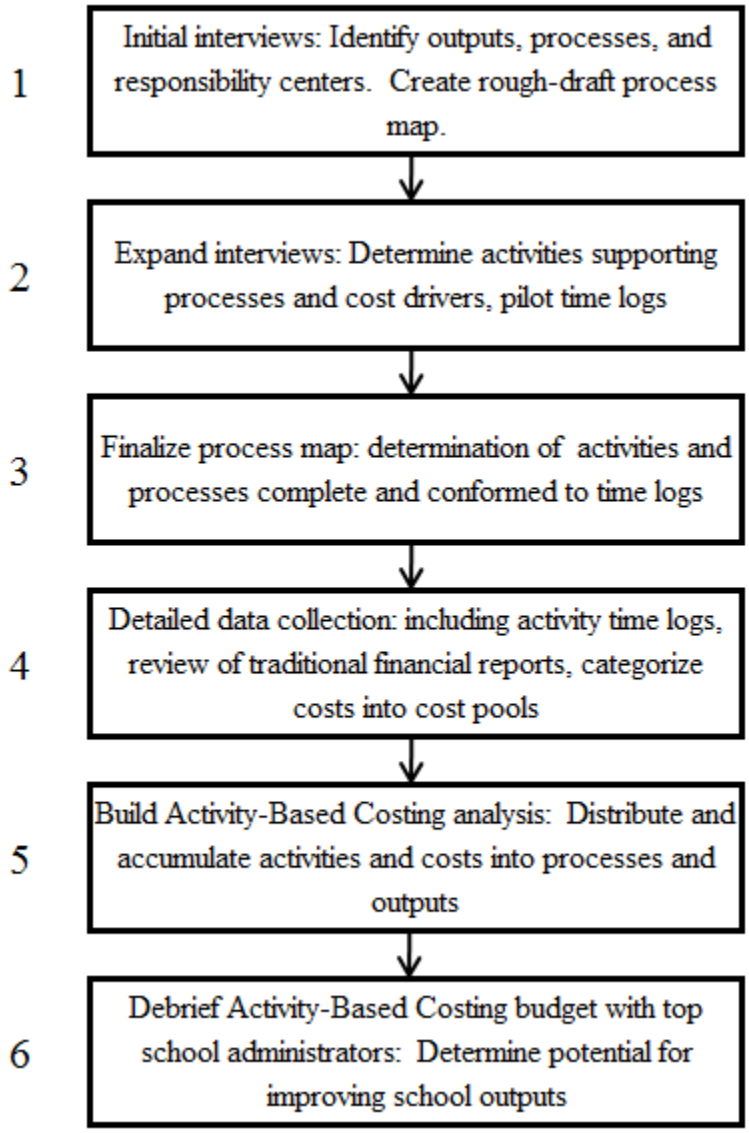
1. Identify the school's outputs and major processes leading to them, the individuals contributing to the processes, and the responsibility centers through interviews with top school administrators; create rough-draft process map.
2. Identify specific activities that make up the processes defined in phase one, determine what causes those activities; expand and refine process maps through further interviews and observations; pilot time logs from a small, judgmentally selected sample of teachers.
3. Finalize activities; organize them into final processes and process map through final interviews with administrators; finalize and harmonize the teacher and administrator time logs with the process map.

4. Obtain completed time logs from all teachers and top administrators, indicating how they use their time in accordance with the activities and outputs determined in previous phases. Obtain the school's most recent fiscal year financial data and categorize its contents into the identified cost pools. Obtain volunteer time logs and board of directors' time; assign values to that time and categorize results into the identified cost pools.
5. Calculate the costs of the school's outputs; build the Activity-Based Costing analysis; distribute dollar amounts from cost pools to activities, summarize the activities into outputs, yielding costs for activities and each process output.
6. Analyze and assess results with school administrators to determine potential for redirecting existing school resources to more efficient/effective uses.

Below is a flowchart of these basic steps. They are described more fully in the following paragraphs, and detailed completely in the methodology section of this paper.

Figure 1.2

Overview of Project's Phases



Phase One – Identify Outputs, Processes, and Responsibility Centers; Create Rough-Draft Process Maps. In this phase I identified the school's outputs, processes, and responsibility centers through interviews with top administrators, and determined the individuals/positions that contribute to the processes. For example, if top administration identified student achievement as an output, then a process leading to student

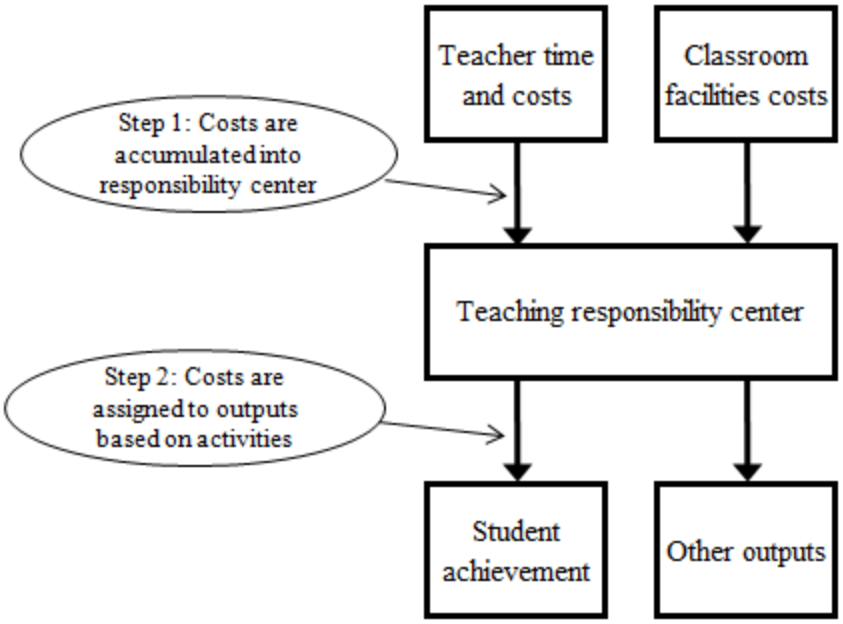
achievement could be defined, with the objective of determining who and what the major contributors to that process are – such as direct instruction by teachers and tutoring by aides. Restated, this phase began to determine the overall structure within which costs would be accumulated and assigned using the Activity-Based Costing analysis.

Responsibility centers were also identified. As part of a two-step cost accumulation process, these are the "pools" into which costs were placed for subsequent assignment out to processes based on activities. Examples of responsibility centers include teaching, administration, and the school's library. The purpose of the responsibility centers was to collect costs for assignment to activities and their respective processes. For example, the school library was an identifiable organizational unit and a measurable set of resources, including the librarians and support costs, that could be captured and assigned to activities; so it was a responsibility center. Teaching was another identifiable responsibility center because it was also an identifiable organizational unit with measurable resources (teacher time, classroom aides, classroom facilities, etc.).

The simplified example below depicts this fundamental process for sample activities, a responsibility center, and outputs:

Figure 1.3

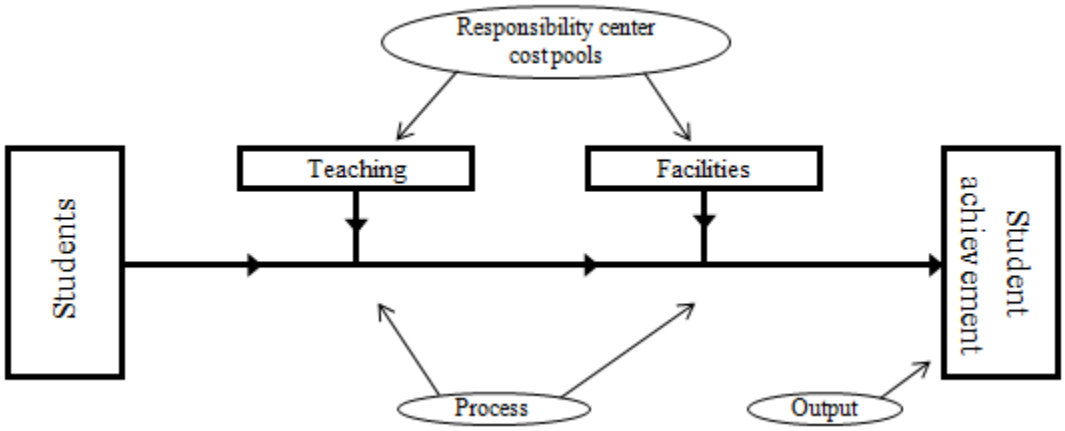
Simplified Activity-Based Costing Analysis



Phase Two – Identify Activities and Cost Drivers in Processes, Refine Process Map and Develop Time Logs. In this phase I obtained further detail of the processes identified in phase one through continuing interviews and also teaching observations; identifying the activities that contributed to the processes through expanded interviews with the individuals/positions identified in phase one; and determined in more detail what causes those activities to occur, refining the process map begun in phase 1. Continuing with the student achievement example introduced above, the process leading to that output might include several activities such as direct instruction, tutoring, special education, etc.; and furthermore several personnel might be identified as contributing to that process such as teachers, classroom aides, parent volunteers, etc. The activity driver might be the time spent teaching.

Figure 1.4

Sample Process Map for Student Achievement



In this phase, time logs were also developed for completion by the school's teachers and administrators. These time logs would be used later to assign costs to activities and processes.

Phase Three – Finalize Process Map and Activities. In this phase I fine-tuned the process maps, including the activities and their drivers, using detailed data collection consisting of further interviews, observations, and pilot time logs. (It should be noted that the main cost driver for people is how they spend their time and, because salaries comprise the majority of a school budget, determining the way employees spend their time through time logs is a large and important component of this phase.)

Data collected through these various means was triangulated and harmonized in an iterative fashion by comparison and ongoing discussions with the individuals involved until substantial agreement and alignment was attained regarding complete details of outputs, processes, and individuals/positions and their activities included in those

processes. This enabled creation of a final, complete, detailed process map for each output.

Phase Four – Detailed Data Collection. Detailed data collection entailed determining how teachers and administrators spent their time (using the time logs as the source) and accumulating the dollar costs of the school's most recent closed fiscal year.

I obtained completed time logs from all teachers and top administrators at the school to determine how they spent their time in a typical week and developed averages of how each of these groups spent their time. This time usage data was utilized in phase five to apportion dollar costs from the teaching and administrative cost centers to activities within the processes.

I also obtained the 2009-2010 year traditional financial reports and accumulated the dollar costs into the responsibility center costs pools. In addition, I added assigned values for the school's volunteers (e.g., parents). This resulted in dollar totals for costs according to responsibility (e.g., teaching, administrative) that were assigned to activities and processes in phase five.

Restated, in phase four the dollar costs were accumulated (primarily from the financial records), and the detail for assigning those dollar costs was also accumulated (primarily the results of time usage determined by the time logs). This set the stage for building the activity based costing analysis as described in phase five.

Phase Five – Build Activity-Based Costing Analysis; Determine Costs of Processes. In this phase I assigned costs to the processes (e.g., student achievement) and built the Activity-Based Costing analysis, accumulating dollar amounts into the activities and, in turn, activities into their respective processes to get the cost of each process.

Teaching and administrative costs were assigned to activities and processes in accordance with the results of their respective time logs, and other support costs were assigned using various applicable methods (e.g., square footage for facilities costs).

The total costs of the processes were agreed to the total costs shown in the traditional financial reports (plus the values assigned to volunteers), but the Activity-Based Costing total showed breakdowns of that total according to processes and the activities within those processes, clearly identifiable and connected to input activities including who performed them, what facilities were utilized, etc.

Phase Six – Assess Activity-Based Costing Analysis' Value for Decision-Making. In this phase assessed the Activity-Based Costing analysis' value for providing valuable insights toward managerial decision-making through discussions with the school's leaders. The results of the Activity-Based Costing analysis were shared with top administrators of the charter school, and their assessments regarding its usefulness as a management tool were obtained. Specifically, in a series of follow-up meetings, school leaders were asked to review the Activity-Based Costing output and evaluate to what degree it provided useful information that could facilitate decisions for improving school outputs (such as student achievement). For instance, teachers' time might be redirected from activities supporting other processes to the student achievement process if school leaders deemed the other process or activities being performed within them as less important or less productive toward improving school outputs.

School leaders do this now; they think some things are worth their costs and others are not, but they make their decisions without the benefit of objective data to support those decisions. The school leader assessments regarding the new Activity-

Based Costing analysis' value are summarized and final conclusions are drawn regarding Activity-Based Costing's potential for improving outputs at a charter school.

Additional Considerations. It is also important to understand that a particular activity, such as direct instruction in the above example, might be performed by individuals from more than one employee category; it is even more important to realize that one individual likely performs multiple activities that are part of more than one process. For example, instruction (an activity) might be performed by teachers, classroom aides, or parent volunteers. And a classroom aide might perform instruction and also other activities that support other processes and outputs.

Limitations and Delimitations

The degree to which these results can be generalized to other charter elementary schools is unclear. Any particular charter elementary schools' location has a significant impact on its student population which, in turn, significantly impacts its activities, existing resource usage, and the resulting allocations. Furthermore, many charter schools are built upon a stated mission, and differing missions among them affect their profiles. Varying attributes such as these could cause materially different results at another charter school compared to the results obtained from the school studied for this project. But although the specific results of the Activity-Based Costing analysis at this elementary school may not generalize to others or represent an industry standard in its final structure, the analysis method itself may prove to be adaptable and applicable to other charter elementary schools.

Moreover, many very detailed-level decisions are necessary regarding the manner of delineating the building blocks for the school's Activity-Based Costing analysis, as

well as selection of processes and outputs, the order in which they occur, and the contents of each. During each phase of data collection, selection of categories to use is triangulated, corroborated, and harmonized among sources, but ultimately judgment comes into play in many of the decisions. These judgments impact findings. Choices of activity definitions and measures, process configurations, outputs identified, payroll and support cost factors, including the relative breadth of the categories determined, all impact the study's results. Different decisions in any of these areas would produce different outcomes.

Despite the iterative nature of the data collection process, potential for error in the final results and delineations remains despite triangulation of data from numerous sources, and the checking and rechecking of results and modifications with the individuals involved. For example, even minor errors in determining a teacher's time usage have potential to multiply and become significant, given the roll-forward nature of the Activity-Based Costing cost buildup.

Differing salary levels among teachers and the impact of their grade level on activities performed (e.g., a kindergarten versus middle school teacher) can also skew results. As described in the methodology, the researcher attempted to ameliorate this by normalizing salaries to percentages versus hours; nevertheless, potential for error remains in the resulting percentages used to apply teaching and associated costs, which represent a significant majority of the total costs assigned through the Activity-Based Costing methodology.

In addition, research has shown that entity cultures have significant impact on Activity-Based Costing results. The degree to which employees are amenable to or

accept Activity-Based Costing, and management's attitudes and capacities, affect the clarity and accuracy of the delineation of the building blocks as well as the manner in which they are rebuilt into the total Activity-Based Budget analysis' output.

Because the Activity-Based Costing model is developed based primarily on interviews of management, it is a perceived model of the school's processes and the components of those processes. There is no evidence that the perceived model is, in fact the actual model of the school's processes and outputs. Additionally, a fundamental assumption of the Activity-Based Costing model is that the inputs of what the school produces are separable, additive, and identifiable, and that those inputs can be meaningfully and accurately assembled into the school's outputs. It is also possible that additional outputs beyond those identified exist and, if those additional outputs were included in the model, the costs of other identified outputs would change. As stated earlier, this model is an approximation, based on management's vision of its school.

Summary

This project created a budget analysis for a charter elementary school delineated into categories that show the costs of key school outputs that are meaningful to school leaders. In fact, this school's leaders determined those categories based on what they saw as their school's primary outputs. In conjunction with multiple iterations of data collection, a flowchart called a "process map" was created to depict the inputs necessary to produce the outputs, and the activities supporting the processes were determined. Costs of those activities and other support costs such as facilities were calculated; the manner of assigning these costs to processes and, in turn, outputs was also determined. The activities and other costs were accumulated into responsibility centers and

subsequently assigned to their respective processes through the activities (including appropriate assignments of support costs). Those processes were then accumulated into outputs, creating an Activity-Based Costing analysis. School leaders were presented with this data and asked to assess its usefulness toward improving the school's outputs, providing the basis for the summary and conclusions reached in this paper.

This paper continues with a review of relevant literature on school finance and reporting deficiencies, and benefits that have been attained from implementing Activity-Based Costing thus far, including other public-sector venues. Then the methodology utilized in conducting this study is detailed including the school site, data collection methods, and analyses techniques. Last, the study's findings are detailed and conclusions drawn from those findings.

Chapter 2: Literature Review

This literature review is organized around several themes. First, I will explore the present situation in school financial reporting and information systems, highlighting their inefficiencies and opaque nature. Next, I will describe the need to better allocate resources, and explore the connection of resources to student achievement.

I will explain the history of Activity-Based Costing, its basic premise, and how it works. Then, I will show successful applications of Activity-Based Costing in public organizations such as municipalities and universities.

I will show how charter schools' relative autonomy compared to traditional schools presents opportunity for successful application of the Activity-Based Costing model.

Present Situation in School Finance

School Information Systems. Present-day financial reporting systems are inadequate and, as a result, policymakers are unable to understand how school activities drive performance; only overall resource levels are reflected and precision is lacking (Guthrie, 2007). Furthermore, the variety of funding sources fractures reporting as well, making it difficult for anyone to understand the big picture of where funds are used, or make intelligent decisions regarding more effective use of those funds (Hill, 2008). "There are many funding sources… …the sum of many different funding programs. The total can be computed, but… …the amounts we spend and the ways we spend them do not derive from analysis of what is needed and what it should cost" (Hill, p. 239). At the same time, educational reform is making it clear that better data is needed to meet the additional accountability requirements for student outcomes (Sanders, 2008). The

educational environment is becoming increasingly data-driven, and pressure is on educators to justify themselves with qualitative and quantitative data; but the present gaps in data are inhibiting their ability to do this (Sanders).

Verstegen & Driscoll (2008) write about the obsolete state of educational reporting and note the need for a reinvention of funding systems to better align them with the present information age, suggesting that reinvention needs to be systematic rather than additive. This has given rise to a new generation of research focusing on the adequacy of education finance systems (Verstegen & Driscoll). "Linking top-down standards-based reform and bottom-up school finance reform has the potential to affect American education well into the future" (Verstegen & Driscoll, p. 332).

New systems are beginning to emerge. For example, Tennessee has developed what it calls a Value-Added Assessment System Database that measures student academic growth longitudinally and uses that to evaluate school effectiveness (Sanders & Horn, 1998). Interestingly, this assessment system has shown that race and socioeconomic status are less effective determinants of student outcomes than teacher effectiveness, bolstering the argument that better information can positively impact managerial decisions and, hence, school effectiveness and student performance across all student populations (Sanders & Horn).

In California, there is a movement toward creating similar longitudinal systems, recognizing that it is essential that enrollment history and student outcomes be tracked over time (www.cde.ca.gov, 2010). Establishment of two databases, the California Longitudinal Pupil Achievement Data System (CALPADS), and the California Longitudinal Teacher Integrated Data Education System (CALTIDES), is seen as one

means of meeting the increasing thirst for data that is part of the State's effort to more effectively achieve academic standards (www.cde.ca.gov).

Most reforms, such as No Child Left Behind, focus on test score data (www2.ed.gov, 2010); little effort has gone into looking at the use of resources in new and different ways. "No legislative body or school board is responsible for deciding how much is needed to produce a given set of outcomes – say, to ensure that every nondisabled child will graduate from high school or every high school graduate can enter a 4-year college without taking remedial courses" (Hill, 2008, p. 239).

Resource Allocation and Student Achievement. The existing environment, in which government mandates such as Title 1 and No Child Left Behind (NCLB) are inadequately funded (Brown, 2007), points to a critical need for improved information to facilitate more effective use of existing resources. "The federal government funds fewer than half of districts' requests" (Brown, p. 141). Inconsistencies across and within districts and even at the school level have been revealed, and better information regarding allotments at all levels has the potential to ensure, for instance, that the poorest children receive their fair portion of existing resources (Brown).

There is considerable debate regarding whether more money can improve student achievement, however. Many researchers have attempted to positively connect changes in resource levels with changes in student outcomes, such as whether a specific increase in dollars spent would cause an improvement in student performance on standardized tests (Hedges, Laine, & Greenwald, 1994). There are those who argue blindly throwing money at the problem is not productive. Hanushek (1989) classified resource inputs and regressed them with outcomes, finding that only seven percent of the inputs were positive

and statistically significant. He concluded, “There is no strong or systemic relationship between school expenditures and student performance” (Hanushek, p. 47). However, in a later study, Costrell, Hanushek, & Loeb (2008) blame weaknesses in Hanushek’s measurement instruments, and point to using average minimum expenditures (e.g., district-level) as a serious design problem stating, “Educational excellence requires a system with the knowledge, professional capacity, incentives, and accountability that will lead schools to determine how to spend their funds most effectively to raise student achievements” (Costrell et al., p. 222).

Other authors agree with this assessment. In his finding that educational resources are positively correlated with student achievement, Archibald (2006) concluded education reporting systems must develop the capacity to disaggregate expenditures into categories that will be more meaningful and connected to student achievement, facilitating redirection of scarce resources to where they will do the most good. Further, Hedges et al. (1994) replicated Hanushek’s original 1989 study in which he found insignificance, merely modifying the analytical methods used, and found a significant relationship between the same resource inputs and outputs; but these authors nevertheless also agree that “throwing money at schools” (Hedges et al., p. 13) is not the answer.

In Reno, Nevada, a system called InSite was developed to separate expenditures into the four categories of instruction, instructional support, leadership, and operations and maintenance; two of the categories, instruction and instructional support were found to have a significant positive correlation to student achievement (Archibald, 2006). Although Archibald’s work is instructive because it categorized expenditures, an Activity-Based Costing analysis is a considerably more detailed and sophisticated model.

A statistical study using three national databases lends further support to positive impact resources have on student outcomes. Human, social, and physical capital were found to account for a majority of achievement variation among fourth and eighth graders in English and mathematics (Crampton, 2009).

Another similar study on resource effectiveness was performed in which personnel and materials were found to be a significant predictor, together with environmental factors, of two thirds of variance in student outcomes (Greene, Huerta, & Richards, 2007). The personnel and materials component, which Greene et al. defined as "real resources" was found to improve the college aspirations of high school students by 14 percent. Springer, Houck, Ceperley, & Hange (2007) examined resource allocation in smaller learning communities and found that innovative ways of combining revenues from various sources can also facilitate reform. Specifically, in the three high schools studied, implementation of smaller learning communities was determined to be improved by reorganizing categorization of revenues received and connecting those revenues to specific expenditures in those startup smaller learning communities; the schools were able to minimize costs to support their structural changes through effective reallocation of existing funding (Springer et al.).

Hill (2008) asserts that funding is driven by political pressures, not intelligent reasons, and also corroborates other authors' assertions that present financial reporting systems provide insufficient data for decision-makers. More careful attention to how money is distributed among programs, teachers, and schools would improve effectiveness if spending could be redirected based on analyses of what produces the biggest results (Hill).

Another group of researchers studied resource allocation at the school level of eleven elementary schools in four states, assigning resources in keeping with educational strategies, and measured student improvement connected with those strategies (Odden, Goertz, Goetz, Archibald, Gross, Weiss, & Mangan, 2008). The manner in which dollar resources were used at some schools was found to be more effective than at others, and it was the delineation of the various uses of funds that enabled the authors to determine this relative effectiveness (Odden et al.).

Sanders (2008) also acknowledges the increasing importance of meaningful data to successful systemic reform in education, and stressed that data usefulness depends on proper collection and management of that data. Verstegen & Driscoll (2008) found that linking the standards-based reform together with school finance reform has the potential to make a meaningful positive impact on educational output, stating, "To align resources with curriculum and performance standards, funding systems need to be reinvented" (Verstegen & Driscoll, p. 332).

Activity-Based Costing – a Description of the Elements and Process.

Activity-Based Costing helps managers understand how they use their resources so they can improve the effectiveness and efficiency of their organization; the organization's leaders identify the outputs critical to their mission, and Activity-Based Costing realigns the resources and associated costs consumed according to those outputs. Sarkis, Meade, & Presley (2006, p. 757) describe Activity-Based Costing as "a cost accounting methodology used to allocate costs across activities of an organization's processes, and then accrue those costs based on services produced by an entity. It can also be used to help evaluate performance of activities and cost objects."

Activity-Based Costing entails a variety of specific terms. To assist in understanding Activity-Based Costing, those fundamental terms are described below (note that these terms are also connected together more completely in the methodology section following this literature review):

- Resources (inputs): The basic elements within an organization that are consumed in the production of its services – in a manufacturing environment these "resources" include the things that comprise the product such as materials and labor (Sarkis et al., 2006). For a school, they would include teacher time, other personnel time, facilities, etc.
- Activity: The most basic building block in the construction of an Activity-Based Costing model is an activity. An activity is an event that causes the consumption of resources (Brewer, Garrison, & Noreen, 2010) and, when viewed in the sequences in which they are performed, activities represent the basic actions that can be connected together to form a process (Sarkis et al., 2006). Potential activities in a school would include direct instruction, counseling, parental communication, etc.
- Activity measure: One unit of an activity is an "activity measure" and expresses how much of an activity is performed; these measures are the basic units of the activity used to accumulate them into activity cost pools, and then assign them out to processes (Brewer et al., 2010). A likely activity measure in a school would be an hour of a teacher's time.
- Activity cost pool: An activity cost pool is a collection of costs pertaining to a particular related set of activities; it is the "bucket" into which costs relating to

a particular activity or closely related set of activities is accumulated (Brewer et al., 2010), and from which costs will be assigned to processes performed by the organization. In a school, a cost pool might be teaching costs, counseling costs, the school library, etc.

- Cost drivers: Cost drivers are the elements that have a direct bearing to causing costs (Kinney & Raiborn, 2009); they are the factors that determine the level of costs in a particular activity or process (e.g., more of a driver causes higher costs); in a manufacturing environment more production (the driver) would increase electricity costs, for instance (Sarkis et al., 2006). In a school, potential cost drivers could be number of students, number of field trips, etc.
- Process: A process is comprised of activities and any given entity (such as a manufacturing plant or a school) will have several. A process is a connected series of activities performed to create an output (Kinney & Raiborn, 2009); a process can also be thought of as a path through a set of activities (Euske, Frause, Peck, Rosenstiel, & Schreck, 1998) that leads to an output. An example of a school process might be its API Test scores process – a collection of activities such as direct instruction and more leading to an output.
- Cost objects (outputs): Cost objects are any product or service of an organization for which cost accumulations is desired – this is highly dependent upon the organization – in a manufacturing environment a typical object would be one unit of output (Sarkis et al., 2006). In the context of a

service industry (e.g., school), those outputs are the results of services (service outputs); examples in a school might include the cost of graduating a student or a measure of performance improvement on API Tests. (Outputs are defined by the entity based on its mission and strategy as outlined in the methodology section, below.)

- Activity analysis: An activity analysis is the process of studying an organization's activities for the purpose of categorizing them and also to determine which are not adding value to the organization's purpose (Kinney & Raiborn, 2009). This study performs this analysis through a series of interviews, observations, and other data collection instruments and techniques.
- Process map: A process map is a graphic representation – a detailed flowchart that depicts how activities are connected into processes and how processes, in turn, are connected to creating outputs (Kinney & Raiborn, 2009); activities are combined together in a meaningful way to form processes (Euske et al., 1998). A school might have a process consisting of various activities and other inputs identified as producing student achievement output.

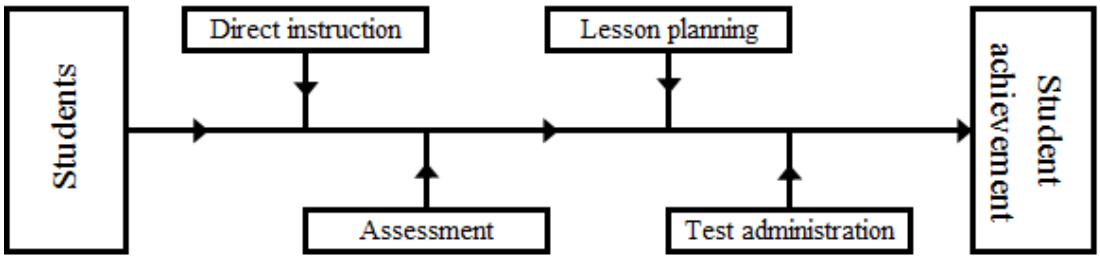
To summarize, resources (that cost money) such as teacher time or facilities usage, are consumed in the performance of activities (e.g., direct instruction). The resource use caused by these activities, in turn, drives costs (Kinney & Raiborn, 2009). Activities are the building blocks that are connected together in performance of processes (one process is comprised of several activities), and processes are the paths that ultimately lead to outputs (service outputs, in the case of a school or other service-providing entity). Activities are assigned to processes utilizing units of the activity

measure (e.g., how many hours of direct instruction are consumed in the process leading to improving performance on standardized tests).

Following is a simplified example of a process map, showing how activities are connected to a process leading to an output:

Figure 2.1

Simple Process Map for Student Achievement Process

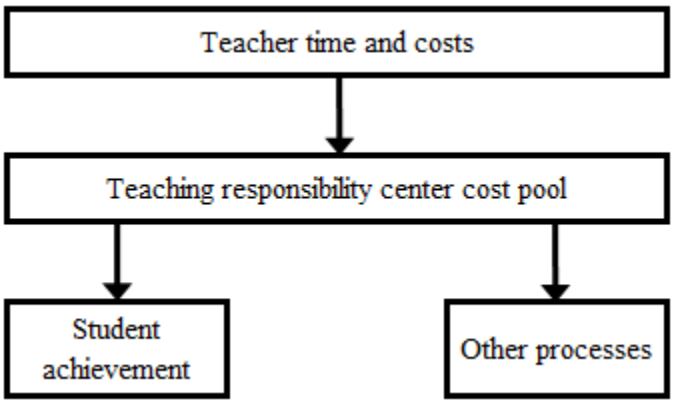


In the above example of a process map for API test scores, the activities (Direct instruction, Lesson planning, Assessment, and Test administration) are connected in a process leading to the service output (Student achievement).

Following is an example of the use of cost pools to accumulate activities and other costs and then assign them to processes:

Figure 2.2

Sample Activity into and out of Cost Pool



In the above simplified example for the teaching responsibility center cost pool, all teacher costs are accumulated into the teaching responsibility center cost pool and then assigned to processes based on how many teaching hours are spent on each process. Teacher time in hours is the activity measure and the number of hours spent is the cost driver used to assign teaching costs to the processes supported by those teaching hours. Note that all teachers' time (and costs) would be placed into the teaching responsibility center cost pool, and then those costs would be assigned out of that pool (based on number of hours) to the variety of processes identified as leading to various outputs (cost objects). The result is a financial depiction of product or service costs, showing the resources consumed to make them, delineated by processes and activities, making clear exactly what is consumed by each process and output.

(Figures 1.1 and 1.2 and the related description are solely to illustrate the definitions; more detail on the activities, processes, and service outputs of the subject school for this analysis is presented in the Methodology section of this paper.)

A major shortfall of traditional accounting cost reporting systems is that they rely on existing chart of accounts categories (e.g., certificated salaries) rather than delineating costs according to the activities performed by those salaried individuals; this presents a barrier to understanding actual resource use and, in turn, assessment of efficiency and quality, because the resource usage is associated with the accounting categories rather than with particular processes or outputs (Narong, 2009). Because of this, school leaders do not know what it costs to create critical outputs they care about. For instance, how many principals know the cost of remediating a student with a low API Test score in mathematics?

In the 1980s, managers began to realize that the traditional costing methods were not adequate and warnings about making decisions based on the old costing models began to emerge (Hicks, 2005). Decisions were rendered ineffective because economic information was distorted by the more traditional models (Hicks). Costs were shifted and assigned incorrectly under the old systems because those systems were designed when companies typically made only one or a very few similar products at any given facility (Brewer et al., 2010).

The older costing systems used one or very few cost pools to capture and then assign costs, and that worked when companies were less complex in their operations. Modern-day enterprises are far less homogeneous in their outputs than in years gone by, making a variety of products at one facility; and as a result many disparate factors can drive costs (Brewer et al., 2010).

Because traditional costing models do not connect costs clearly to activities in these more complex situations, Activity-Based Costing has become known as an innovative manner of understanding how costs that had been accumulated in the traditional accounting categories are really shared among outputs (Tardivo & Cordero Di Montezemolo, 2009). It has a proven track record of providing useful information to entities that are having difficulty explaining costs of outputs (Kinney & Raiborn, 2009) and also provides clearer information regarding waste (Brewer et al., 2010). Elimination of wasteful consumption of resources frees those resources up for more productive employment.

Activity-Based Costing is a component of Activity Based Management, which is central to the continuous improvement mentality in business today (Kinney & Raiborn,

2009); its methodology abandons the one-size-fits-all measurement paradigm and replaces it with measurements that correspond to an organization's many activities, processes, and outputs (Brewer et al., 2010).

Generating cost efficiencies requires an accurate understanding of what causes costs, and because Activity-Based Costing illuminates the causes more clearly and accurately, management gains the ability to differentiate value added from non-value added activities (Kinney & Raiborn, 2009), permitting decision-making to achieve greater efficiencies. Value added activities increase the value of a service or product to the customer whereas non-value added activities do not; therefore this information enables an entity to increase output value while holding the line or even reducing costs (Kinney & Raiborn). To accomplish this, Activity-Based Costing uses an increased number of cost pools segregated according to activities, a sufficient number such that each pool is relatively homogeneous; therefore, costs are assigned using appropriate drivers, improving accuracy as well as clarity (Brewer et al., 2010). For example, if a school selected API Test scores as one of its outputs, the Activity-Based Costing analysis would enable that school's principal to know the inputs and cost of elevating a student's API Test score.

The Activity-Based Costing methodology of connecting inputs to outputs has been shown to enhance visibility of businesses processes and cost structures and support improved performance through cost reduction and process improvements (Jipyo, 2009). This argues for Activity-Based Costing's capacity to provide the information necessary to improve outputs through better understanding, control, and measurement of an entity's processes and outputs (Kinney & Raiborn, 2009). Pierce (2004) documents Activity-

Based Costing as a means for helping in strategic development and notes a high rate of success with Activity-Based Costing across a wide range of uses including budgeting, costing, and profitability analysis, ultimately improving decision-making.

Examples of successful Activity-Based Costing implementations abound. In for-profit entities, the information Activity-Based Costing yields can cause companies to discontinue some unprofitable products they had previously thought were profitable due to the cost shifting, creating new capacity to focus on more profitable products; similar impacts can be observed with customers – revealing which customers are most profitable and should be retained, and which should be dropped (Brewer et al., 2010).

For example, Meridien Research of Newton, Massachusetts used customer relationship management software based on the Activity-Based Costing model to determine that 20 percent of its customers generated 150 percent of its profits, while 30 percent depleted 50 percent of its profits (McKendrick, 2001). Insteel Industries, a wire manufacturer located in multiple states was able to cut its non-value added costs from 22 percent of total activity costs down to 17 percent (Narayanan & Sarkar, 2002). Euclid Engineering, a parts supplier to large automobile manufacturers, found Activity-Based Costing enabled it to more accurately determine the cost/benefit relationships related to its engineering processes; it subsequently gave its customers choices to select or not select certain product enhancements, allowing those customers to determine whether the anticipated benefit of a particular process to them exceeded Euclid's cost of providing it (Kaplan & Cooper, 1998).

But Activity-Based Costing is not without its caveats. It requires the commitment of senior management and involvement of all major elements of the organization,

enabling an understanding of the organization's mission, what its customers value, and appropriate measures of performance in pursuit of that mission (Euske et al., 1998). Because it is time consuming and costly, the proper management culture is critical to Activity-Based Costing's success; management must believe in Activity-Based Costing and furthermore have the capacity to implement it in a technically sound fashion (Swenson & Barney, 2001). Barriers are numerous and include company culture, fear, and the fact that Activity-Based Costing does not conform to generally accepted accounting principles required for normal financial reporting (Kinney & Raiborn, 2009).

Costs of implementation are decreasing, however, as the information age matures. Despite this, it remains critical to ensure Activity-Based Costing's benefits outweigh its costs to implement, and that the data yielded by that implementation will be used (Brewer et al., 2010). Put another way, Activity-Based Costing does not cause cost reduction on its own or merely because it has been implemented; it requires someone to use the information it yields to achieve those reductions (Kinney & Raiborn, 2009). Even though the cost and effort of implementing Activity-Based Costing remain significant, adoption of Activity-Based Costing is viewed as a viable solution to reporting inaccuracies (Hicks, 2005) because of its direct connection of resource consumption to outputs of the enterprise (Narong, 2009).

Activity-Based Costing in the Public Sector and Service Industries.

Application of Activity-Based Costing into public sector and other service environments has eventually followed its growing use in for-profit environments (Brewer et al., 2010). In the public sector, government's lack of a profit motivation has resulted in a lag of adoption of management accounting techniques compared to industry, but introduction of

a cost accounting system in a public sector environment can enhance awareness, strategies, and performance evaluation (Geiger, 1993/1994). Increasing fiscal pressures for performance accountability in public sector entities will require leaders to adapt and improve; Activity-Based Costing is one of the methodologies for accomplishing this (Gruenebaum, 1997/1998). Activity-Based Costing is a valuable tool to accurately determine product and service costs, something that is becoming more and more essential to government departments, many of which operate on a cost recovery basis (Adjaoud, 1997).

For example, Harr & Godfrey (1992) investigated the potential of shifting a public sector operation facing severe budget constraints from the traditional chart of accounts line item budget to an output oriented operating budget analysis, finding positive outcomes; England's Defense Logistics Agency achieved improvements in its efficiency and effectiveness through assessing its performance and cutting its costs using the Activity-Based Costing methodology.

Kline (2003) notes Activity-Based Costing's increasing use, and makes an argument for its application in public sector entities, noting two specific reasons. First, Activity-Based Costing provides the means of benchmarking public services against private sector alternatives; second, government entities' usage of cost and efficiency as performance measures require accurate cost information and placement.

Benchmarking against the for-profit sector is not unique. A Federal government organization in Washington D.C. was among several that were mandated to adopt commercial measures as a means of streamlining operations and improving accountability (Sagan, 2004). In conjunction with this, Activity-Based Costing

methodologies were adopted and utilized successfully to reduce costs and identify excess capacities; as noted earlier, however, there is an imperative that the organization's participants possess the requisite technical abilities (Sagan).

Related to these benchmarking-type efforts is an increase in public sector outsourcing when it is advantageous to do so. Many times government entities make the wrong decision regarding outsourcing a particular service, choosing to outsource when it would be better not to do so, or choosing not to outsource when it would be less expensive to have another entity perform the service (Kee & Robbins, 2003). Kee and Robbins suggest government's constrained resource usage can be better understood using an Activity-Based Costing methodology and, hence, that the decisions of whether or not to outsource in particular instances can be made more accurately when the relative costs and benefits are understood properly.

In one successful application of an Activity-Based Costing-type approach in a non-profit setting, traditional cost estimation was shown to be inferior to the strategic management methodology in examining cost drivers in Norwegian primary and secondary schools; the cost driver approach provided a framework for selecting a broader set of variables to explain costs than was yielded by the traditional cost estimation techniques (Bjornenak, 2000). Bjornenak found significant complexity in schools' cost structures, and multiple causal relationships including, most uniquely, institutional factors and government policy – items not commonly found in the for-profit sector. Despite its ambiguous nature, Bjornenak found that the cost driver approach was useful in explaining the causes of costs and resource usage.

The City of Indianapolis is well-known for improving its performance and efficiency through application of Activity-Based Costing techniques. Indianapolis has used Activity-Based Costing successfully in its privatization initiatives, enabling it to correctly evaluate whether it would be more efficient to keep services in-house or outsource them (Mullins & Zorn, 1999). The U.S. Government has also utilized Activity-Based Costing to properly set fees for its immigration services as well as to better monitor and improve its costs of providing veterans' death benefits (Kaplan & Cooper, 1998).

Valderrama & Sanchez (2006) analyzed the relative advantage of utilizing an Activity-Based Costing model for public universities and found that Activity-Based Costing methodologies contributed positively to producing the information needed for managers' problem-solving. In another higher-education setting, United Kingdom universities successfully utilized Activity-Based Costing to understand faculty, department, program, and support costs by linking them to income streams and determining value added (McChlery, McKendrick, & Rolfe, 2007).

But service industries and governmental agencies can present unique challenges compared to for-profit manufacturing environments; identifying service industry processes can be problematic (Euske et al., 1998). For example, a restaurant's output is a curious combination of a tangible product (the food and drinks), and also the intangibles including the quality of the service, ambiance of the facility, and even the attitude of the personnel; these multi-faceted attributes make service entities' output components difficult to define and measure (Euske et al.). This corroborates the results of Bjornenak's (2000) determination of complex cost drivers in schools, discussed above.

Charter School Flexibility and Autonomy. Charter schools bear their name because they operate under contracts called charters; they enjoy relative autonomy compared to their traditional counterparts although, from state to state, politics affect the degree of that autonomy and the areas in which it exists such as fiscal, curricular, etc. (Buckley & Fisler, 2002). Although they must comply with some district regulations and policies, charters are independent and autonomous entities from a legal and a fiscal standpoint, possessing substantial decision-making authority over who is hired and how money is spent (Geske et al., 1997).

Policymakers believe charter schools' autonomy will contribute toward educational innovation, not only because of their flexibility, but also because of the pressures of the relatively market-driven environment in which they exist (Geske et al., 1997). Parents and students can "vote with their feet," choosing to attend, or not to attend, a particular charter school. Charter schools, therefore, face a competitive aspect not present in traditional schools, because they need to attract students to survive (Gawlik, 2008).

Further substantiation of charters' relative autonomy can be found in Gawlik's (2008) investigation of charter school principals. Gawlik compared charter schools and traditional schools in a quantitative study utilizing a staffing survey, finding that the principals of charter schools do, in fact, possess more autonomy than their traditional school counterparts. But, with that additional autonomy and empowerment also comes increased accountability (Gawlik).

One of the benefits of charter schools' flexibility is their ability to tailor their programs to the specific needs of their students; each school has a unique set of student

attributes and requirements, and the charter document provides the framework within which those needs can be addressed on a school-by-school basis (Caldwell, 2008).

Charter schools are therefore seen as one key element in school reform, and there are many arguments both in favor and against them as a vehicle for affecting change (Kelly, 1997). Charters are increasingly supported by academia and enjoy support of politicians, as well, in part because of the flexibility they enjoy (Kelly).

Even President Obama and his Secretary of Education, Arne Duncan, are on board, championing the charter movement and adding significantly to its momentum, including financial support contained in the American Recovery and Reinvestment Act (Maxwell, 2009). Further, Secretary Duncan has explicitly stated that states demonstrating unfriendliness toward charter schools will be low-priority when the time comes to make expenditures from the $4.35 billion Race to the Top fund that is part of the administrations larger economic stimulus package (Maxwell). Despite this support, charter schools still do not receive adequate funding for their facilities, and this can retard their teaching efficacy (Smith & Willcox, 2004). This lack of funding is evident in Moody's Investor Service's bond ratings; its median bond ratings for charter schools is Baaa3, considerably inferior to its A3 rating for debt held by traditional public schools (Smith & Willcox).

It remains to be seen whether or not charter schools will be a linchpin in educational reform. Research is inconclusive with regard to their decentralized governance structure; it remains a viable possibility yet it is unclear to this point and questions remain regarding whether the charter independence is the panacea many claim it to be (Baker & Elmer, 2009).

Summary of Literature

Present school financial reporting systems lack clarity, and do not provide meaningful management information to facilitate decision-making for resource maximization. This is an impediment to affecting educational reform and improved student outcomes. Systems are improving, however, and there is credible documentation that these improvements are having a significant positive impact on results through reallocation of existing resources to better uses.

Activity-Based Costing is a unique costing method used successfully in the for-profit sector and also in many non-profit environments including educational institutions. Activity-Based Costing's linking of inputs clearly to outputs provides leaders with data they can use to make meaningful improvements. Examples of successful implementation in service and educational environments exist, but Activity-Based Costing has not yet been tested in elementary schools.

Past studies have attempted to link school resources and outcomes with mixed success; one of the problems encountered is aggregation of data that obscures clear connections. Most of these studies use regression to find relationships between inputs and outputs, but do not explore the processes that produce the outputs; hence, they treat schools like a "black box." Activity-Based Costing specifically identifies inputs and outputs, and the processes and activities that turn inputs into outputs. Thus, Activity-Based Costing has the potential to open up the "black box" of the school, revealing a deeper understanding of how inputs can be transformed into outputs most efficiently to improve school performance.

Charter schools have the requisite autonomy and businesslike mentality to use Activity-Based Costing for their benefit. Charter schools face funding constraints and Activity-Based Costing presents an avenue to understand their resource use better and make changes for improvement based on that information.

Chapter 3: Methodology

This study utilized a combination of qualitative and quantitative data to determine if an Activity-Based Costing analysis can provide a charter elementary school with insights about its operations that will lead to improved efficiency and effectiveness.

The school's service outputs such as student achievement or teacher performance were defined and the processes necessary to produce those service outputs were mapped (diagrammed). The basic components (activities) comprising those processes such as teachers' and others' time performing various job functions were also determined. Logical cost pools such as "teaching" or "library," were also identified.

Costs of inputs were captured from the school's financial reports and then accumulated into cost pools called responsibility centers, then assigned from those responsibility centers to specific activities using various applicable means such as relative time spent on each activity. Activities' costs were then accumulated into the processes and service outputs they support resulting in total costs for those service outputs that were easily traceable back to their sources and causes.

Parent volunteer and board of director hours were also assigned hourly values based on the researcher's and school management's judgment and those dollar values were accumulated into responsibility centers as well.

Support costs such as supplies and facilities were accumulated into their own independent responsibility centers, and then assigned to the teaching and other primary responsibility centers described above based on square footage utilized or using other reasonable estimates based on data obtained. Those support costs therefore were

ultimately assigned in conformity with the assignment methodology of the primary responsibility centers.

The resulting cost summary and detail information was then presented to top administrators at the school and their opinions regarding its usefulness toward improving their school's quality were obtained.

Research Questions

1. Can an Activity-Based Costing analysis of a charter elementary school:
    a. Identify measurable services produced by the school?
    b. Identify the activities and processes that produce those services?
    c. Trace the costs of the activities and processes to accurately estimate the costs of services produced?
2. Can an Activity-Based Costing analysis provide insight that will lead to more efficient allocation of resources to support student achievement?

Organization of This Chapter

This chapter continues by describing why Activity-Based Costing has potential to improve management decision-making at a charter elementary school and, in turn, its students' performance. Following is the research design, including a description of the research setting. A detailed description of the work performed is presented next, including the manner of designing, using, and analyzing the Activity-Based Costing data to draw conclusions regarding its usefulness. Finally, this chapter concludes with a discussion of the role of the researcher.

Activity-Based Costing Method for Understanding Costs

Activity-Based Costing has the potential to provide more useful information to a charter school's management than traditional financial reports provide because it reports costs in a more meaningful manner. By redesigning the reporting flow of costs to correspond with the school's outputs (outputs determined by the school's management), a clear understanding of the specific inputs consumed by each school output is made possible. Understanding costs, their causes, and what is produced by them is critical to effective management, and Activity-Based Costing has been proven to do this better than traditional means in both for-profit and non-profit settings, as documented in the preceding literature review. Activity-Based Costing has not been tried in an elementary school, but successes in other non-profit and social service organizations indicate that it can provide the same benefits as elsewhere.

The need for Activity-Based Costing evolved as entities became more complex in their operations, producing increasing combinations of products and services with the same inputs. A charter elementary school produces multiple outputs with the same inputs, as well. For example, a teacher supports student graduation and also parent engagement. But under present reporting systems that teacher's efforts are not reported in a manner showing the amount of time he or she spends to support each objective (output), because financial reports do not delineate costs using those categories. Instead, the teacher's wages are subsumed in the salaries and benefits category that includes salaries of others; and furthermore the purpose of those salaries is not reported. This same situation exists for all costs at the charter elementary school, including administrators, other support personnel, support services such as the library, and facilities

costs. Further, leaders at these schools generally do not know how they use their resources in relationship to the services or outcomes they produce.

School management makes decisions designed to get the most out of limited resources, but lack of clear connection of inputs to outputs in the available management information inhibits its capacity to make those decisions efficiently or to properly understand the tradeoffs. Activity-Based Costing addresses this lack of information by identifying outputs and determining the supporting processes that create the outputs, including meaningful details of their costs such as which personnel and how much of their time, and which supporting services and facilities and how much of those it takes to produce those outputs.

This study determines whether the Activity-Based Costing methodology is practicable at a charter elementary school, and whether it can produce valuable insights for the school's administrators and facilitate better decisions regarding their resource use. This is done by determining the school's outputs and defining the processes and activities that produce those outputs, then identifying, costing, and reporting the resources consumed to conduct the activities that produce those outputs.

Through an iterative process including interviews, observations, personnel time logs, and more, this charter school management was ultimately presented with its costs classified and detailed according to its own vision of what the school produces. Conclusions regarding Activity-Based Costing's usefulness were then elicited from the school's management and summarized in the conclusions of this analysis.

Research Design

Research Setting – An Urban Elementary/Middle Charter School. The subject school for this research is an elementary/middle charter school located in the City of Los Angeles. A charter school was chosen versus a traditional school because charter schools have more autonomy in decision-making than their traditional counterparts (Bulkley & Fisler, 2002); consequently, they have more control over how to use their resources.

Charters are legally and fiscally independent entities, created through a "charter" document that must be approved by existing governance entities such as local school boards or state school authorities, but must nevertheless still adhere to certain state mandated standards (Geske et al., 1997). It is this managerial flexibility compared to traditional schools that makes charter schools a reasonable choice for implementation of Activity-Based Costing, because it allows school leaders the flexibility to make changes in how they utilize their resources based on the information provided.

The subject school is a charter dual-language immersion school located in a district of Los Angeles that was historically suburban but is transitioning to an urban environment as it ages and more people migrate out from the city's core and also from other countries, particularly Latin America. The school first opened its doors in 2001 at the church site where it presently operates. Some of its facilities consist of classroom buildings that are a part of the original church complex built around the 1960s; the remainder consists of portable classrooms on permanent foundations erected for the school itself.

Total student enrollment is approximately 332, the pupil teacher ratio is 19.5, and the school's 2009 Base API and Statewide Ranks are 728 and 2, respectively; this places its Base API below the statewide average of 788 for grades 2-6 and 748 for grades 7-8, but places its Statewide Rank above the state's similar schools rank of 1 (www.ed-data.k12.ca.us, 2010). Restated, this school's students perform below the state average on the API tests, but rank above the average for schools classified as being similar to it.

The student body is comprised of 73.5 percent Hispanic, 9.0 percent white, 2.7 Asian, 2.4 percent African-American, with the remaining students coming from various other ethnicities or not reported; all of its teachers are Hispanic (www.ed-data.k12.ca.us). Approximately 98 and 133 of the school's students are classified as English learners and socioeconomically disadvantaged, respectively (www.ed-data.k12.ca.us).

Research Sample, Data Sources/Collection, Instruments and Procedures. This study utilized an action research approach entailing combination of quantitative and qualitative data to reconstruct costs at this charter elementary school. The qualitative methods (focus group, interviews, observations, etc.) were used to determine this school's inputs and service outputs. The activities and processes required to produce those outputs, the personnel who participate in the processes, and the support facilities used by each were also determined. The quantitative data consisted of people's time tabulations, assignments, and their dollar costs. The time tabulations and costs were then used to accumulate costs into the activities and processes, and then ultimately into the service outputs. The remaining facilities and support costs that could not be assigned specifically using the time tabulations were assigned in another reasonable manner according to their usage.

This section is organized into the project's phases as described in the methodology overview section of the introduction:

1. Identify the school's outputs and major processes leading to them, the individuals contributing to the processes, and the responsibility centers through interviews with top school administrators and create rough-draft process maps.
2. Identify specific activities that make up the processes defined in phase one, determine what causes those activities, and expand and refine process maps through further interviews with administrators and also interviews, observations, and pilot survey time logs from a small, judgmentally selected sample of teachers.
3. Finalize activities and organize them into final processes and process maps through a final round of interviews with administrators, and finalize and harmonize the detailed time logs of teachers and administrators with the process maps.
4. Detailed data collection: Obtain completed time logs from all teachers and top administrators at the school, indicating their best approximation of how they use their time in accordance with the activities and outputs determined in previous phases. Obtain the school's most recent fiscal year financial data and categorize its contents into the identified cost pools. Obtain volunteer time logs and board of directors' time; assign values to that time and categorize results into the identified cost pools.

5. Calculate the costs of the school's outputs defined in phase one; build the Activity-Based Costing analysis by distributing dollar amounts from cost pools to activities, summarize the activities into outputs, yielding costs for activities and summary costs for each process output to which they contribute.
6. Analyze and assess results with school administrators to determine potential for redirecting existing school resources to more efficient/effective uses to improve its outputs.

Phase One – Identify Outputs, Processes, and Responsibility Centers; Create Rough-Draft Process Maps. The purpose of this phase was to brainstorm with top management at the school to define the school's outputs and who and what resources go into producing those outputs. Decisions made in this phase shaped the overall structure of the Activity-Based Costing analysis and the model of how it would be designed and implemented for the subject school. Focus groups were used to develop a visual depiction the school's operations and outputs and then expand and add detailed components to it.

Fieldwork actually began at a school site that ultimately was not studied due to an unexpected illness of its executive director. Nevertheless, two meetings were held at this initial location prior to switching to the school site at which the analysis was actually performed. The first meeting at this site was with the school's executive director during which Activity-Based Costing was described and potential basic outputs for the school were considered and identified.

The second meeting at the initial site was with this school's focus group (hereafter referred to as an "advisory board") designated by the executive director, and included selected teachers and school board members, the school's financial manager, and personnel from its outside financial services and reporting provider. The Activity-Based Costing methodology was explained to this school's advisory board, as well as the broad objectives of defining its responsibility centers, processes, and outputs that would serve as the components and structure for the cost analysis.

The advisory board, in conjunction with the researcher, then determined preliminarily how it wanted to define its school's outputs and the processes leading to them; potential output categories included API Test scores, graduation rates, etc. The objective of this meeting was so the researcher could obtain sufficient information about the school's operations and outputs to build the graphical model (hereafter referred to as a "process map") that would serve as the conceptual framework to perform and apply the Activity-Based Costing analysis. Following this meeting, the researcher in fact developed the initial process map for this school, graphically depicting its basic overall structure and the flow of how its inputs might be organized, and generally how those inputs would be distributed and accumulated among the school's processes and outputs.

Upon moving to the second school site where this study was actually completed, the researcher brought with him the rough-draft process map that had been created at the first school, complete with cost pools, processes, and outputs. The advisory board at this school consisted of all four individuals comprising its top management team. At this initial meeting, the Activity-Based Costing analysis was described in the same manner as described to the previous school's executive director and advisory board. This school's

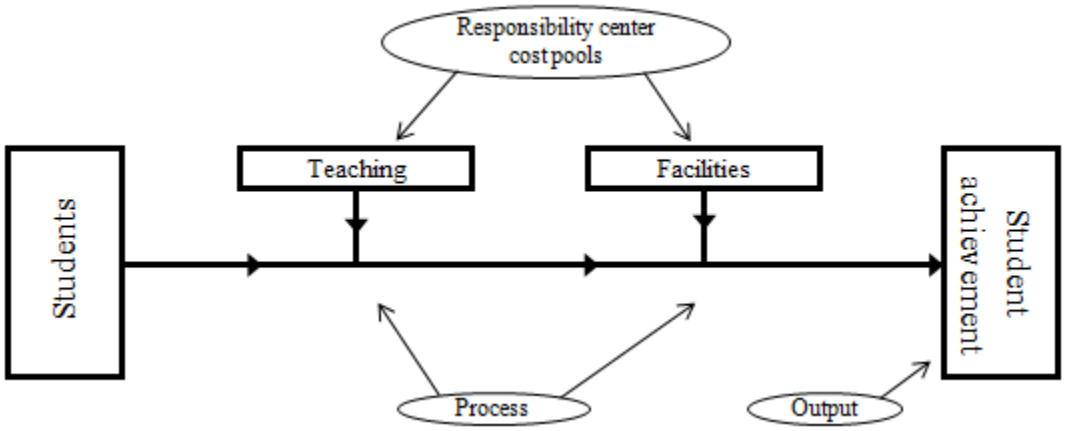
advisory board and the researcher then adapted and modified the outputs from the original school to the particular situation and outputs desired for this school.

As the outputs were selected, defined, and modified from those of the previous school, the advisory board also considered and modified the processes that lead to those outputs, making additions and deletions from the process map that had been created for the previous school site until it reflected properly this advisory board's broad vision of how its site was structured. The most notable change at this early formulation stage was the elimination of counseling as a separate identifiable input. The first school had a portion of its administrative offices dedicated to counseling and had dedicated counselors performing that function, and its advisory board had therefore selected counseling as one of its major separable inputs. But the second school was smaller, and so the counseling function was an integral part of the overall administrative function; there was no separate physical space dedicated to counseling and, in fact, it was performed by the administrators themselves, interleaved with their other day-to-day activities. The process map was therefore modified to remove counseling as a major input with the understanding that, at this school, it was a component of the administrative input.

Below is an example of one process among many a school's advisory board might define. As shown in this example process map introduced earlier in this paper, the advisory board looks conceptually at its school and defines its operations as a collection of processes, of which student achievement might be one, and begins to consider the manner and degree to which specific inputs support each process' output.

Figure 3.1

Sample Process Map for Student Achievement



Another objective of this initial formulation of how the Activity-Based Costing methodology defines the school is determining the school's responsibility centers. Responsibility centers are the cost "pools" into which activities' costs are collected for subsequent assignment to the various processes identified by the advisory board and are included in the sample process map, above. In connection with this, the Activity-Based Costing methodology utilizes a two-step process. The first step is collection of all costs into identifiable responsibility centers (the cost pools); the second step is to assign costs from those responsibility centers to the school's activities within its processes and, ultimately, to the outputs the advisory board has defined.

Therefore, as this school site's advisory board considered how the schools various inputs and processes fit together to create the outputs it had identified, it also considered the most appropriate manner of categorizing its inputs into the responsibility centers that would serve as the collection pools for the costs that would be assigned to the processes and subsequently to its outputs. One potential responsibility center is teaching, because it is an identifiable set of resources for which costs can be captured into a cost pool; another

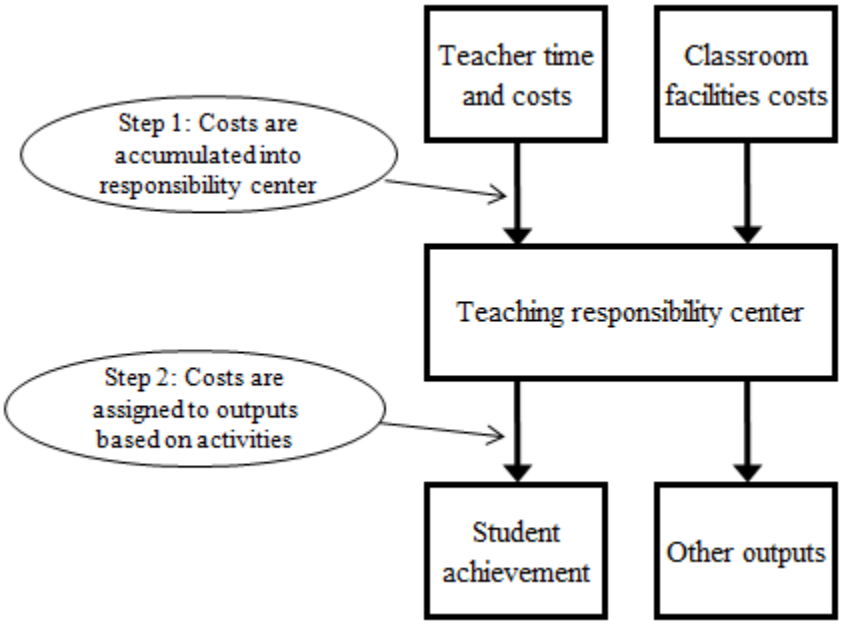
is the school library, because it is an identifiable set of resources with a manager. Examples of costs that might be captured into the teaching responsibility center include teacher time, teaching assistant time, and any other personnel and/or support costs that are identifiable as being a part of teaching responsibilities.

Put another way, in the first step of the Activity-Based Costing procedure, the costs of personnel and other inputs are collected from the school's most recent historical financial report and accumulated into their respective responsibility center cost pools. In addition to the dollar costs shown on the financial report, values are also assigned to parent volunteers' and the school's board of directors' time and added into cost pools as well because, although the school does not pay for these inputs, they do have value and they are manageable. In the second step, these costs are assigned to the processes based on how much of each responsibility center's resources and efforts are devoted to each process and output. This second step assignment of costs is based on the data collected in subsequent phases of this project (e.g., time usage logs for teachers).

Below is a simplified sample view of this two step process, as depicted in the introduction section of this paper:

Figure 3.2

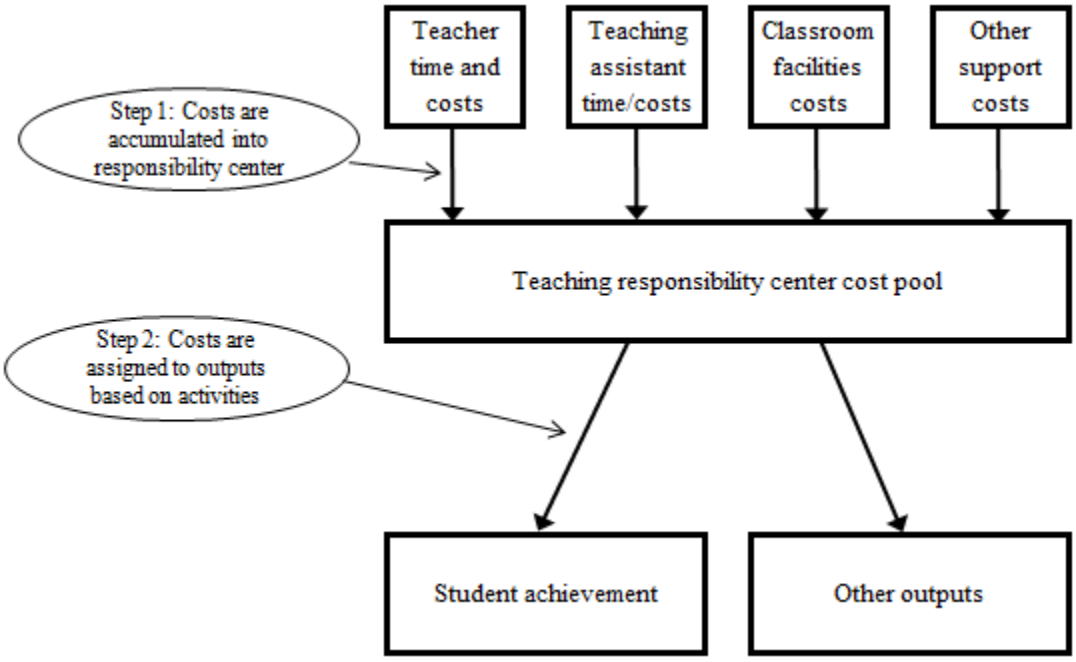
Simplified Activity-Based Costing Analysis



Expanding on the above example, assume that four identifiable costs are included in the teaching responsibility center cost pool. Assume further, that teaching is one of the inputs that leads to student achievement, one of the outputs that has been identified by the advisory board. In the first step, each of the costs identified as part of the teaching responsibility center is collected into that cost pool, including the teaching costs of the school's teachers. In the second step, activity measures such as teaching time spent on each process, including student achievement, are determined and used to assign the costs that have been collected into the teaching responsibility center cost pool to the student achievement process. The details of the teacher time assignments are determined based on data collected in phase four of this project and the costs are determined in phase five.

Figure 3.3

Expanded Activity-Based Costing Analysis



Other costs collected into the other responsibility center cost pools are assigned to processes and outputs in a similar manner, using activity measures appropriate for them such as hours of other personnel's time or proportion of facilities dedicated to a particular process. (Note that although the advisory board is identifying inputs during this phase, data used to assign the costs from the teaching responsibility center cost pool to the processes it supports is collected from the teachers and other individuals performing those duties in phases two, three, and four of this project.)

Although only one box is shown for "other outputs" in the example above, there are as many outputs as the advisory board determines and defines as being supported by the teaching responsibility center cost pool.

In summary, during this phase the researcher provided the advisory board with the basic premise, objectives, and methodology of the Activity-Based Costing analysis, then

the advisory board made its initial determinations of how its school was operationally structured – working backwards starting with the school's outputs, then the processes leading to those outputs, the responsibility centers supporting the processes, and finally the inputs to the responsibility centers. These initial decisions determined the overall structure of the Activity-Based Costing analysis for this school; but they were subject to modification and fine-tuning as further data was collected in later meetings and during subsequent phases of the project.

Phase Two – Determine Activities Supporting Processes and Cost Drivers, Refine and Expand Process Map and Develop Time Logs. This particular school's management possesses strong business acumen. Therefore, because the initial meeting was a modification of the previous school's rough-draft process map rather than building one from scratch, this advisory board's initial meeting continued on to the initial determination of some of the activities contained in each of the processes. These activities are the building blocks of the processes; they depict the basic components that comprise a process and lead to its outputs.

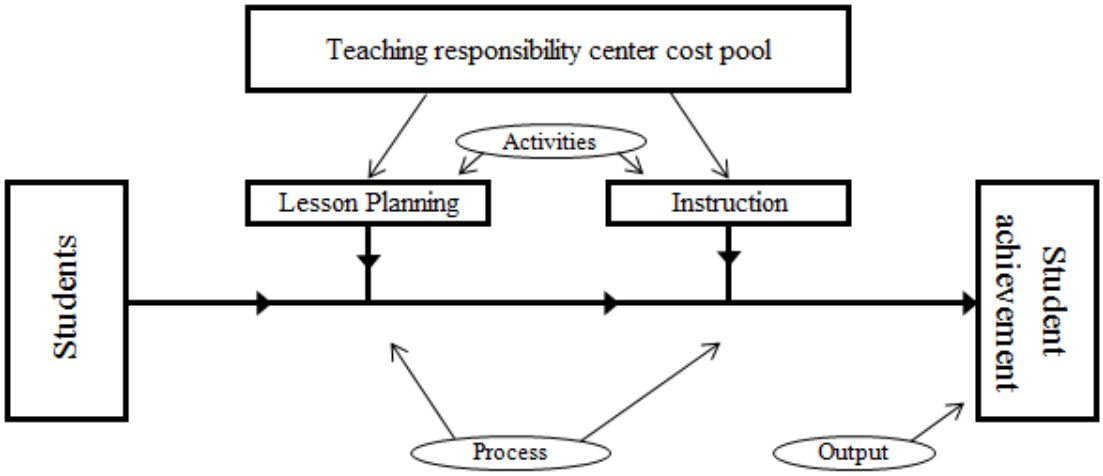
Using the basic process map composition of the school's structure defined by the advisory board in phase one (its outputs and the processes and inputs supporting those outputs), the advisory board began identifying activities and fitting them into its processes. For instance, the details of how teachers spend their time and what activities they perform to support the school's processes were identified (e.g., lesson planning and instruction for the student process). What emerged was a more detailed process map that included most of the cost input categories (cost pools) and activities (the building blocks of the processes) that were ultimately used in the final analysis. This school's process

map and a list of its activities with definitions are presented in the results section of this paper.

Below is an expanded version of the Sample Process Map for Student Achievement presented earlier, introducing into it the activities that are the building blocks of the process residing between the responsibility center cost pools and the outcomes. Most organizations have multiple processes, and three were determined to most appropriately represent this school's main functions – relating to student achievement, teacher retention and motivation, and parent engagement.

Figure 3.4

Expanded Process Map for Student Achievement



Restated, the overall manner in which the school's inputs and processes support its outputs was determined in phase one (subject to modification); and more specific data regarding the activities contained in each process was collected in phase two, initially from the advisory board in this initial meeting – then subsequently directly from teachers

through interviews and observations, and then again through further meetings with the advisory board.

This provided the next level of detail – the specific activities individuals such as teachers perform and how those activities fit into the school's processes. Determining the individuals' activities in various parts of the school in the initial advisory board meetings also provided the data needed to create rough-draft time logs that were modified as described below and ultimately used for detailed data collection in phase three of this project.

Referring back to the Expanded Activity-Based Costing Analysis exhibit presented several pages back, teachers' time and cost was identified in that example as an input of the teaching responsibility center cost pool. In phase two of this project, subsequent to the advisory board's preliminary determination of activities contained in each process, data collection was then expanded to include a series of interviews and observations of a purposefully selected sample of teachers to ensure the accuracy of the identified specific activities they perform.

Three teachers were purposefully selected by the school's advisory board for interview and observation, including one kindergarten-first grade teacher, one fourth grade teacher, and one middle-school teacher. Two of the selected teachers were female, one was male. These three teachers were interviewed and observed in their teaching for the purpose of fine-tuning and adjusting the identified processes as appropriate, and ensuring the activities those processes contained appeared accurate and complete.

In semi-structured interviews, these three teachers were presented with the process maps, including the cost pools, activities, and outputs that were the product of the

advisory board's analysis, and asked to comment regarding the accuracy of those processes and their component activities. They were also asked to elaborate regarding any additional specific activities they perform to support those processes and also to describe their typical workday from start to finish. Further, each teacher was observed for an entire lesson period so the researcher could ensure harmony among descriptions the teachers provided regarding their activities. (See Appendix 1 for the Teacher Interview Protocol.)

Results of these interviews and observations were triangulated and compared among the interviewee teachers and with the advisory board in an iterative process until substantial agreement was reached regarding all of the processes and their component activities.

The product of all of the above was a proposed time log for the school's teachers containing all of the activities that had been identified. This time log was provided to the three interviewed teachers and they were asked to complete it, reporting on it the number of hours they spend working in a typical week and specifying, according to the log's shown activities, how they spend that time. (See Appendix 2 for the Teacher Time Log.)

Specifically, using the activities determined through meetings with the advisory board and subsequently fine-tuned through the interviews and observations of the selected teachers, the teacher time log was created. This time log therefore had line items directly correlated to the activities on the process map. The three teachers who had been interviewed and observed were each asked to complete a time log for a typical work week, categorizing their time for that typical week into the activities on the teacher time log. These teachers were also asked to comment and opine, subsequent to their

completion of the time log, regarding any final changes needed to ensure the log was as realistic, accurate, and as easy to complete as possible.

Concurrently, an administrative time log was also developed by the researcher in conjunction with the school's advisory board (who were also the school's administrators) and that time log, once agreed upon as to its structure and the activities it should contain, was utilized for detailed data collection in phase three of this project. (See Appendix 3 for the Administrator Time Log.)

It should be highlighted that the methodology for developing the teacher and administrative time logs utilized interviews and observations in the present time at which the research was performed. Further, subsequent procedures described below will detail distribution of the finalized time logs to teachers and administrators for their completion based on their present assessment of their typical work week as of the time of log completion. However, the financial reporting results used in subsequent phases of this analysis necessarily used data from the past; the most recent complete fiscal year-end results available were from the prior fiscal year.

It therefore became a concern that using personnel's time usage data from the present year to assign dollar costs from a prior year could result in inaccuracies because of this mismatch of time periods. If the school's operations had been modified or had changed significantly from the prior year, the financial results of that prior year would not match correctly with the time usage data collected in the present year.

The researcher explained this potential mismatch to the school's advisory board, and inquired if significant changes had occurred at the school – including changes in funding mechanisms, assignment of personnel, distribution of students, program changes,

or any other operational or fiscal change between the two years. The advisory board reported that, with the exception of a slight increase in the number of students from the prior year, the school's operations had not changed between those two years.

This similarity in operations from year to year was also corroborated in the interviews with the kindergarten, fourth grade, and middle school teachers. Each had been teaching at this school, and at the same grade level, for several years. It was clear from the evidential matter each of those teachers presented in their respective interviews and observations that they were performing their activities in a well-established manner. For example, one teacher showed teaching planners that were carried forward from year to year and modified only slightly. Another teacher was very clear that the teaching material for student projects and other activities was carried forward and modified only slightly from prior years.

Based on the advisory board's confirmation that the school was operating similarly to the prior year, and confirmed by the unsolicited evidential matter from each of the interviewed and observed teachers, the researcher concluded that the potential for significant errors in cost accumulations and assignments through this analysis due to the mismatch of years described above was remote and negligible. (This issue is also addressed in the limitations and delimitations section of these results.)

Phase Three – Finalize Process Maps and Activities, Finalize Time Logs in Conformity with Process Map and Activities. Upon returning their completed pilot time logs, the three selected teachers reported only one minor descriptive modification to the researcher, and that modification was made; the advisory group requested an additional piece of ancillary information to be added to the teacher time log as well. Concurrently,

the researcher and advisory board agreed on the final composition of the administrative time log and the activities contained on it.

Results of the interviews, observations, teacher pilot time logs, and finalization of the administrative time logs also provided the detail necessary to refine and finalize the process maps and make final adjustments to the specific activities they contained, and bring the activities contained on the time logs and on the process maps into perfect conformity with one another. This set the foundation for detailed data collection of time usage from all of the school's teachers and administrators that would serve as the basis for distribution of the costs from their respective responsibility center cost pools.

Phase Four – Detailed Data Collection. The finalized teacher time logs were distributed for completion by every teacher at the school. All but one teacher returned theirs completed; each administrator completed an administrative time log as well. The logs were not designed to be completed in real time, but instead elicited the teachers' and administrators' report of a typical week. The objective was to obtain the most accurate means possible for apportionment of teachers' and administrators' time spent toward each of the finalized activities and processes, because these time apportionments dictated a significant part of the school's cost calculations described in phase five, below. (See the limitations and delimitations section for more discussion of the time logs and surrounding issues.)

The completed time logs were summarized for each employee category (teachers and administrators), and a percentage of time spent on each activity for each category was derived. Specifically, hours reported by each teacher were tabulated in detail according to their activities and summarized for each. These hours were then

summarized by activity and in total for all of the teachers who returned a completed log. The resulting totals were divided by the number of teachers reporting to arrive at an average workweek for the school's teachers, including average hours spent on each activity.

The researcher noted that the total average hours reported as being spent working in a typical week varied widely among teachers; some teachers reported that their typical workweek contained significantly more hours than others. But teachers are paid salaries, not by the hour. Therefore, teacher hours were restated in terms of percentage of total time as opposed to hours, to give each teacher's log equal weight in the summarized totals and in the average time usages derived from those logs. For instance, a teacher reporting five hours of a 50 hour work week dedicated to the whole group instruction activity was assigned the same 10% as a teacher reporting four hours of a 40 hour work week. In this manner, regardless of each teacher's reported total hours in their typical work week, each teacher's proportionate time spent toward each activity was given the same weight in the summary and averages derived from their logs.

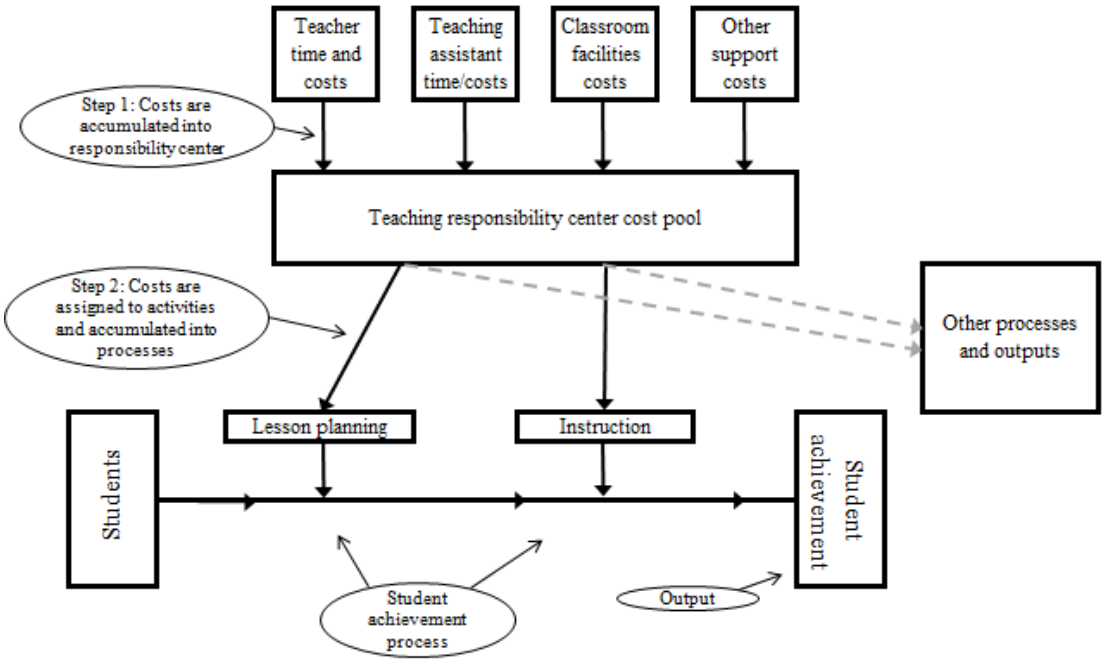
The resulting data, representing how the school's teachers use their time, was used for apportionment of all costs out of the teaching responsibility center cost pool to the various processes supported by that responsibility center. For example, if the teaching responsibility center cost pool contained $1 million dollars in total, and the results of the summary, normalization to equivalency among teacher time logs, and averaging resulted in the school's average teacher spending 10% of their time on the lesson planning activity, then $100,000 (10% of $1 million) was apportioned to that lesson planning activity contained in the student achievement process.

The average work weeks reported by the school's administrators were relatively uniform in reported total hours for a typical workweek. Nevertheless, administrators are also paid salaries, not by the hour. Therefore, the administrator time log data was normalized to percentages and the resulting percentages were used to apportion the administrative responsibility center cost pool in exactly the same manner as described in the preceding paragraphs for the teacher time logs and the teaching responsibility center cost pool.

The exhibit below combines exhibits presented previously to depict more completely how the two step cost collection and assignment procedure connects to a process map through the activities. This is still an incomplete sample representation, but it nevertheless depicts how teaching costs were assigned to the student achievement process. In summation, this exhibit shows an example of how the teaching responsibility center costs were collected, and then how a portion of them was assigned to the student achievement process by assigning portions (percentages) of costs contained in the teaching responsibility center cost pool to activities in the processes supported by that cost pool using the data obtained from the teacher time logs.

Figure 3.5

Composite Activity-Based Costing Analysis



This school's outputs included two other processes in addition to the student achievement process depicted here, and many additional activities were contained in its actual student achievement process as well. These more detailed process maps and outputs that were defined by school personnel and the data collection are presented in the findings section of this paper.

Note that facilities and support costs were assigned to processes based on how they are utilized, referring to the time allocations of people working within those facilities or providing that support, or on a facilities square footage basis. For instance, classroom facilities costs were assigned to the teaching responsibility center cost pool based on the portion classroom square footage represented to total facilities square footage; if total facilities square footage was 25,000 square feet, and included total classroom square footage of 20,000 square feet, then 80% of the facilities costs were loaded into the

teaching responsibility center cost pool (20,000/25,000 = 80%). Therefore, classroom facilities' costs were subsequently allocated to activities in conformity with all other costs in the teaching responsibility center cost pool according to the results of the teacher time logs. A portion of the supplies responsibility center cost pool was loaded into the teaching responsibility center in a similar manner based on management's estimates and apportioned in conformity with all other costs in that cost pool as well.

In essence, therefore, costs captured in support costs responsibility center cost pools (e.g., facilities) were loaded into the teaching and other primary responsibility center costs pools and, in turn, apportioned among the activities those primary responsibility centers support with other costs contained in those primary responsibility centers. Put another way, the facilities cost of the classrooms were included in the teaching responsibility center cost pool based on the proportion of classroom square footage to total facilities square footage, and subsequently assigned in accordance with the teacher time logs to the activities teachers perform within those classrooms.

The second major piece of data required to do this cost analysis was the dollar costs themselves. The 2009-2010 year school financial results as depicted in the financial manager's detailed income statement report was obtained and used as the source for the financial dollar amounts that were assigned to the responsibility center cost pools (and subsequently to the activities, processes, and outputs in phase five).

The researcher reviewed all detailed dollar line items on the school's financial report obtained and assigned them to cost pools. For instance, teacher salaries and benefits were assigned to the teaching responsibility center cost pool, facilities costs were assigned to the facilities responsibility center cost pool.

Items for which the appropriate cost pool assignment was not evident to the researcher were assigned based on consultation with the school's financial manager and other top administrators. For instance, if a detailed account description contained on the financial report did not clearly depict the correct responsibility center to which it should be assigned, the researcher inquired regarding its nature to ensure its correct assignment. Further, some detail accounts required apportionment among responsibility centers; payroll taxes are one example of a detailed account that included costs applicable to multiple responsibility centers. Accounts such as these were apportioned based on consultation with the school's financial manager and/or supplemental calculations. For instance, the total payroll tax cost was apportioned to responsibility center cost pools in accordance with the salaries to which they applied (e.g., teachers' salaries as a portion of total salaries dictated the teaching responsibility center cost pool's portion of total payroll taxes).

Through this procedure, the most recent school fiscal year end total costs were accumulated into the responsibility center pools and summed to determine the total dollar cost of each responsibility center. As depicted in the preceding Composite Activity-Based Costing Analysis exhibit, costs accumulated into the teaching responsibility cost center included teacher salaries, classroom aide wages, classroom facilities costs, and its share of other support costs. The result was a total cost for each responsibility center cost pool that summed to the same total shown for total costs on the financial manager's detailed income statement used as the source.

Another issue was determination of parent volunteers' and the school's board of directors' time, and the appropriate value to ascribe to that time. Because there is no pay

for volunteers, but because those volunteer hours have value and are significant in many school processes and are manageable (e.g., parents making photocopies or working at school events), decisions were required regarding how to value those hours so they could be included in the total valuation of the Activity-Based Costing cost buildup.

The quantity of parent volunteer hours, and the activities to which they were assigned, was determined using monthly parent volunteer time logs maintained by the school. These logs showed the date, amount of time spent, and purpose of that time for all parent volunteers for each month contained in the fiscal year covered by the school's detailed financial report.

The researcher accumulated the twelve monthly parent volunteer time logs into a composite parent volunteer time log for the entire year, and then summed the hours to derive total parent volunteer hours for the entire fiscal year. The researcher then reviewed each line item in the logs and assigned the parent volunteer hours, based on the description for each entry, to activities contained in the school's parent engagement process. For example, if a parent indicated on the time log "work in classroom," those hours were assigned to the "helping students" activity in the school's parent engagement process. In this manner, total parent volunteer hours for each parent activity was derived as well as the sum total of all parent volunteer hours in their entirety.

It is notable that the value of the parent volunteer hours was placed in the school's parent engagement process and not the student achievement process. Initially, the researcher had suggested that these costs be included as an activity contributing to student achievement. However, the school's advisory board was resolute in its desire to reflect all costs ascribed to the parent volunteers in the parent engagement process.

Inasmuch as the Activity-Based Costing analysis' very essence is to develop a costing model according to the school's vision of its structure, the researcher accepted the desires of the school's advisory board and included all parent costs in the parent engagement process. Subsequent to determining final results, the researcher followed-up and assessed the impact of this decision on the cost output; from the standpoint of the student achievement process, the impact was clearly immaterial. From the standpoint of the parent engagement process, the impact was material, increasing that process' total costs by approximately eight percent.

Based on this retrospective view of the decision's impact on the reported costs, the advisory board's position regarding the classification of this parent activity appears to have merit, particularly considering it flowed from their desire to clearly see the parent engagement costs. (Please see the limitations and delimitations section of this paper for a discussion on the potential impacts resulting from judgments and decisions such as this one.)

The dollar value of these parent volunteer hours was determined judgmentally through agreement between the researcher and the school's advisory board, and was set based on California minimum wage of $8 per hour (www.dir.ca.gov) plus a 25% premium based on the researcher's and the school's advisory board's judgment of parental time value in excess of a minimum-wage worker ($8 + $2 = $10) plus an additional 25% for ordinary payroll taxes, Workers' Compensation, and other typical additional costs actual wages ordinarily entail ($10 + $2.50 = $12.50 total value per parent volunteer hour). The value of total parent volunteer hours multiplied by the parent volunteer hourly value was assigned to the volunteers responsibility cost center.

The board of directors' hours were summarized using the number of meetings per year multiplied by the hours per meeting and number of board members, plus each board member's report of additional hours spent independently on behalf of the school. A valuation judgment for board of directors' hourly value was made by agreement between the researcher and the school's executive director, in a manner conceptually similar to that performed for the valuation of parent volunteer hours. One board member was an attorney, and performed considerable pro-bono legal work for the school, so for that member his normal hourly rate for similar work of $300 was used. All other board members' time was judgmentally valued at $100 per hour. The total value of board members' time was added into the administrative/support responsibility center cost pool to be assigned along with all other costs in that responsibility center cost pool in conformity with the administrators' time logs.

As a result of all of the procedures described above, the total value in all responsibility center cost pools was calculated, and the total of all of the responsibility center cost pools combined agreed to the total costs per the school's fiscal year end detail financial report plus the values assigned to the parent volunteer and board of director hours, respectively. This completed phase four of this project and the first step of the two-step Activity-Based Costing analysis. Costs were now accumulated into their respective responsibility center cost pools and were ready for assignment to the various activities contained in the school's processes.

Phase Five – Build Activity-Based Costing Analysis and Determine Costs of Activities, Processes, and Outputs. In this phase, all of the costs of personnel, facilities, and other support costs that were accumulated into the responsibility center cost pools

were assigned from those pools to the activities comprising the processes and then, ultimately, accumulated into the outputs those activities support.

This is the second step in the two-step Activity-Based Costing analysis – assigning costs to the outputs, and resulted in a total dollar cost for each output, for which the components (activities and the specific costs contained in those activities) are identifiable. Put another way, the sum of the outputs, taken together, totals to the same dollar costs reported in the school's detailed 2009-2010 financial report (plus the values assigned to the parent volunteers and the board of directors) but, unlike the traditional financial report, the Activity-Based Costing report total can be understood in terms of the resources consumed to produce each output. For instance, the total contained in the student achievement output could be traced back to its components (activities) identified as contributing to student achievement (e.g., lesson planning), and further backwards to the responsibility center cost pools that caused that activity cost (e.g., teaching responsibility center cost pool) and, finally, to the costs contained in the responsibility center, itself (e.g., teacher salaries, payroll taxes, and benefits).

Explaining this sequence in terms of the the roll-up exhibit below, which is an expanded composite example of those presented earlier in this study and conformed partially to the actual process map for this school, teacher time spent on lesson planning might be Activity 1, teaching assistant time spent on instruction might be Activity 2, both of which are components of the student achievement service output.

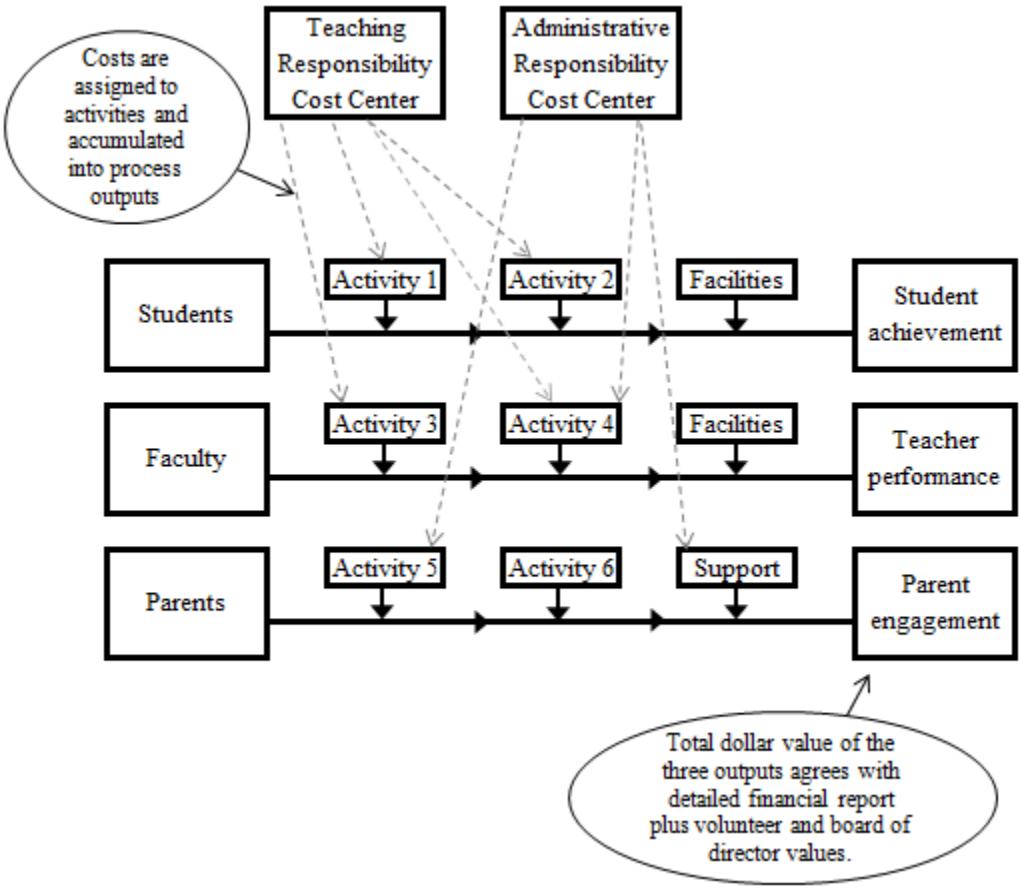
All of the teachers' costs, plus the other costs assigned to the teaching responsibility cost center pool were assigned to the activities the teachers perform as determined by the time logs obtained from them, resulting in an identifiable and traceable

dollar amount in each activity, output, and for the school budget as a whole. Other cost pools were assigned out to activities in the processes as well. The administrative responsibility cost center pool was assigned to activities based on the results of the administrative time logs, the parent volunteer responsibility cost center was assigned to activities based on the parent volunteer time logs, and the library responsibility cost pool was assigned to its own activity within the student achievement process.

The actual completed process map for this school is presented in the results section of this paper.

Figure 3.6

Sample Activity-Based Costing Cost Distribution



Phase Six – Assess Activity-Based Costing Analysis' Value for Decision-Making. The completed Activity-Based Costing analysis is presented to the school's top management and the advisory board for its review and assessment. A budget in the Activity-Based Costing format the advisory board designed in phase one is provided and they are debriefed on its contents, and asked to assess its usefulness as a tool for improving school outputs.

As described in phase one, the advisory board is comprised of school management designated by the school's executive director including selected school board members and the school's financial manager. The results are first presented to the advisory board in a meeting with all of its members. Subsequently, each member of the advisory board is interviewed independently in a non-structured manner to obtain his or her views on the Activity-Based Costing analysis and also to answer any further questions each member may have. A final meeting with the entire advisory board is then conducted to assimilate all opinions and assessments and permit a free-flowing discussion among them that is documented and used for the conclusions of this study.

In phase one of this project, the advisory board determines the major outputs of this charter elementary school and the primary inputs consumed to provide those outputs. In phase six, a new budget categorized according to the outputs identified by the advisory board is delivered to them in the first of two meetings. The first meeting is to describe the details of the Activity-Based Costing analysis for their school including the costs of each output they identified, the cost of the inputs in each according to the inputs they identified, and the manner in which those costs were calculated (as described in phases

two through five, above). Any questions posed by the advisory board are addressed by the researcher at this meeting and subsequently on demand.

The advisory board considers the Activity-Based Costing analysis and its usefulness as a tool for improving school outputs through redirection of resources among inputs, processes, outcomes, etc. For example, the advisory board might determine that less teacher time and more teaching assistant time would benefit the API Test scores output, and that redirection of those resources would free-up teacher time for a more productive use toward another school output.

In a second meeting between the advisory board and the researcher, the results of their value assessment are provided to the researcher. This meeting is, in essence, a final interview of the advisory board from which the researcher amasses its feedback and assessments, and probes regarding that feedback as needed. These assessments are then summarized by the researcher and are presented in the conclusions section of this paper.

Role of the Researcher

The researcher's role was similar to that of an outside consultant commissioned to do a cost study for the charter school. The researcher had extensive training, credentials, and experience with finance and accounting and had performed similar functions throughout his career both as an outside consultant and as a financial manager of corporate entities. In addition, the researcher had training as a teacher, having attained a teaching credential as well as teaching at the college level for over a decade. The researcher's background, therefore, provided a good foundation from which to perform this study in a manner similar to that of an outside consultant.

Prior to undertaking this study, however, the researcher had no experience with the finances of schools, and was further unaware of the operational differentials between charter schools and traditional public schools. It was through literature review and consultations that the researcher gained understanding of the financial independence, operational flexibility, and more business-like competitive environment charter schools have.

All planning of fieldwork, including meetings, interviews, classroom observations, obtaining financial records and other supporting documentation, and presentation of results was orchestrated by the researcher, subject to the charter school personnel's approval and agreement as appropriate. The researcher conducted fieldwork and analysis for this study with no bias toward or against charter schools, and did not have a vested interest in finding value or no value from Activity-Based Costing beyond this study's results.

Summary

This chapter described Activity-Based Costing and its potential to improve management decision-making at a charter elementary school, provided details regarding the school used for this study, and detailed the step-by-step Activity-Based Costing methodology employed. The researcher's role and absence of biases was also described. The following section presents the results obtained, including summary analyses of this charter school's structure and costs, and focused cost analyses of relevant components of the school.

Chapter 4: Results

The Activity-Based Costing analysis is a methodology for restating an entity's costs in a manner that will facilitate improved management understanding of those costs and how the entity uses its resources. In this project, the Activity-Based Costing analysis was adapted to a charter school, and it was designed and formed in accordance with the school management's (advisory board's) view of how its operations produce its desired results and outputs, such as student achievement.

Through a series of meetings with the school's advisory board, five logical groupings for costs (cost pools) and three processes leading to the school's service outputs were identified. This served as the overall structure of the process map. The activities performed to create those identified outputs were also identified and placed into their processes. This formulation process for building the structure of the process map and its components was iterative, and the process map itself was not finalized until after several meetings with the advisory board and interviews with teachers.

The school's costs were captured into pools structured in conformity with its major identifiable responsibilities, and then distributed to the activities it performs to achieve its goals. The results of this study, presented in the following pages, show the identified services produced by the school, its activities and processes that produce those identified services, and the manner of tracing those costs and activities back to their origin. The cost analysis was designed in conformity with the school advisory board's perception of its school's actual operational structure, rather than the traditional financial reporting categories such as salaries and benefits, etc.

Completion of the analysis yielded a graphical depiction of the schools operational structure called a process map, and the process map for this school is presented in the following pages. Further, and also presented herein following the school's process map, are numerous summary and detailed cost reports made possible by reorganizing the school's financial costs in conformity with that process map using the Activity-Based Costing methodology.

These various charts and cost summaries were presented to the school's advisory board for evaluation regarding its usefulness. The advisory board reviewed the data provided and concluded that it had significant value toward improving resource allocation and, in turn, improved student achievement.

The following results are organized into three sections. The first section presents this school's process map, which is the graphic depiction of its structure, and includes the specific responsibility center cost pools that were selected and used to capture and accumulate the school's costs. The process map also shows the school's actual processes that were determined to lead to the outputs the school produces, including the activities those processes entail.

The second section presents some selected summary results, including the actual dollar amounts that were assigned to each cost pool, and how those dollars flowed among the cost pools to arrive at the amounts that were apportioned to the processes. The time usage results from the teacher and administrative time logs are presented in this section as well, since these represent the most basic view of how the majority of school personnel use their time, and also because these time logs were the basis for apportionment of 95% of the school's costs to its processes.

The third section includes all of the output cost reports yielded by the Activity-Based Costing analysis. Shown first is the top-level summary cost report for the school, including totals by process and amounts for each of the activities within those processes. Following this are various detailed reports, including a matrix cost report that shows the originating responsibility center cost pools for each activity and process, and then finally several specific reports requested by the school's advisory board. For instance, the advisory board requested specific cost breakdowns such as isolation of special education student costs, selected faculty costs, selected parent costs, etc.

This chapter concludes with the school's advisory board's assessment of Activity-Based Costing's usefulness as a tool for organizational improvement and increased effectiveness. Some of the advisory board's managerial considerations that came under scrutiny as a result of reviewing the Activity-Based Costing output, as well as some limitations and caveats of the analysis, are also described.

Charter School Process Map: The Guiding Structure

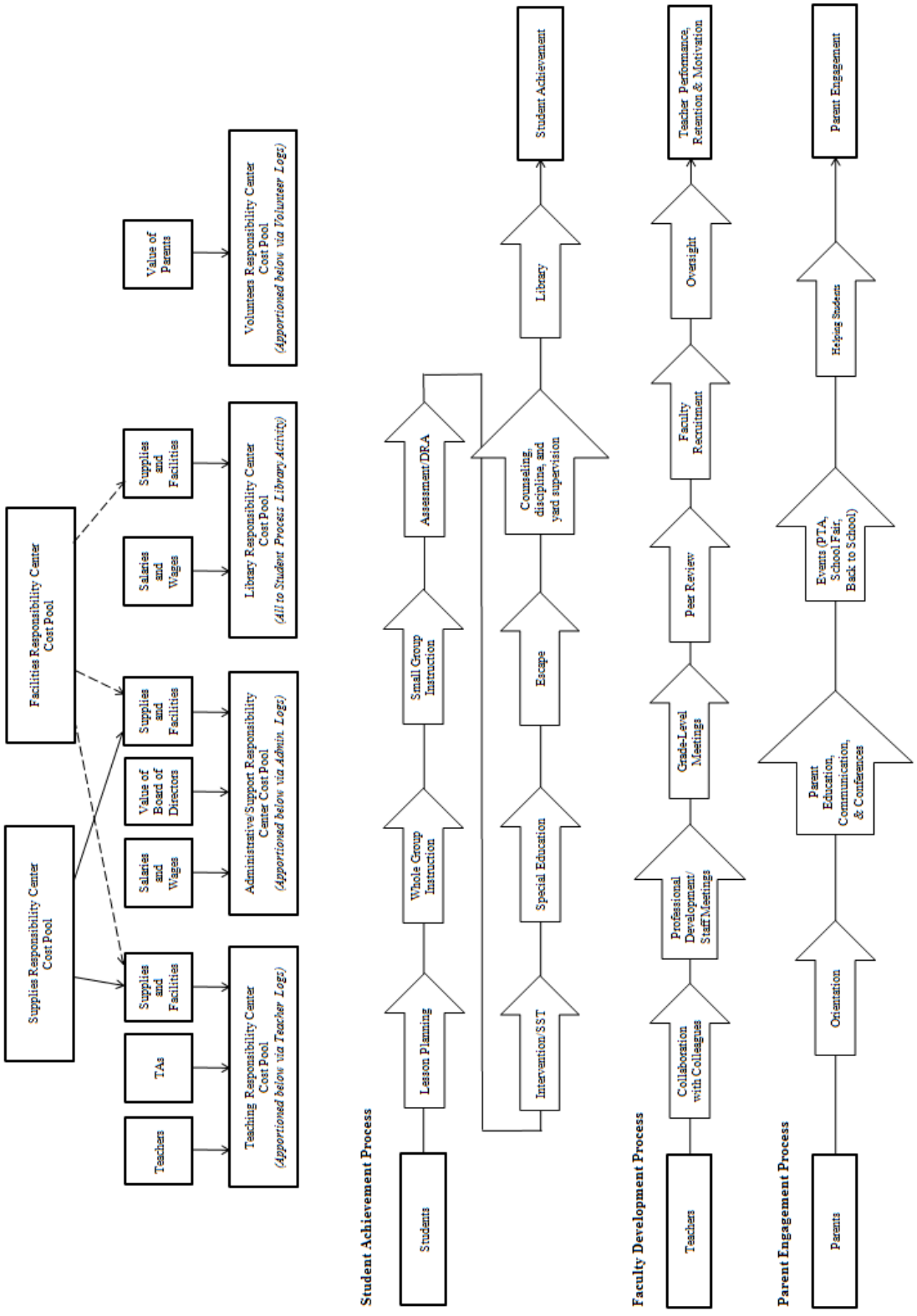
The process map presented below shows the school's organizational structure and outputs, as the advisory board defined them. It has two main sections, inputs and cost pools at the top, and three processes beneath those inputs and cost pools. (Please refer to the methodology section of this analysis for explanation of these descriptive terms.)

The school's advisory board identified six responsibility centers to serve as cost pools for its school, teaching, administrative/support, library, volunteers, supplies, and facilities. These responsibility center cost pools are represented and labeled as the larger rectangles in the upper portion of the school's process map.

Further, and also depicted in the process map, primary inputs included in several of those responsibility center cost pools were also identified; they are shown and labeled in the smaller boxes directly above the responsibility center cost pools. For instance, the main inputs identified for the teaching responsibility center cost pool were teachers, teaching assistants (TAs), supplies, and facilities. In this top section, the process map identifies and indicates the major dollar costs that will be captured and how they will be grouped into the responsibility center cost pools.

Figure 4.1

School Process Map



As can be seen from the process map and the arrows in this top section, some of the cost pools support and feed into other cost pools. For this school, the supplies and facilities responsibility center cost pools were determined to be supporting the teaching, administrative/support, and library responsibility center cost pools. This means that the collection of costs into pools was performed in a sequential manner; first dollar costs from the school's detailed financial report were categorized into five of the six responsibility center cost pools (parent volunteers' and the school's board of directors' equivalent value was added later) and, then, in a second step, two of those cost pools (supplies and facilities) were apportioned to the other responsibility center cost pools they support (teaching, administrative, and library) according to their relative support provided to each.

In summary, the school's process map served as the overall guiding structure for the Activity-Based Costing analysis. It depicts the manner in which all of the school's costs would be accumulated and grouped into responsibility center cost pools in the first step of the Activity-Based Costing analysis, and also the manner of apportionment. It also shows the destination activities for those cost apportionments from the responsibility center cost pools, and how those activities fit into the processes that lead to the school's outputs.

Detailed Definitions of Processes and Activities. The definitions of this school's three processes and activities they contain were developed between the researcher, the school's advisory board, and its teachers in an iterative fashion as described in phases two and three of the methodology section of this analysis. Below is a

listing of the definitions of each process and activity contained on this school's process map.

It is important to remember when assessing these processes and the placement of activities among them, that the Activity-Based Costing structure is management's conceptualization of its school and how the pieces fit together. The researcher allows some latitude in this regard, subject to professional boundaries of common definitions. Other sites may conceptualize their operations and structure differently, and this would change the results. For example, this school's management conceptualized grade level meetings as part of its faculty development process; another school might prefer to include it in the student achievement process. This issue is addressed in more detail in the limitations and delimitations section of this paper.

Student Achievement Process. The student achievement process included all costs identified as directly interacting with and supporting students, and contains activities from teachers and administrative personnel, plus the costs of the school's library. The output of this process was generally expressed as the cost of delivering a year or instruction to a student attending this school.

- Lesson planning activity: This is the time teachers and administrators spend preparing their lessons and planning how those lessons will be delivered to students.
- Whole group instruction activity: This is instructional time teaching lessons to an entire class of students.
- Small group instruction activity: This is instructional time teaching lessons to sub-groups of an entire class of students.

- Assessment/DRA activity: This is student assessment time administering written exams and observing student performance through other means such as oral presentations, etc. (DRA is Developmental Reading Assessment.)
- Intervention/SST activity: This is time spent on the school's after school program designed to provide additional instructional support in language arts or mathematics to students identified as needing it. (SST is Student Success Team.)
- Special education activity: This is time devoted specifically to working with the school's special education students administering instruction and assessment focused solely on special educational needs.
- Escape activity: This is time spent on the school's after-school grant-funded program designed to provide additional instructional support and extracurricular programs to students who may need or benefit from them. (The full description is Escape Academic Class).
- Counseling, discipline, and yard supervision activity: This is time spent counseling and conferring among students, teachers, and parents to understand and assist in identifying various issues particular to individual students and ensuring appropriate remediation, and time spent monitoring students during recesses, before and after school, etc.
- Library activity: This is all of the costs contained in the school's library responsibility center cost pool including the librarian, purchased books, the facility, etc.

Faculty Development Process. The faculty development process contains activities from teachers and administrative personnel determined to be supportive of teacher performance, retention, and motivation. The output of this process was generally expressed as the annual cost of recruiting, retaining, and supporting teachers, and teachers collaborating and supporting one another.

- Collaboration activity: This is time teachers and administrators spend building their teaching skills by collaborating and supporting one another in various ad-hoc groups, comparing and harmonizing instructional materials and assessment tools.
- Professional development/staff meetings activity: This is time teachers and administrators spend at conferences or in self-study to elevate their teaching knowledge and abilities, as well as formal meetings.
- Grade-level meetings activity: This is time spent at meetings designed specifically to enrich and harmonize instructional materials and methods by teachers teaching at the same grade levels.
- Peer review activity: This is time performing the various prescribed tasks teachers perform in review of one another.
- Faculty recruitment activity: This is time and other costs the school's administrative group spends in the search of and recruitment of teachers for this school.
- Oversight activity: This is time spent by administrators in their managerial function overseeing, monitoring, and directing faculty and other school personnel

Parent Engagement Process. The parent engagement process contains activities from teachers, administrative personnel, and parent volunteers determined to be supportive of parent engagement at this school. The output of this process was generally expressed as the cost of orienting new and potential parents, maintaining communication and relations with existing parents, and parental involvement in various school-related activities.

- Orientation activity: This is time spent by teachers and administrators orienting and otherwise familiarizing parents with the school's attributes and pedagogical tactics it employs, and may include potential students' parents as well as parents of students new to this school.
- Parent education, communication, and conferences activity: This is time spent by teachers and administrators in the ongoing communication with existing parents and families of students attending the school including regular meetings, parent-teacher conferences, and other impromptu communications (e.g., telephone and email).
- Events (PTA, School Fair, Back to School) activity: This is time spent by teachers and administrators organizing and conducting the schools many special events that support the school community and provide fundraising.
- Escape activity: This is time spent on the school's after-school program designed to provide additional instructional support and extracurricular programs to students who may need or benefit from them. (Note that this is identical to the Escape activity contained in the faculty development process; the parental volunteer time is separately stated because of the

express request of the school's advisory board to include all parent volunteer time in the parent engagement process).

- Helping students activity: This is time spent by administrators and parents collaborating on various student issues; for the administrators it includes time spent collaborating with and supporting parents in their children's general educational well-being; for parents it represents the volunteer hours in classrooms and other non-event-related time with students. (Although the parental component of this activity, in particular, seems more appropriately placed in the student achievement process, it was the advisory board's express request to include all parental volunteer time in the parent engagement process.)

Cost Pools; Accumulated Costs, Cost Flow, and Time Log Summaries

Figure 4.2 shows this school's costs and how the amounts were apportioned among its responsibility center cost pools in the first part of the Activity-Based Costing analysis. These are the dollar amounts associated with the cost pools in the upper section of the process map presented earlier. Here, the actual dollar amounts accumulated into each responsibility center cost pool are presented at each phase of accumulation among the pools prior to being apportioned out to activities and processes.

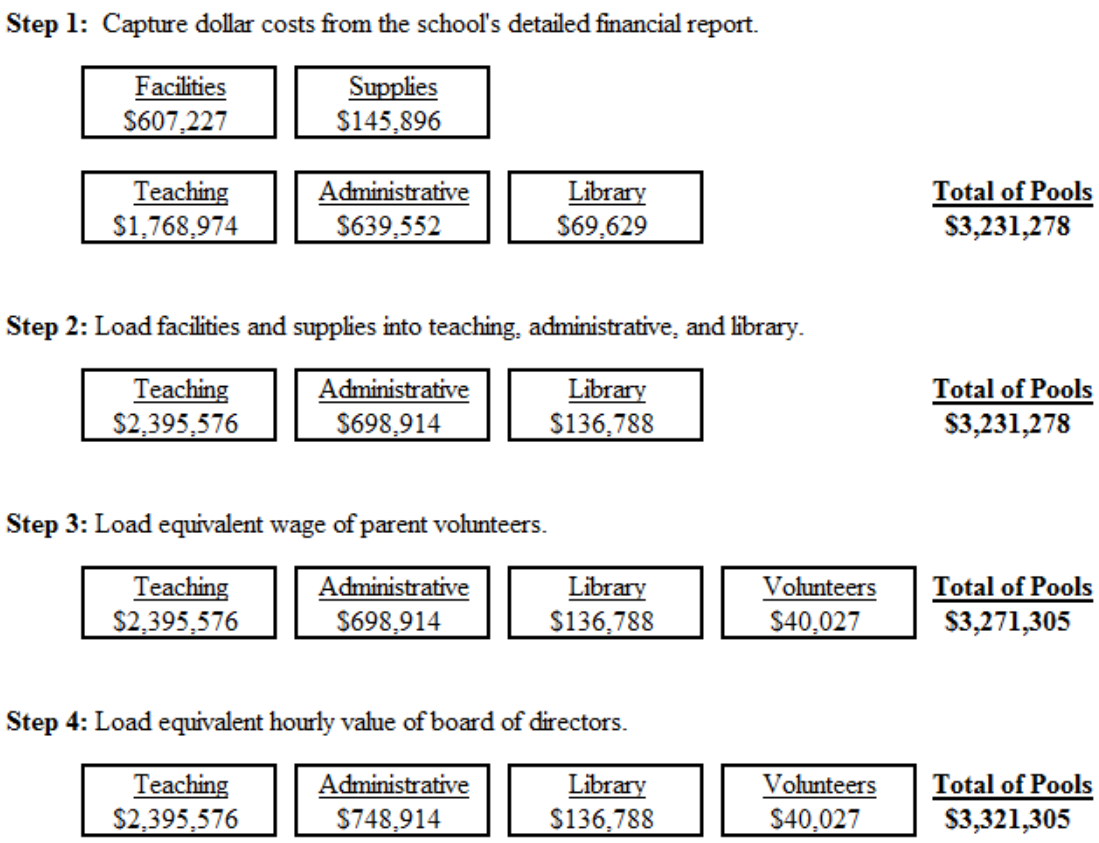
Specifically, the process map presented previously showed arrows leading from the facilities and supplies responsibility center cost pools to the teaching and administrative and library cost pools; Figure 4.2 shows the total dollar cost amounts in all of the responsibility center cost pools before and after allocation of the facilities and supplies indicated by the arrows in the process map. It then shows totals for each

responsibility center cost pool after adding the values of parent volunteers' and the school's board of directors, respectively.

Before considering the values of the school's parent volunteers and board of directors, the sum of the cost pools totaled to the same amount as the total costs shown in the school's detailed financial report prepared in the traditional accounting format. Addition of ascribed values for the volunteers' and board of directors' hours increased the total contained in the cost pools for the value they provided to the school; as a result, the final total costs captured into the cost pools exceeded the dollar amount shown on the school's traditional detailed financial report by the value ascribed to those parent volunteers and the school's board of directors.

Figure 4.2

Cost Pools and Flow of Costs from Financial Reports and Volunteers



For this school, collection of the costs into its responsibility center costs pools entailed the four steps depicted above.

The first step captured all of the costs from the school's traditional detailed income statement; dollars were assigned from the school's traditional detailed income statement into the five responsibility center cost pools shown in Step 1. Between the first and the second step was the apportionment of the supplies and facilities costs to the responsibility centers they supported; as depicted in Step 2, above, the facilities and supplies responsibility center cost pools were eliminated, because they were apportioned (loaded) into the teaching, administrative, and library responsibility center cost pools

according to the proportion of their costs applicable to each. The facilities responsibility center cost pool was apportioned based on the portion of total square footage dedicated to classrooms, the administrative offices, and the library; the supplies responsibility center cost pool was assigned based on the advisory board's judgment of the portion consumed by teaching and administrative (90% and 10% assigned to the teaching and administrative responsibility centers, respectively).

Note that the total of the pools is the same before and after eliminating the facilities and supplies responsibility cost center pools and apportioning their costs into the teaching, administrative, and library responsibility center cost pools; no additional costs were added at these steps, they merely depict the apportionment of the two supporting responsibility centers' costs into the responsibility centers they support.

The third and fourth steps reflect addition of costs ascribed to the school's volunteers (its board of directors and parent volunteers); Steps 4 and 5 show the school's total costs increasing from the total assigned from the traditional detailed income statement because the equivalent values of the school's parent volunteers and its board of directors were added (loaded), increasing the total of all pools combined at Steps 4 and 5 by the value of each as they are added. The costs from the school's traditional detailed income statement totaled $3,231,278, and were increased by $40,027 and $50,000 to a total of $3,321,305 by the addition of the equivalent values of the school's parent volunteers and its board of directors, respectively.

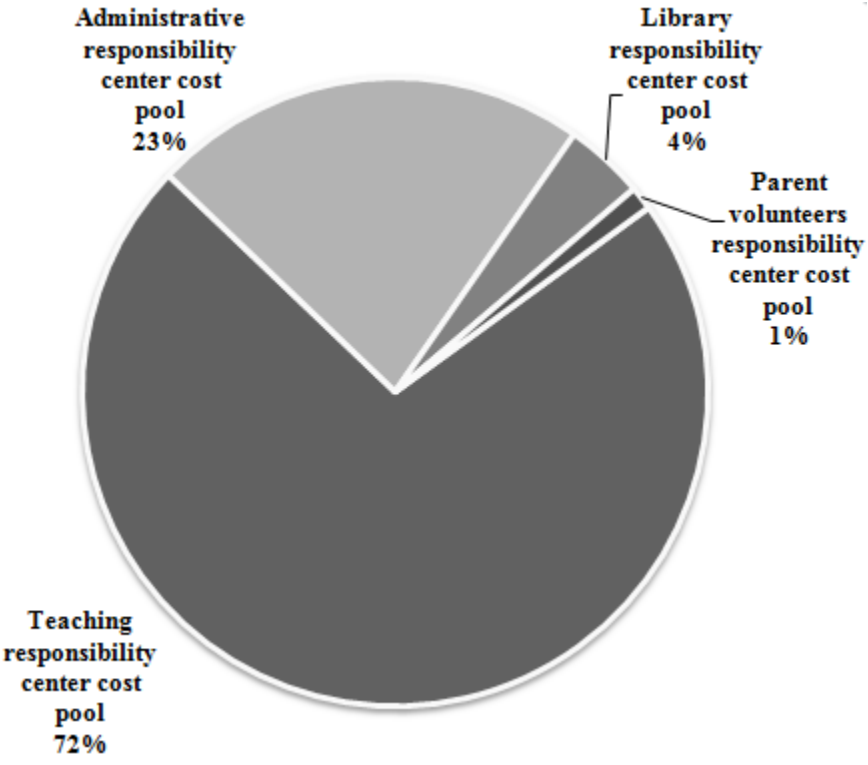
This multi-step process completed the first part of the Activity-Based Costing methodology; the costs of each of the remaining four responsibility centers were

complete (including support and volunteer costs), and ready to be assigned to the activities in each of the processes.

Figure 4.3 shows the proportionate share of the school's costs contained in each of the four responsibility center cost pools subsequent to completing the processes above and the first part of the Activity-Based Costing analysis. It shows that 72% of the school's costs are contained in the teaching responsibility center cost pool, followed by 23% in administration responsibility center cost pool, and 4% and 1% for the library and volunteers responsibility center cost pools, respectively.

Figure 4.3

Responsibility Center Cost Pool Proportions



This is an interesting result, but not unexpected; it tells us that almost three quarters of the school's resources are spent toward teaching-related responsibilities. But this is only the intermediate result, and should not be confused with the proportions

shown after the second part of the Activity-Based Costing analysis. This result shows how the dollars were collected into the pools, and that the largest pool is related to teachers and their salaries and benefits and other related costs. This pool will next be apportioned to the processes (student, teacher, and parent) based on the manner in which teachers spend their time (their activities) as reported on the time logs they completed. The other pools will be apportioned in a similar manner.

The dollar values accumulated into the primary responsibility center cost pools in the first part of the Activity-Based Costing analysis were assigned to activities in the second part of the analysis. For example, the total dollar value in the teaching responsibility center cost pool of $2,395,576 was assigned entirely to various activities contained in the school's three processes, apportioned based on how the teachers reported spending their time on their time logs. (Refer to the methodology section of this paper for a complete discussion of the methodology for apportioning the teaching responsibility center cost pool as well as all other responsibility center cost pools to activities, processes, and outputs.) Put another way, 72% of the school's costs (as depicted above in Figure 4.3) were apportioned based on teacher activities (how they spend their time as reported on the teacher time logs).

These activities to which dollars were assigned from the responsibility center cost pools are depicted by the large arrows in the processes shown in the lower portion of the process map presented earlier. As an example, portions of the $2,395,576 in the teaching responsibility center cost pool were assigned to the lesson planning activity in the student achievement process, the collaboration with colleagues activity in the faculty development process, the orientation activity in the parent engagement process, and many

more. Each line item on the time logs completed by the school's teachers was associated directly with an activity in one of the three processes shown on the process map, enabling the researcher to assign the total in the teaching responsibility center cost pool directly, and in its entirety, using the percentages of teachers' time spent on each activity. (The teacher time log is presented in Appendix 1.)

The following exhibit shows the percentage breakdown of the distribution of dollars out of the teaching responsibility center cost pool, based on the teachers' reporting of how they spend their time in a typical work week. As an example, the teachers reported, on average, that 14.9% of their time was spent doing lesson planning, an activity contained in the student achievement process. Therefore, 14.9% of the $2,395,576 contained in the teaching responsibility center cost pool was assigned to the lesson planning activity contained in the student achievement process. The remainder of the teaching responsibility center cost pool was assigned in the same manner in accordance with the percentages of how the school's teachers reported spending their time on the time logs.

Table 4.1

Time Spent on Activities and Processes per Teacher Time Logs

Student Achievement Process	%
Lesson planning	14.9%
Whole group instruction	30.6%
Small group instruction	19.5%
Assessment/DRA	9.3%
Intervention/SST	3.2%
Special education	2.1%
Escape	1.7%
Counseling, discipline, & yard supervision	1.5%
Total Student Achievement Process	**82.8%**
Faculty Development Process	
Collarboration with colleagues	4.7%
Prof. development/staff meetings	4.2%
Grade-level meetings	2.9%
Peer review	0.9%
Total Faculty Development Process	**12.6%**
Parent Engagement Process	
Orientation	0.1%
Parent education, communication, & conf.	2.9%
Events	1.4%
Total Parent Engagement Process	**4.5%**
Total	**100.0%**

Table 4.1 shows that, in total, 82.8% of the costs contained in the teaching responsibility center cost pool were assigned to activities in the student achievement process, 12.6% were assigned to activities in the faculty development process, and 4.5% were assigned to the parent engagement process.

Not surprisingly, the bulk of teacher time is taken up by instruction; it is interesting to note that the portion of that time taken by special education is relatively small; parent engagement is relatively small as well. Faculty development represents a

significant time commitment (12.6%), but a considerable portion of that is collaboration with colleagues – a category that could include some instructional aspects. The issue of activity categorization and the impacts is discussed extensively later in these results and also in the limitations and delimitations section of this paper.

The total dollar amount of $748,914 contained in the administrative/support center cost pool was assigned in the same manner as described above for teachers, based on the manner in which the school's top administrators reported spending their time in a typical work week, except that the administrative time logs contained four line entries that were not identified specifically as activities in any process on the school's process map. (The Administrative Time Log is presented in Appendix 3.) Further, one category of these four, entitled "other" represented nearly half of the total administrators' time that could not be directly assigned to an activity. This was not unexpected, and is unavoidable due to the nature of administrative and middle-management work.

Upon tabulation of the administrators' time logs, the four categories contained on the log for which no activity existed in any of the school's processes summed to 39.6% of the administrators' time. This is a normal and unavoidable circumstance due to the nature of administrators' work and, for this school, included administrative time spent on duties such as working with school finances or general communications not specifically assigned to teachers or parents.

Therefore, the researcher took the items that could be assigned directly to the activities contained in the processes (60.4%) and assigned costs from the administrative/support responsibility cost pool accordingly, and then assigned the remaining 39.6% of the costs in that responsibility center cost pool in conformity with the

60.4% that could be directly assigned. Put another way, the 39.6% of the administrative/support costs that was not directly assignable to activities was apportioned among activities in exactly the same proportions as the 60.4% that could be directly assigned, so that 100% of the administrative/support responsibility center cost pool was assigned in conformity with those directly assignable items. Possible means of eliminating or improving this apportionment of administrators' non-directly assignable time is something that could possibly be explored and improved in future research.

The following exhibit shows the percentage breakdown of the distribution of dollars out of the administrative/support responsibility center cost pool.

Table 4.2

Time Spent on Activities and Processes per Administrator Time Logs

Student Achievement Process	%
Lesson planning	8.2%
Whole group instruction	7.6%
Small group instruction	4.9%
Assessment/DRA	1.6%
Intervention/SST	9.2%
Special education	9.2%
Counseling, discipline, & yard supervision	8.3%
Total Student Achievement Process	**48.9%**
Faculty Development Process	
Collarboration with colleagues	9.4%
Prof. development/staff meetings	7.6%
Faculty recruitment	2.9%
Oversight	8.4%
Total Faculty Development Process	**28.2%**
Parent Engagement Process	
Orientation	0.9%
Parent education, communication, & conf.	10.8%
Events	2.6%
Helping students	8.6%
Total Parent Engagement Process	**22.8%**
Total	**100.0%**

Table 4.2 shows that, in total, 48.9% of the costs contained in the administrative responsibility center cost pool were assigned to activities in the student achievement process, 28.2% % were assigned to activities in the faculty development process, and 22.8% were assigned to the parent engagement process.

The large component within the student achievement process is partly due to the fact that each of the administrators has direct teaching responsibilities; it is interesting to note that the administrators' time spent on special education is considerably higher than

that spent by the teachers. It is not unexpected, however, that the administrators spend more time with parent engagement than the teachers (22.8% for administrators, versus 4.5% for the teachers). This is partly due to the weekly meetings held by administration for the specific purpose of maintaining good communication and rapport with parents.

The library responsibility center cost pool containing $136,788 was assigned in its entirety (100%) to the library activity in the student achievement process.

The volunteer responsibility center cost pool, assigned based on the parent volunteer time logs maintained by the school, was apportioned to activities contained in the parent engagement process as follows:

Table 4.3

Time Spent on Activities and Processes per Parent Volunteer Logs

Parent Engagement Process	%
Parent education, communication, & conf.	7.7%
Events	25.7%
Escape	5.4%
Helping students	61.1%
Total	**100.0%**

All of the parent volunteer time was assigned to the parent engagement process. This is counterintuitive because one would expect, for instance, helping students to naturally fit into the student achievement process. The researcher and the school's advisory board debated the placement of this activity and, due to the advisory board's strong desire to see all parent costs in the parent engagement process, the researcher proceeded accordingly.

The researcher accepted the advisory board's wishes in this instance for two reasons. First, the dollar amount in question of $24,442 was small relative to the dollars

contained in the student achievement process and, therefore, would not likely have any impact on decisions school's management might make based on non-inclusion of that amount. This dollar amount, however, reflected the majority of the parent volunteer time and therefore could have impact on decisions school management might make based on its inclusion in the parent engagement process. Second, the very essence of this Activity-Based Costing analysis is to deliver reporting in a manner that makes sense to, and is usable by, the school's management. This school's management wanted to capture clearly and completely parent engagement costs and considered all parent time at the school to be a part of the parent engagement process. The researcher's judgment was that this seemingly incongruent cost assignment was acceptable for these reasons. (Refer to related discussions regarding communication and professional judgment in the limitations and delimitations section of this analysis.)

The above apportionments and assignments of costs completed the second part of the Activity-Based Costing analysis. All costs in the responsibility center cost pools had now been assigned to activities within the processes in the lower portion of the process map, permitting accumulation of those activities' costs to arrive at total costs of each process and output (e.g., student achievement).

Summary Cost Reports

Completion of the second part of the Activity-Based Costing analysis, and assignment of all costs to processes and their activities permitted creation of the output reports that follow, showing accumulations of costs according to the processes and the activities contained in those processes, and more.

When viewing the following output cost reports, it is important to remember that the entire Activity-Based Costing model is designed specifically for the particular site, beginning with the broad determination of what should be measured. The Activity-Based Costing methodology drives the methodology and implementation, but the choice of what should be measured or how the pieces within that design should be configured is determined by site management represented by the advisory board.

The first step in formulating the site's Activity-Based Costing configuration was determination of the outputs it produces, followed by determining the activities that comprise those outputs and then how various costs should be included in each output. The choice of outputs was, therefore, fundamental to what is ultimately reported, and the reports presented below reflect this school's decisions regarding what it wanted to measure and how it wanted that measurement designed.

This school's advisory board chose three fundamental outputs directly connected to its three main constituent groups – student outcomes, faculty outcomes, and parent outcomes. Upon completing his analysis, the researcher reported back to the school's advisory board with the two summary reports presented next. These reports show cost totals for every process and activity created for this school. The researcher also reported the origination, by cost pool, of each process' and activity's total. (Many of these tables are rounded to the whole dollar to enhance readability; rounding errors should be ignored.)

Because students are the school's primary purpose for existence and also cause the vast majority of its costs, expressing school costs on a per student basis is a logical unit of measurement. Similar "logical" measurements in other industries abound; for

example, the airline industry uses passenger miles flown as its logical measurement, retailers typically use dollars per square foot of facilities. These measurements therefore have particular illustrative meaning to management in their respective industries.

More closely related to a charter school would be the unit measurement commonly used in colleges and universities – full-time equivalent student (FTES). Because college and university students may attend full or part-time, that attendance is restated to a common unit – the equivalent number of students that would be taking classes at the college or university if all were full-time. This conversion creates a common denominator that can be used for per student analysis and various comparisons such as between years, among schools, etc.

All students at this (and most) elementary schools are full-time and, therefore, no restatement is necessary to arrive at an FTES equivalent. To provide per student costs similar to that obtained at the college and university level therefore merely required using the number of students attending the school.

Table 4.4 shows the final result of the Activity-Based Costing analysis, and includes costs assigned from all of the school's responsibility center cost pools. Note that the total in this report agrees to the $3,321,305 total shown in the cost pools report presented in the previous section of these results. But this report is after the costs have been assigned out of the pools and into the activities and processes in the second part of the Activity-Based Costing methodology; and so the results are now shown according to activities and processes. Each amount is presented in total, as well as on a per student basis.

Table 4.4

Summary Cost Report by Process and Activities

Student Achievement Process	Total	Per Student
Lesson planning	$ 418,499	$ 1,206
Whole group instruction	789,391	2,275
Small group instruction	502,908	1,449
Assessment/DRA	236,112	680
Intervention/SST	145,628	420
Special Ed	119,661	345
Escape	39,900	115
Counseling, discipline, supervision	99,011	285
Library	136,788	394
Total	**2,487,898**	**7,170**
Faculty Development Process		
Collaboration	182,570	526
Prof. devel., critical friends, staff meetings.	156,306	450
Faculty recruitment	21,541	62
Grade-level teacher planning	68,814	198
Peer review	21,987	63
Oversight	62,979	181
Total	**514,197**	**1,482**
Parent Engagement Process		
Orientation	9,913	29
Parent education, communication	154,470	445
Events	64,108	185
Escape	2,181	6
Helping students	88,537	255
Total	**319,210**	**920**
Grand Total	**$ 3,321,305**	**$ 9,571**

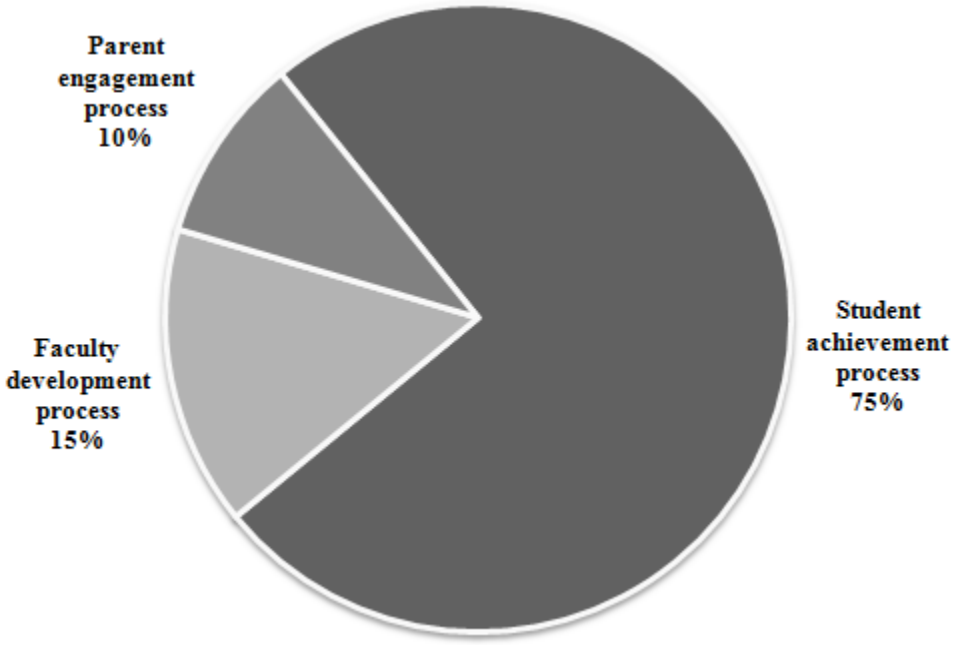
Table 4.4 shows that the total average cost per student of all school processes is almost $10,000. This total per student amount could have been derived from the traditional financial reports (total without the relatively nominal value ascribed to the volunteers' time), but the Activity-Based Costing breakdown according to what the

school produces is new. School management, presented with this previously unavailable information, might find meaningful insights.

Figure 4.4 shows these results by process, indicating that student achievement, faculty development, and parent engagement consume 75%, 15%, and 10% of the schools available resources, respectively.

Figure 4.4

School Costs Proportions According to Processes



Most of the activities in the three processes received assignments of costs from more than one responsibility center cost pool. For instance, the lesson planning activity in the student achievement process received cost assignments from both the teaching and the administrative/support responsibility cost pools. This leads to Table 4.5 which shows the costs of each activity and process according to the responsibility center cost pool from which it originated, and exemplifies the clarity and traceability of costs the Activity-Based Costing analysis provides.

Table 4.5

Summary Cost Report by Process and Activity According to Cost Pool

	Responsibility Center Cost Pool of Origin			
	Teaching	Administrative	Library	Volunteers
Student Achievement Process				
Lesson planning	$ 357,211	$ 61,288		
Whole group instruction	732,472	56,919		
Small group instruction	466,358	36,550		
Assessment/DRA	223,777	12,334		
Intervention/SST	76,966	68,662		
Special Ed	50,999	68,662		
Escape	39,900			
Counseling, discipline, supervision	36,895	62,116		
Library			$ 136,788	
Totals for Student Achievement	**1,984,578**	**366,533**	**136,788**	-
Faculty Development Process				
Collaboration	112,159	70,411		
Prof. devel., critical friends, staff mee	99,677	56,629		
Faculty recruitment		21,541		
Grade-level teacher planning	68,814			
Peer review	21,987			
Oversight		62,979		
Totals for Faculty Development	**302,636**	**211,560**	-	-
Parent Engagement Process				
Orientation	3,520	6,394		
Parent education, communication	70,528	80,845		3,098
Events	34,314	19,487		10,307
Escape				2,181
Helping students		64,096		24,442
Totals for Parent Engagement	**108,362**	**170,821**	-	**40,027**
Responsibility Center Totals	**$2,395,576**	**$ 748,914**	**$ 136,788**	**$ 40,027**

All costs accumulated into the responsibility center cost pools must be assigned to activities and accumulated into process totals to complete the second part of the Activity-Based Costing methodology. This schedule proves all costs were assigned for this school, because the totals at the bottom of this schedule sum to $3,321,305, agreeing to the total of the responsibility center cost pools presented in the previous section of these results; this is also the total of the summary cost report presented on the previous page.

Therefore, this matrix-style table clearly depicts the origin of the dollars contained in each process and activity, and permits tracing the causes of these costs, which is a primary benefit of Activity-Based Costing. (The other primary benefit is that the entire design and accumulation process is according to the entity's desires.) As an example, the lesson planning activity contained assignments of $357,211 and $61,288 from the teaching and administrative/support responsibility center cost pools, respectively, totaling to the $418.499 total cost of that activity shown on the preceding summary cost report. Put another way, the above schedule connects, in matrix fashion, the responsibility center cost pool dollar amounts (vertical summing) to the activities and processes dollar amounts (horizontal summing).

Although not shown here in an exhibit, it should be noted also that any of the responsibility center cost pool totals is also traceable to its origin. To do so would merely require tracing back through the accumulations made into that responsibility center cost pool in the first step of the Activity-Based Costing analysis. Doing so would reveal which detailed accounts from the school's traditional detailed financial reports were accumulated into that cost pool, as well as any additional values assigned for the value of the school's volunteers or board of directors. (Table 4.5 will be referred to many times later in this analysis, because it permits "zooming in" on particular costs for analysis.)

In summary, these reports present the school's cost data according to the processes and activities requested by the school's advisory board, and every number presented in these results is absolutely and specifically identifiable as to its cause and origin. Further, expressing the costs of processes and activities on a per student basis provides a relevant number that is easily understood by management. School

administrators, provided with this previously unavailable data, may determine that there are valuable insights and alter their decision-making regarding how their limited resources should be used.

Table 4.5 may be somewhat detailed for non-accountants, but nevertheless as mentioned above it provides excellent traceability of costs in each process and activity. For instance, approximately two thirds of the faculty development process costs originated from the teaching responsibility center cost pool ($302,636) and approximately two fifths originated from the administrative responsibility center cost pool ($211,560). Similar totals for the other two processes reveal their breakdowns, as well.

Table 4.6, however, reduces those proportions into an easily digestible format; each process is presented showing the proportion of costs within it according to the responsibility center cost pool from which it originated. For instance, the approximately two thirds of the faculty development process originating from the teaching responsibility center cost pool is actually 59%, and the approximately one third originating from the administrative responsibility center cost pool is actually 41%. Each of the processes is presented in similar fashion, permitting straightforward comparison of where each process' costs originate.

Table 4.6

Process Costs According to Originating Cost Pool

Student Achievement Process	Total
Teaching	80%
Administrative	15%
Library	5%
Volunteers	0%
Total	**100%**
Faculty Development Process	
Teaching	59%
Administrative	41%
Library	0%
Volunteers	0%
Total	**100%**
Parent Engagement Process	
Teaching	34%
Administrative	54%
Library	0%
Volunteers	13%
Total	**100%**

These tables reveal that the student achievement process is supported overwhelmingly by the teaching responsibility center cost pool (80%), with the remainder originating from the administrative responsibility cost center (15%) and the library (5%). This is a clear, succinct breakdown of student achievement costs afforded by the matrix table (Table 4.5). Conversely, the faculty development process has a much higher proportion coming from the administrative responsibility center cost pool (41% versus 15% for the student achievement process). These results are not counterintuitive.

The parent engagement process percentages, however, are very interesting in that they shows a much higher proportion of the total originating from the administrative responsibility center cost pool than from the teaching responsibility center cost pool (54%

administrative versus 34% teaching). This is counterintuitive and, seeing this, the school's management might want to investigate why. The answers are discoverable readily in the matrix table (Table 4.5).

Below is a small section of that matrix table (Table 4.5) that shows the relative makeup of the activities contained in the teaching and administrative components, depicting what each of those constituent groups is doing to contribute to the costs.

Table 4.7

Selected Data from Summary Cost Report According to Cost Pool

	Responsibility Center	
	Teaching	Administrative
Parent Engagement Process		
Orientation	$ 3,520	$ 6,394
Parent education, communicatior	70,528	80,845
Events	34,314	19,487
Escape	-	-
Helping students	-	64,096
	$108,362	$170,821

The data above was included in the Summary Cost Report by Process and Activity According to Cost Pool matrix report above (Table 4.5). Here, it is highlighted independently to reveal the reason the administrative costs outweigh the teaching costs as a proportion of the Parent engagement process. It shows that the primary reason is the time administrators spend collaborating with and supporting parental involvement with their children's education.

Reports Focused on Specific School Costs

In addition to the summary reports presented above, the researcher and advisory board wanted to exploit the Activity-Based Costing information to gain further understanding of key aspects of the school's operational costs. Each of the three

processes (student, teacher, and parent) was targeted for analysis, and some of the analyses focused on the costs in a process coming solely from a particular cost pool (e.g., student achievement costs originating from the teaching responsibility center cost pool, or parent costs originating from the administrative responsibility center cost pool).

Output such as this is useful to management because it helps them understand where resources went and make more informed judgments regarding how to change resource use. These focused analyses are presented next, together with a brief discussion of each, as applicable.

Student-Related Custom Reports. The output of the student achievement process was defined as the cost to deliver a year of instruction at this school (refer to definitions of processes and activities presented previously). Some analyses focused solely on activities contained in the student achievement process and were based on the number of students attending the school. Therefore, the per student numbers represent an annual cost of delivering various instructional components to the school's students. It makes sense that the advisory board would find variants of student cost reports useful, since serving students represents the school's primary purpose for existence. Two subsets of students were isolated for cost analysis, students with special needs (e.g., special education), and those with no special needs (e.g., a "regular" student).

Wanting to know the cost of delivering a year's instruction to particular student groups is analogous to management of an automobile production plant asking for variants on particular costs contained in an automobile or the relative cost of one vehicle model versus another. While it is not possible (or desirable) to eliminate some of these special costs (e.g., special education), it is possible that understanding them better can provide

managerial insights regarding how to deliver the service in a more effective or cost efficient manner.

The Cost of the Student Achievement Process for a Non-Special Needs Student. This specific report focuses on the costs of a non-special needs student. The advisory board wanted to know how much it cost to deliver instruction to a student not enrolled in its special education, Escape, or intervention/SST programs. (These are the three programs the school conducts to address students with special needs; descriptions of activities, including these programs, were presented earlier in this paper.) The advisory board was, therefore, interested in seeing the total and per student cost for a non-special needs student flowing specifically from the student achievement process. As shown below, costs of non-special needs students flowing specifically from the student achievement process totaled $6,290.23 per student (using the total student population of 347 as the basis).

Table 4.8

Student Achievement Costs for the Non-Special Needs Student

	Total	Per Student
Lesson planning	$ 418,499	$ 1,206
Whole group instruction	789,391	2,275
Small group instruction	502,908	1,449
Assessment/DRA	236,112	680
Counseling, discipline, supervision	99,011	285
Library	136,788	394
Total	**$ 2,182,709**	**$ 6,290**

Costs of Special Needs Students. Possibly one of the most interesting results flowing from this Activity-Based Costing analysis is the ability to isolate costs for subsets of students. Special programs for students requiring additional academic support

and other enrichment programs are known to be extremely costly, and the Activity-Based Costing results for this school permit separating out and expressing those special costs explicitly.

This reveals further, the flexibility of the data produced by the Activity-Based Costing analysis. Further, the costs reported are also very auditable; the composition of each is absolutely identifiable as to its origin in terms of processes (e.g., teacher, administrative), the activities within those processes that caused it, and the source of the cost in the activity (responsibility center cost pool and, ultimately, the school's traditional detailed income statement).

The per student amounts shown below for students in special programs are considerably larger than the per student amounts shown in the summary report for the school as a whole because they are calculated using the smaller number of students in each program versus the total student population at the school. Of the 347 students at this school, only 34 are special education students; dividing the total costs identified as special education costs by only 34 students results in a much higher per student costs than dividing them by 347. But a per student calculation of these special costs is more meaningful when expressed in terms of the students receiving the special services (and causing the costs).

Therefore, the researcher first started with the total cost per student at the school (presented in the first summary cost report for the school as a whole) and subtracted from that total the per student costs of each of the three special programs, yielding a total per student cost for the non-special needs student.

This is very similar to the non-special needs student calculations presented earlier, except these calculations include all of the school's costs, not just those from the student achievement process. The per student cost of a non-special needs student is $8,692, $2,402 higher than the per student cost reflected above, because it includes an additional $1,482 and $920 per student costs from the faculty development and parent engagement processes, respectfully.

The researcher therefore began with the total per student costs for a non-special needs student (including amounts from all three processes) and then separately added back those specific identifiable special needs costs (intervention/SST, special education, and Escape) based on the number of students in each program to arrive at the total cost per student for a student one of those programs. (Approximately 40% of the school's students are receiving intervention/SST, and there are 34 and 64 students receiving special education and Escape academic class services, respectively.)

The modified schedule is shown below for each of these three classes of students, and a limitations and assumptions discussion later in this paper discusses some of the issues that were revealed and highlighted in the process of deriving these specific costs. The resulting cost information, however, previously unavailable to this school's management, is very revealing.

Table 4.9

Costs of Special Needs Students

	Cost Per Student
Total cost per student, presented previously	$ 9,571
Less:	
Intervention/SST per student included above	(420)
Special ed per student included above	(345)
Escape costs per student included above	(115)
Total cost per student without special costs	**$ 8,692**
Total Cost per student without special costs	$ 8,692
Add intervention/SST costs per intervention/SST student	1,049
Total cost of an intervention/SST student	**$ 9,741**
Total cost per student without special costs	$ 8,692
Add special ed costs per special ed student	3,519
Total cost of a special ed student	**$ 12,211**
Total cost per student without special costs	$ 8,692
Add Escape costs per Escape academic class student	623
Total cost of an Escape academic class student	**$ 9,315**

The above schedule removes the costs of the three special needs classes of students at this school, intervention/SST, special education, and Escape, deriving the total per student cost without them of $8,692. Then, in three separate calculations, each of those costs is added back independently as a cost per student, using the smaller number of

students actually receiving each service as a basis, to arrive at the per student cost for each of these specific classes of student.

As these calculations show, this school's special education students are the most expensive of the three ($12,211 per special education student), followed by intervention/SST students ($9,741 per intervention/SST student), and then by Escape students ($9,315 per Escape student).

Some students are recipients of more than one of these three special programs. Therefore, calculating the total cost for one of these students would require starting with the $8,692 per student cost of the non-special needs student, and then adding the special service costs that particular student receives. Because there are three programs, the number of possible combinations is not presented here. However, to illustrate how these special costs could be utilized, Table 4.10 shows the cost of a student receiving one, two, or three selected special programs, respectively.

Table 4.10

Cumulative Cost Example for Special Needs Students

	Student with No Special Costs
Total cost per student, presented previously	$ 9,571
Less:	
Intervention/SST per student included above	(420)
Special ed per student included above	(345)
Escape costs per student included above	(115)
Total cost per student without special costs	**$ 8,692**

	Student with Special Costs		
	One Program	Two Programs	Three Programs
Total Cost per student without special costs	$ 8,692	$ 8,692	$ 8,692
Add intervention/SST costs per intervention/SST studer	1,049	1,049	1,049
Add special ed costs per special ed student		3,519	3,519
Add Escape costs per Escape academic class student			623
Total cost including each item cumulatively	**$ 9,741**	**$ 13,261**	**$ 13,884**

This schedule shows how per student costs can grow rapidly as additional services are rendered to remediate those special needs. In the example above, the $9,741 cost of a student in the intervention/SST program represents a 12% increase over the cost of a non-special needs student; the $13,884 cost of a student in all three special needs programs represents a 60% increase over the cost of a non-special needs student. It is clearly evident, based on these numbers, why so much attention is focused on these programs.

Figure 4.5

Example Special Needs Student Costs Compared to Non-Special Needs

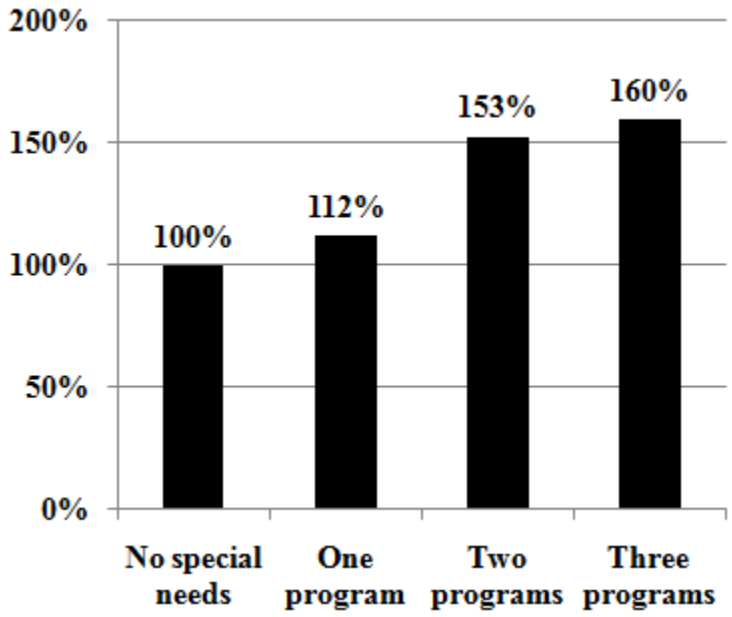


Figure 4.5 shows the relative cost increases, using a non-special needs student as a base (100%), as special programs are administered to students with special needs. It clearly depicts the rapidly rising cost per student as more programs are required.

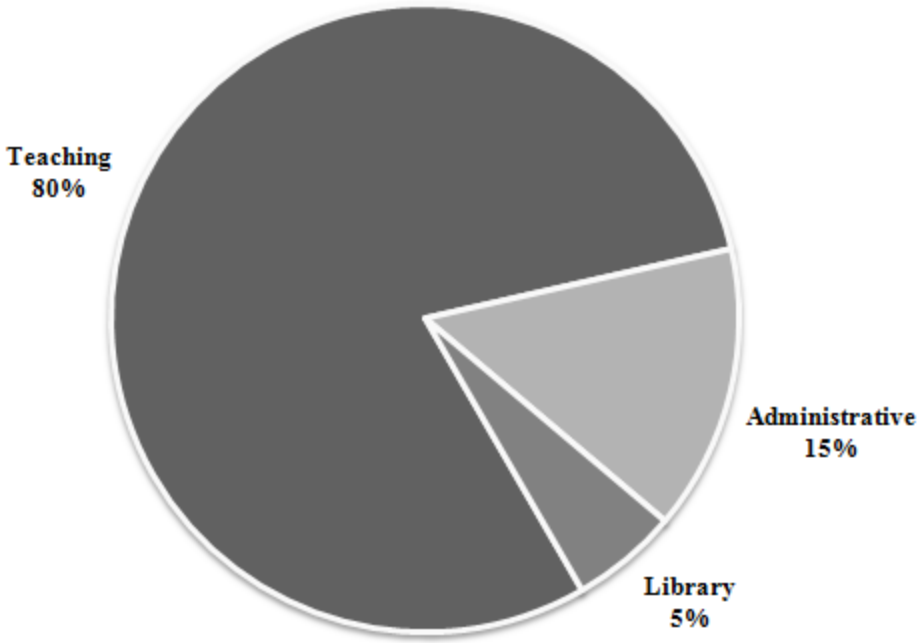
As a final comment, note that the school's Escape program had a small amount of cost in the parent engagement process as a result of parent volunteer time dedicated to that activity. This was the only activity that was duplicated in two processes, and the duplication was allowed by the researcher due to the advisory board's explicit instructions. All of the above calculations, also at the advisory board's request, specifically removed and restated only special needs program costs included in the student achievement process. The advisory group's objective in these decisions was to maintain isolation of costs coming from the student achievement process from costs ascribed to parent volunteers. Including the Escape costs from the parent engagement process in the above calculations would have increased the total cost per Escape student

by $34 from $623 to $657 per Escape student, a difference of about five percent of total Escape costs, and an immaterial difference in terms of the student achievement process costs. Further discussion of this issue accompanies the parent engagement custom reports presented below.

Additional Student Achievement Analyses. The student achievement costs originate almost entirely from the teaching and administrative responsibility center cost pools (approximately 95%). Approximately 15% of the student achievement process originates from the administrative responsibility center costs pool. Figure 4.6 shows the proportion of each responsibility center cost pool contained in the student achievement process. As can be seen, at this school it took $366,533 in administrative costs for student achievement to support approximately $2 million in student achievement costs from teaching.

Figure 4.6

Student Achievement Process According to Originating Cost Pool



The administrators' role in student achievement contained a significant supportive component, (e.g., counseling, discipline, supervision comprised almost one fifth of the administrative student achievement costs). But, as can be seen from Table 4.11, this school's administrators also take an active role in the school's instruction. Below, all of the student achievement costs originating from the administrative responsibility cost center pool are shown in total and on a per-student basis:

Table 4.11

Student Achievement Costs from Administrative Responsibility Center

Student Achievement Process	Total	Per Student
Lesson planning	$ 61,288	$ 177
Whole group instruction	56,919	164
Small group instruction	36,550	105
Assessment/DRA	12,334	36
Intervention/SST	68,662	198
Special Ed	68,662	198
Escape	-	-
Counseling, discipline, supervision	62,116	179
Library	-	-
		-
Totals for Student Achievement	**$ 366,533**	**$ 1,056**

The student achievement costs of administrators works out to $1,056 per student; but perhaps the most revealing aspect of this view is the activities that comprise this total. As can be seen, these administrators take an active role in the teaching process and a very small proportion of their student achievement costs (approximately 18%) are caused by counseling, discipline, and supervision.

This information might provide meaningful insights to this school's management for the possible reassignment of teaching duties from administrators to teachers or instructional support personnel.

Teacher-Related Custom Reports. The output of the faculty development process was defined as the annual cost of recruiting, retaining, and supporting teachers, and teachers collaborating and supporting one another. These specific analyses focused on the school's teachers, with particular interest in how much its teacher costs represented on a per teacher basis. This specific cost analysis has merit because teachers are manageable, and because developing them properly can have a meaningful impact on student performance. The following reports reflect the desire to understand the annual cost of various components of building and maintaining the school's faculty.

Returning to the automotive analogy mentioned for the student-related reports above, the school's teachers would be analogous to the tools and equipment in the automobile manufacturing plant. At a school, the teachers are the primary "equipment" since they are the main performers of the school's main mission – teaching students. Therefore, a better understanding of teachers' activities and the costs associated with those activities has the potential to provide meaningful managerial insights.

Figure 4.7 shows the top-level breakdown of teacher activities obtained from the teacher time logs, and that the vast majority of teachers' time is consumed by activities contained in the student achievement process. This is not a surprising result; nevertheless it could provide insights for managerial decisions when viewed in relation to the other processes' proportions. Management might consider, for instance, whether strengthening the parent engagement component could provide value to the school.

Figure 4.7

Composition of Teacher Activities by Process

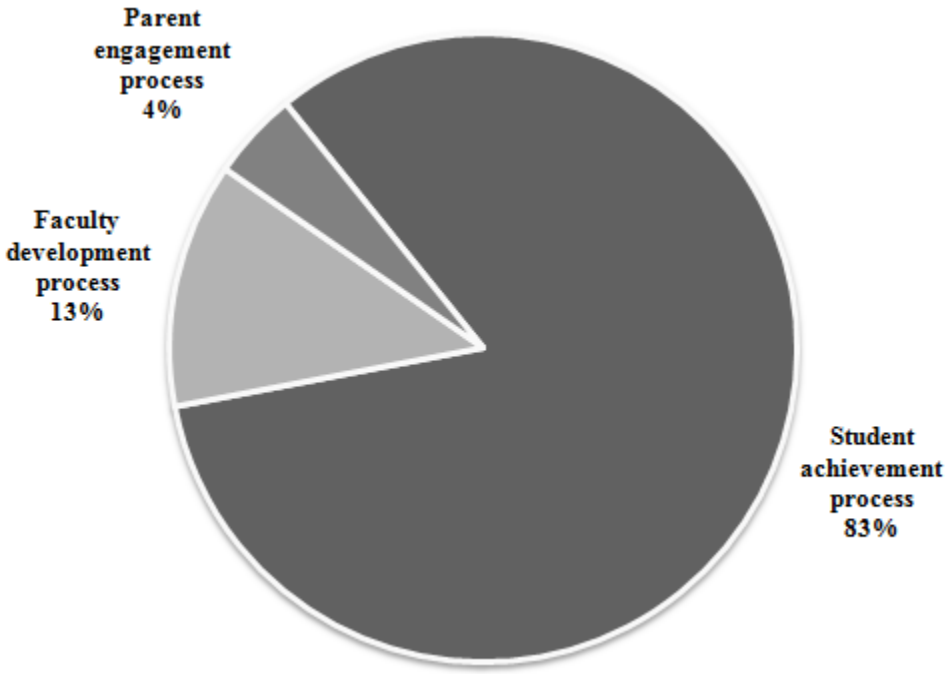


Figure 4.8 shows the breakdown of teaching activities within the student achievement process, where 83% of the teaching responsibility cost center pool was assigned to activities. About 80% of the student achievement process originates from the teaching responsibility cost center pool.

Figure 4.8

Student Achievement Process from the Teaching Responsibility Center

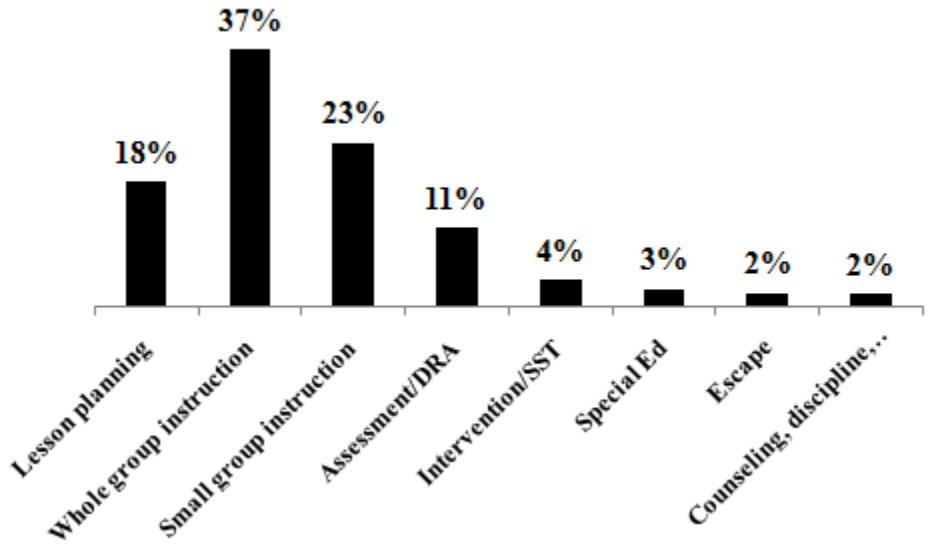


Figure 4.8 shows that almost 90% of the teachers' student achievement activities are other than special programs or counseling and discipline; a little more than a third is spent in whole group instruction and about a quarter is in small group instruction. It is unclear whether insights to school management would be as useful as insights the teachers might get by reviewing this data.

It is important to remember that the costs in the following tables include some, but not all, of the teacher salaries. The reader is reminded that the teachers' salaries and benefits were collected into the teaching responsibility center cost pool and then apportioned to activities based on how they spend their time (using the time logs they completed). This means that activities in all three of the school's processes contain some of the teachers' salaries. In traditional financial reports, it is impossible to determine the proportion of teacher compensation incurred for faculty development because of all teacher costs being included in the single salaries and benefits category.

As an example, the summary cost report for the school presented early in these results showed a total dollar cost of $156,306 for professional development, critical friends, and staff meetings. This total should not be construed as fees paid directly for professional development or direct costs paid in connection with staff meetings, however. Instead, this dollar amount represents the total cost of the teachers' time spent on this activity, including their salaries and other appurtenant teaching costs that were collected into the teaching responsibility center cost pool. Further, about one third of this particular activity originates from the administrative responsibility center cost pool; therefore, the $156,306 professional development, critical friends, staff meetings total dollar amount also includes the cost of administrative salaries and appurtenant costs dedicated to this activity.

The advisory board, therefore, is seeing what accountants frequently call a "fully loaded" cost of each of these activities; the term "fully loaded" is commonly used to describe a cost that includes all of the related components that can be identified as being caused by it. This is a unique view of costs not available to school management through traditional financial reports, and has the potential to provide meaningful insights for modifications at the school.

Selected Faculty Costs Expressed on a per Teacher Basis. One important element (and cost) at any school is that of building and maintaining faculty skills. The summary report presented at near the beginning of this results section (Table 4.4) showed total faculty development costs of $514,197, representing 15% of the total costs incurred at this school (Figure 4.4 presents these percentages). As discussed throughout this analysis, most importantly in the limitations and delimitations section, the Activity-Based

Costing methodology is a product of management's view of its operations. Considerable latitude is allowed regarding how costs are collected and reported, because the objective is to provide information that is meaningful to management. These decisions impact results.

Below are two sets of analyses to show the impact these decisions can have; specifically, they depict the impact of the choice to include collaboration and grade level teacher planning in the faculty development process rather than the student achievement process. This school's advisory board chose to include teacher collaboration and grade level planning in the faculty development process because the activities were viewed as most closely aligned with building faculty skills; another school's management might view these teacher activities as more closely supporting student achievement.

In Table 4.12, the teacher activities in the faculty development process are summarized (excluding the recruitment and oversight activities). The first calculation shows these faculty development costs inclusive of collaboration and grade level teacher planning, the second calculation shows them without those two items.

Table 4.12

Selected Faculty Costs on a per Teacher Basis

	Total	Per Teacher
Collaboration	$ 182,570	$ 10,739
Prof. devel., critical friends, staff meetir	156,306	9,194
Grade-level teacher planning	68,814	4,048
Peer review	21,987	1,293
Total	**$ 429,677**	**$ 25,275**
Prof. devel., critical friends, staff meetir	$ 156,306	$ 9,194
Peer review	21,987	1,293
Total	**$ 178,293**	**$ 10,488**

As illustrated above, removal of the collaboration and grade level teacher planning activities results in a 59% reduction of reported cost per teacher from $25,275 to $10,488 per teacher. Although school management is informed of the impact of a decision such as this, and its impact, the casual reader (such as a parent or board member) may need assistance interpreting the meaning of these reports. It is important to remember, as described elsewhere in this analysis, that the $25,275 includes an apportionment of all costs from the teaching responsibility center cost pool (teacher salaries and benefits, facilities, etc.).

Table 4.13 shows the impact of this same decision on the costs reported for the school as a whole. The first set of columns reports the costs for the school as a whole in the manner its advisory board determined appropriate for this school, and shows costs identical to the summary report (Table 4.4) which was presented earlier in these results. The right two columns restate the summary report by removing the collaboration and

grade level teacher planning activities from the faculty development process and, instead, including them in the student achievement process.

Table 4.13

Summary Cost Report before and after Moving Selected Activity Costs

	Originally Reported		Restated	
Student Achievement Process	Total	Per Student	Total	Per Student
Lesson planning	$ 418,499	$1,206	$ 418,499	$1,206
Whole group instruction	789,391	2,275	789,391	2,275
Small group instruction	502,908	1,449	502,908	1,449
Assessment/DRA	236,112	680	236,112	680
Intervention/SST	145,628	420	145,628	420
Special Ed	119,661	345	119,661	345
Escape	39,900	115	39,900	115
Counseling, discipline, supervision	99,011	285	99,011	285
Library	136,788	394	136,788	394
Collaboration	-----	---	182,570	10,739
Grade-level teacher planning	-----	---	68,814	4,048
Total	**2,487,898**	**7,170**	**2,739,282**	**21,957**
	75%		**82%**	
Faculty Development Process		Per Teacher		Per Teacher
Collaboration	182,570	10,739	-----	---
Prof. devel., critical friends, staff meetings.	156,306	9,194	156,306	9,194
Faculty recruitment	21,541	1,267	21,541	1,267
Grade-level teacher planning	68,814	4,048	-----	---
Peer review	21,987	1,293	21,987	1,293
Oversight	62,979	3,705	62,979	3,705
Total	**514,197**	**30,247**	**262,813**	**15,460**
	15%		**8%**	
Parent Engagement Process				
Orientation	9,913		9,913	
Parent education, communication	154,470		154,470	
Events	64,108		64,108	
Escape	2,181		2,181	
Helping students	88,537		88,537	
Total	**319,210**		**319,210**	
	10%		**10%**	
Grand Total	**$3,321,305**		**$3,321,305**	
	100%		**100%**	

Table 4.13 shows that moving the collaboration and grade level teacher planning activities from the faculty development process to the student achievement process cuts

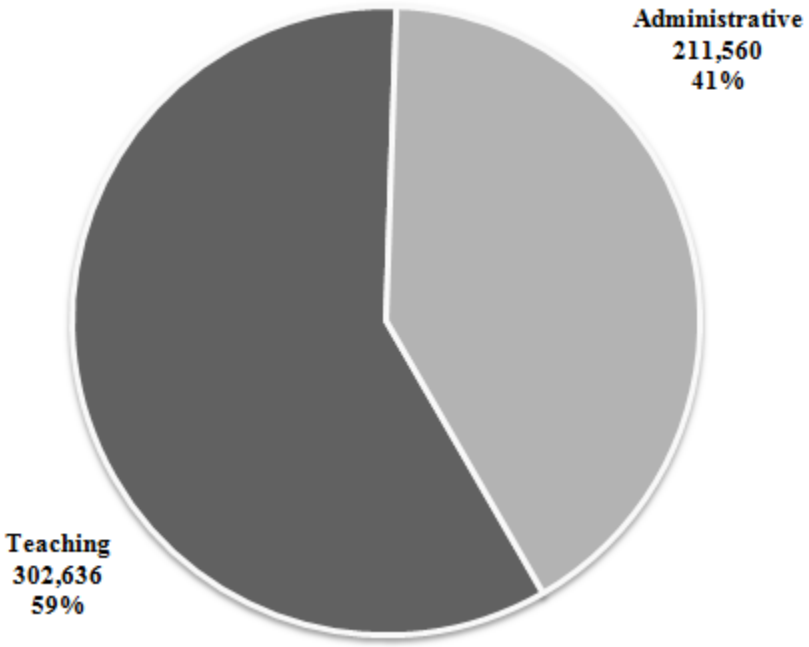
total faculty development costs by nearly half (from 15% down to 8% of total school costs), and increases student achievement costs nearly ten percent over what it was (from 75% to 82% of total school costs). Some might say that teacher development costs are overstated and that student achievement costs are understated in the originally reported numbers (left two columns). But the Activity-Based methodology's essence is to provide insights to management by developing and reporting costs in a manner it wants and understands; and this school's management made many clear decisions such as the one detailed above.

The summary data as initially reported (left two columns) certainly has potential to provide meaningful insights to the school's management; it shows and summarizes the school's activities and processes in the manner that management prescribed. However, it is equally important to ensure management understanding of how its choices impact those results. This understanding further boosts the potential that meaningful insights can be gained. (Refer to the limitations and delimitations section for more discussion on the impact of decisions such as these, and the communication and professional judgment required to make them properly.)

Additional Faculty Development Analysis. The faculty development costs originate mostly from the teaching responsibility center cost pool, but a significant portion also comes from the administrative responsibility center cost pool. Figure 4.9 shows the proportion of each responsibility center cost pool contained in the faculty development process. As depicted in Figure 4.9, at this school faculty development costs were comprised about 59% and 41% from the teaching and administrative responsibility center cost pools, respectively.

Figure 4.9

Faculty Development Process According to Originating Cost Pool



But, as can be seen from Table 4.14, the activities performed for faculty development by the school's teachers and administrators differ considerably. Below, all of the faculty development costs originating each of the two pools comprising it are detailed by activity.

Table 4.14

Composition of Faculty Development Process by Pool and Activity

Faculty Development Process	Teaching	Administrative
Collaboration	$ 112,159	$ 70,411
Prof. devel., critical friends, staff meetings	99,677	56,629
Faculty recruitment	-	21,541
Grade-level teacher planning	68,814	-
Peer review	21,987	-
Oversight	-	62,979
Totals for Faculty Development	**$ 302,636**	**$ 211,560**

It is interesting to see that the activities performed by teachers versus the administrators toward faculty development differ considerably. This is not a surprising result; for instance, the administrators' role in faculty recruitment and oversight would not be expected in the teacher activities. Nevertheless, school management might find meaningful insights in the composition of other line items above such as the collaboration or professional development activities that could lead to managerial decisions for modification.

Parent-Related Custom Reports. The output of the parent engagement process was generally defined as the annual cost of orienting new and potential parents, maintaining communication and relations with existing parents, and parental involvement in various school-related activities. Parent involvement is important because it helps to ensure the school's educational objectives and methods are understood by the parents; and that understanding can have a positive impact on the environment a student faces upon leaving the school and going home.

Table 4.15

Parent Engagement Costs of Teachers and Administrators

Parent Engagement Process	Total
Teachers	$ 108,362
Administrators	170,821
Total	**$ 279,183**

Table 4.15 summarizes the parent engagement costs attributed to teachers and administrators. These amounts are taken from the Summary Cost Report by Process and Activity According to Cost Pool (Table 4.5), and represent about 8.4% of the schools total costs of $3,321,305, a significant investment.

The desire for cost output pertaining to parent engagement reflects a need to understand better the cost of maintaining good collaboration and communication with students' parents, and selected results are presented on a per family as well as a per administrator basis. Although parents are not manageable, per se, good communication and relationships with them have value to the school; therefore a clear understanding of the relative costs of each parent related activity could provide useful managerial insights.

Total Cost of Parent Engagement per Family. Table 4.16 shows the entire parent engagement process from all responsibility center cost pools in total and expressed on a per family basis (this total is larger than the one shown in Table 4.15 because it includes the $40,027 value ascribed to parent volunteers from the volunteers responsibility center cost pool). This schedule takes the entire parent engagement process costs and its component activities and expresses them on a per family basis using the 261 families who had children attending the school.

Table 4.16

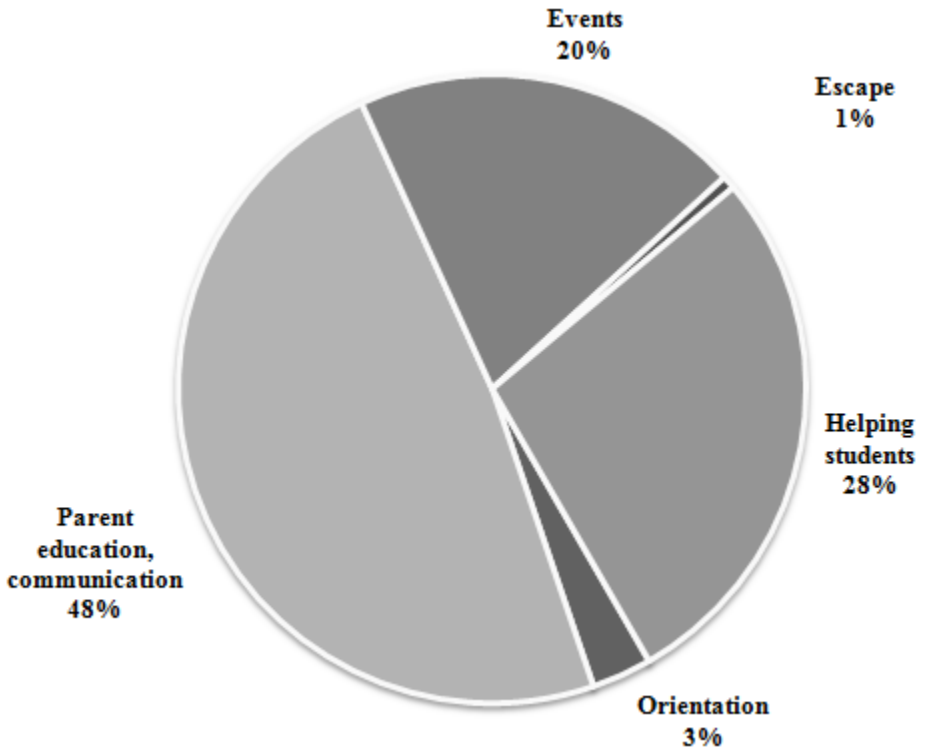
Total Cost of Parent Engagement per Family

Parent Engagement Process	Total	Per Family
Orientation	$ 9,913	$ 38
Parent education, communication	154,470	592
Events	64,108	246
Escape	2,181	8
Helping students	88,537	339
Total	**$ 319,210**	**$ 1,223**

The school's total costs of the parent engagement process, including the amount ascribed to the parent volunteer hours, resulted in a total cost per family of $1,223. Almost half of this total comes from parent education and communication; about a quarter of the total comes from events. Figure 4.10 depicts the exact proportions each parent engagement activity represents to the total.

Figure 4.10

Composition of Parent Engagement Activities



It is interesting to see the per family amounts in Table 4.16, but possibly even more interesting to see the proportion each parent-related activity represents to the total of all parent activities. Management, seeing its relative efforts spent in the specific activities might find insights that could assist in redirecting its resources among those activities.

Parent Engagement Costs Incurred by Teachers. In another example of the flexibility and transparency Activity-Based Costing provides, management can select costs of specific activities or processes based on their origin. As described earlier, each process is a collection of activities, and those activities typically contain costs from multiple responsibility center cost pools. One of the summary reports presented early in

these results showed each of this school's activities broken down into components based on the responsibility center cost pool of origin (Table 4.5). For instance, the the lesson planning activity was shown to contain assignments of $357,211 and $61,288 from the teaching and administrative/support responsibility center cost pools, respectively. This means a request for costs based on their originating responsibility center cost pool is easy to accommodate.

The following report focuses on parent engagement process costs. Specifically, it details the costs contained in the parent engagement process that originated from the teaching responsibility center cost pool, and also how much those costs represented on a per teacher basis. It is reasonable to expect management to wonder how much it costs for its teachers to serve parent needs, given the size of teaching costs, and the importance of teacher/parent communication and collaboration to student success.

As presented earlier in these results, teachers spend a little over 5% of their time on parent engagement. Of that, most is parent education and communication, and about a third is connected with school events. The following shows the dollar value of each of the teacher activities contained in the parent engagement process.

Table 4.17

Parent Engagement Costs Incurred by Teachers

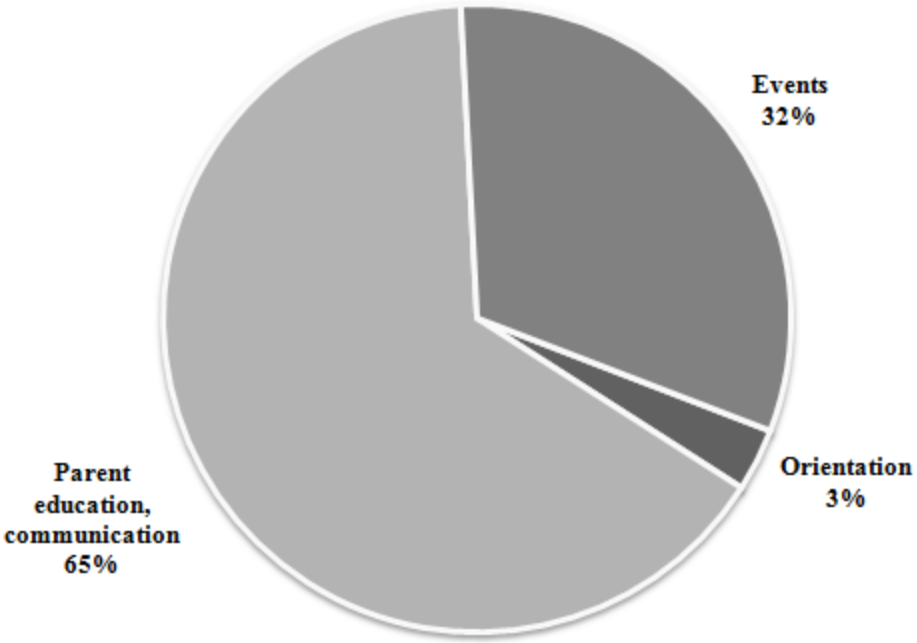
Parent Engagement Process	Total	Per Teacher
Orientation	$ 3,520	$ 207
Parent education, communication	70,528	4,149
Events	34,314	2,018
Escape	-	-
Helping students	-	-
Total	**$ 108,362**	**$ 6,374**

This schedule shows that teaching costs assigned to the parent engagement process totaled $108,362 and that those costs equaled $6,374 on average, for each of the school's 17 teachers.

Figure 4.11 depicts the amounts shown above in percentage format, showing the proportionate breakdown of teachers' parent engagement time for this school.

Figure 4.11

Composition of Parent Engagement Activities by Teachers

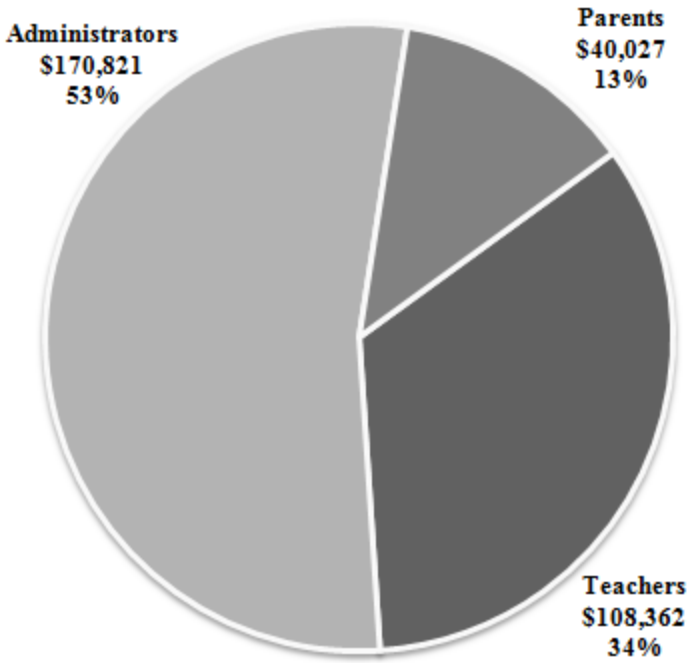


Approximately two thirds of teachers' parent engagement activities are in the parent education and communication activity at a cost of $70,528, and about one third is dedicated to events at a cost of $34,314. School management might find meaningful insights in this data; for instance, seeing that only 3% of teachers' parent engagement time is directed to orientation, management might consider the relative benefit that might flow from increasing orientation activities.

Parent Engagement Costs Incurred by Administrators. As presented earlier in this report (Table 4.7), parent engagement costs incurred by administrators is considerably higher than incurred by teachers. Figure 4.12 shows the relative breakdown of the parent engagement process according to originating responsibility center cost pool.

Figure 4.12

Parent Engagement Costs According to Originating Cost Pool



The parent engagement costs coming from the administrative responsibility center cost pool are detailed below. The researcher noted the advisory board consisted of the school's four top administrators, but in this specific request, the number of administrators was specified as six. This reflected a desire to include the front office personnel in the calculations due to their heavy involvement with parents.

Table 4.18

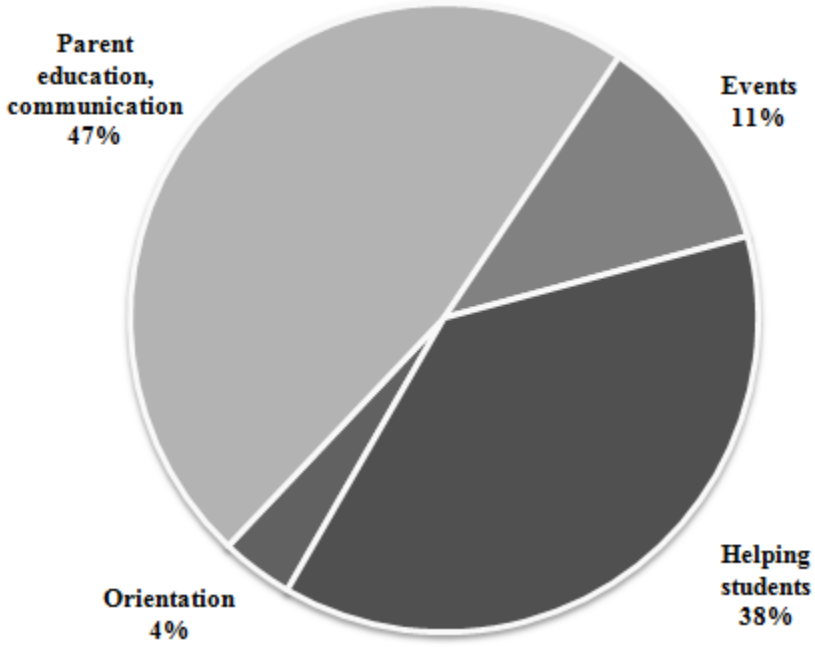
Parent Engagement Costs Incurred by Administrators

Parent Engagement Process	Total	Per Six Administrators
Orientation	$ 6,394	$ 1,066
Parent education, communication	80,845	13,474
Events	19,487	3,248
Escape	-	-
Helping students	64,096	10,683
Total	**$ 170,821**	**$ 28,470**

These selected administrative/support costs contained in the parent engagement process totaled $170,821, representing $28,470 per administrator (on a six administrator basis). Figure 4.13 shows the proportionate breakdown of administrative activities contained in the parent engagement process.

Figure 4.13

Composition of Parent Engagement Activities by Administrators



This has potential to provide meaningful insights to the school's management as it seeks to more effectively communicate with its parent constituency. For instance, as mentioned earlier, management might question whether dedicating additional resources to orientation could offset and reduce requirements for parent engagement in other activities.

Advisory Board Reactions, Comments, and Assessments

This was a pilot project to determine whether Activity-Based Costing could be used to identify and measure effectively a charter school's services produced, activities performed to produce those services, and accurately trace their costs. If those things could be done, and the accurate cost information could be produced, the next question

was whether that cost information could provide meaningful insights leading to more efficient allocation of the charter school's limited resources.

The results above are output measurements of this school's services produced, and include the activities performed to produce them, complete with absolute traceability of all dollar amounts to their source (e.g., activities performed, who performed them, and originating cost records from traditional financial reports).

Three debriefing meetings were held with the school's advisory board for presentation and review of the Activity-Based Costing results and also to permit and facilitate the advisory board's understanding of the actual Activity-Based Costing structure developed for its school. In addition to providing the reports presented above, the researcher brought to these meetings all of his supporting data contained on various Excel spreadsheets. All of the data in the spreadsheets is linked together. Therefore, in the course of these meetings any questions regarding the source of a particular number or what it did or did not include was readily traceable and available to be projected on a large screen and described to the advisory board as they presented questions to the researcher.

For instance, one member of the advisory board inquired regarding which accounts from the school's detailed financial report were included in the library responsibility cost center pool. In less than a minute, this question was answered in the affirmative that, a particular account from the school's traditional detailed income statement containing the cost of books purchased for the library was properly included in the library responsibility cost center pool. Several other queries were posed, and answered promptly and precisely in this manner.

At the same time they were presenting queries to the researcher, the advisory board members also discussed among themselves various details contained on several of the reports presented, making comments that clearly indicated possible decision-making was taking place based on the Activity-Based Costing data. For example, a couple of particular costs in the administrative process were singled out and a discussion among advisory board members ensued regarding whether it would be advantageous to replace a departed administrative assistant to assist with those functions, since it was evident that doing so would relieve these higher-paid (and presumably higher-skilled) administrators to work on more productive tasks. In another example, while looking at the percentage of time teachers spend on various activities versus the administrators, two activities were singled out as potential candidates for modification and a shift from one group to the other (e.g., from administrators to teachers).

Throughout these meetings, it was evident that the advisory board was making a substantial number of evaluative judgments and considering possible changes to various manageable components of its school based on what it saw from the Activity-Based Costing analysis.

Teacher and Administrator Time Logs. It was clear that one of the most useful outputs for the advisory board was the time usage data that came from the teacher and administrative time logs. These were presented earlier in Tables 4.1 and 4.2 and discussed independently, and are presented again side-by-side below, to facilitate reader understanding of some of the advisory board's comments (this side by side presentation was also provided to the advisory board).

Table 4.19

Comparative View of Teacher and Administrator Time Usage

Student Achievement Process	Teacher %	Admin %
Lesson planning	14.9%	8.2%
Whole group instruction	30.6%	7.6%
Small group instruction	19.5%	4.9%
Assessment/DRA	9.3%	1.6%
Intervention/SST	3.2%	9.2%
Special education	2.1%	9.2%
Escape	1.7%	
Counseling, discipline, & yard supervision	1.5%	8.3%
Total Student Achievement Process	**82.8%**	**48.9%**
Faculty Development Process		
Collarboration with colleagues	4.7%	9.4%
Prof. development/staff meetings	4.2%	7.6%
Grade-level meetings	2.9%	
Peer review	0.9%	
Faculty recruitment		2.9%
Oversight		8.4%
Total Faculty Development Process	**12.6%**	**28.2%**
Parent Engagement Process		
Orientation	0.1%	0.9%
Parent education, communication, & conf.	2.9%	10.8%
Events	1.4%	2.6%
Helping students		8.6%
Total Parent Engagement Process	**4.5%**	**22.8%**
Total	**100.0%**	**100.0%**

Each of the administrators at this school teaches classes or special programs, and therefore seeing that over 20% of administrator time was taken for lesson planning and instruction was accepted as a good thing. However, the last line in the student achievement process, counseling, discipline, and supervision, caused a discussion that the teachers should be more involved in it and the administrators less involved in it. The remark “teacher numbers are really low” was made.

As noted earlier in these results, the placement of collaboration and professional development in the faculty process rather than the student achievement process was confirmed; this is primarily "knowledge transfer" according to the advisory board, and the time commitment to it was considered to be appropriate. The advisory board made it clear that this school is managed in a collaborative manner, with the teachers respected as decision-makers and stakeholders. The large portion of teacher time devoted to faculty development, and the large component of that entailing collaboration among teachers, was viewed as a necessary cost and desirable commitment of efforts. The remark, "this is what shared decision making costs" was made. Further, the advisory board noted that this school has no teachers' union, and no salary schedule, and pointed at the high level of satisfaction among its faculty resulting from this shared management as the reason.

Lastly, the advisory board noted that future teacher time logs should also contain a helping students line item to capture the amount of time teachers spend with parents regarding student work requirements and other issues. They remained adamant that all parent-related activities should be a part of the parent engagement process, as well. Further discussion of potential changes to the time logs are discussed in the conclusions and recommendations section of this paper.

Cost Pool Totals and Costs of Processes. The advisory board assessed the breakdown of costs among the three processes (see Figure 4.4) as reasonably balanced, showing 75% of the schools costs dedicated to student achievement; the sources of costs in the student achievement process were also considered appropriate, showing 80% from the teaching responsibility center cost pool (see Figure 4.6). Figure 4.7, however, showing the composition of teacher activities by process, caused some concern. The

advisory board believed that the parent engagement process component, at 4% of total teacher time, was too low.

Figure 4.8, showing the breakdown of teacher time within the student achievement process caused discussion regarding possible organizational changes; this figure highlighted that only 9% of teacher time was dedicated to the school's three programs for students with special needs (Intervention/SST, Special Education, and Escape). Similar to the thoughts on lack of teacher involvement in counseling, discipline, and supervision, the advisory board believed more teacher time should be devoted to these special programs.

The fact that the costs contained in the faculty development process originated relatively equally from the teaching (59%) and administrative (41%) responsibility center cost pools (see Figure 4.9) was viewed very favorably. Returning to its collaborative management style discussion, the advisory board reiterated that this school is not managed in a "top-down" manner and that, therefore, seeing a significant faculty-driven component in the total costs of the faculty development process was extremely positive and desirable.

Summation of Advisory Board Assessments, and Usefulness of Data. In many ways, the Activity-Based Costing output delivered what the advisory board expected. The vast majority of costs were incurred by teachers, the vast majority of teacher time was dedicated to instruction, and a significant commitment of time and costs was spent toward collaborative management and teacher development. These results were all perceived as being congruent with the school's mission and methodology of achieving that mission.

Ironically, however, the above-mentioned predominance of teacher time and costs dedicated to teaching also caused consternation. This consternation flowed from the depiction that teaching was too dominant in teacher time, to the exclusion of other important needs. The low portion of teacher time dedicated to special programs, counseling, supervision, and parent engagement were seen as requiring remediation. The advisory board made it clear that there would be a "high-level meeting" among administrators and teachers to address this issue, quickly adding that it would be approached in a collaborative manner in conformity with the respect teacher input is given throughout organizational decisions. The advisory board expects this will stimulate a discussion on better ways to manage student achievement and behavior.

At the time of this writing, further detailed data from the Activity-Based Costing analysis is still being provided to this school's management on request, and the expectation is that this researcher will join its board of directors, and also fine-tune and roll-forward the Activity-Based Costing analysis into the subsequent fiscal year, permitting year-over-year comparisons.

Summary

The Activity-Based Costing output yielded considerable information for this charter school's management. The summaries of costs and focused analyses presented above represent a transparency of costs not previously available to a school. Several managerial insights and a handful of initiatives aimed at improving this school have resulted from the data yielded by the Activity-Based Costing analysis. The next section of this study recapitulates the study and then presents several implications and possibilities for extending the Activity-Based Costing methodology further.

Chapter 5: Discussion and Conclusions

This chapter begins with a brief overview of this study, including the problem, purpose statement, and research questions. Next, the methodology is reviewed, and major results and findings are presented in the context of answering the research questions. Following that is an interpretation and integration of the findings, culminating with its implications and recommendations for possible future research.

Summary of the Study

Problem Statement and Purpose of the Study. Due to the manner in which traditional accounting systems and financial reporting are structured, schools lack meaningful management information depicting the true costs of the services they produce. A better understanding of what schools' services cost and how they consume their resources to produce those services is needed so schools can make better managerial decisions. A charter school was chosen for this study because charter schools have more managerial flexibility than traditional schools, plus charter schools have the stand-alone financial records traditional schools lack; each of these attributes is a necessary prerequisite to create an Activity-Based Costing analysis and achieve benefit from it.

The purpose of this study was to determine if Activity-Based Costing could reveal accurate costs of the services produced at a charter school and, if it could do so, whether the provided information could produce managerial insights at the school that might lead to operational improvements. Activity-Based Costing is a different manner of analyzing and reporting costs; it connects costs directly to the services produced, with complete traceability to the activities, individuals, and other elements that cause those costs. As documented in the literature review of this paper, Activity-Based Costing has been shown

to enhance visibility of business processes and cost structures and support improved performance (Jipyo, 2009), and those positive outcomes have even been successfully achieved in several not-for-profit venues such as cities (Mullins & Zorn, 1999), the U.S. Government (Kaplan & Kooper, 1998), and numerous others. No studies could be found, however, in which Activity-Based Costing was applied to a public school.

Specifically, in this study the school's top management determined the relevant outputs it wanted to measure, and then the cost structure was designed to capture the processes and activities that produced those identified outputs. It is this direct connection of inputs and their costs to the services produced that had potential to provide managerial information that could lead to meaningful insights for improvement.

Research Questions. This study attempted to answer two fundamental research questions.

The first research question inquired whether it would be possible to build the Activity-Based Costing model for a charter school. Specifically, can Activity-Based Costing at a charter elementary school identify measurable services, and the activities and processes that produce those services, and then trace their costs accurately?

The second question inquired about the relevance and value of the Activity-Based Costing output. Could the information produced provide meaningful managerial insights that might lead to more efficient allocation of school resources that might help support student achievement?

Method. An action research/grounded theory approach was used to develop the Activity-Based Costing methodology for this school. Through interviews with and observations of administrators and teachers, a process map was diagrammed depicting the

manner in which the school's inputs are consumed to produce its outputs (see Figure 4.1). Then the most recent available traditional financial data was accumulated and conformed to the new structure, producing cost information with traceability to the elements that caused the school's costs. (This required using the school's most recent closed fiscal year since that was the latest financial information available. See limitations and delimitations for issues related to this aspect of the analysis.)

These methods were executed in six steps.

1. Identify the school's outputs and the processes that create the outputs through interviews with top school administrators; determine the major responsibility centers (e.g., teaching) that would serve as collection pools for the costs prior to assignment to outputs.
2. Identify the activities within the processes through expanded interviews with the school's administrators and interviews and observations of a representative sample of teachers at the school.
3. Finalize the Activity-Based Costing process map and its component cost pools, activities, and processes (see Figure 4.1). Develop time logs to be used for collection of data through further interviews with administrators and follow-up with teachers.
4. Collect the detailed data needed for production of the Activity-Based Costing model, including existing financial records, volunteer activities, and time usage data from all of the school's teachers and top administrators; organize that data into the Activity-Based Costing structure.

5. Calculate the school's costs using the Activity-Based Costing structure, including costs per activity, process, and units of service. Produce cost reports depicting the school's costs in the Activity-Based Costing format, with the traceability to all of the inputs and causes of those costs.
6. Analyze, assess, and debrief the Activity-Based Costing results with top school administrators to determine if meaningful insights were provided and, if so, how those insights might be used to redirect school resources toward improvement.

Results. Each of the research questions was answered in the affirmative. The Activity-Based Costing model was successfully built and many reports were created using it; management's review of the Activity-Based Costing output produced insights that stimulated several change initiatives in pursuit of operational improvement at the school.

Specifically, as detailed in the results section of this analysis, this charter school's major processes and their component activities were identified, and costs were successfully categorized into logical cost pools and assigned to activities and processes (see Figure 4.1). Several summary reports were produced depicting the cost of producing the school's services in total (e.g., cost to provide a year's instruction to a student – Table 4.4). Several detailed analyses were also developed to focus on selected processes and activities comprising the school's operations that might be most useful to its management (e.g., cost of a student in special programs – Tables 4.9 and 4.10).

The school's management reported that the results of the Activity-Based Costing analysis were insightful and useful. For instance, at the first debriefing meeting with the

school's advisory board, decision-making immediately ensued regarding the advisability of hiring an additional person in the administrative offices, what other activities might be freed up for other administrators as a result, and whether that would be more efficient than the present circumstance. In another example, the resources consumed by special education students came under scrutiny; the reports depicted a considerably higher proportion of special education activities from administrators than teachers, and management determined that further investigation and discussions with teachers regarding this should be pursued.

Discussion and Analysis

The literature review of Activity-Based Costing revealed its usefulness to management in industry (Jipyo, 2009) and in non-profit and public sectors (Geiger, 1993/1994); yet existing traditional reporting in schools lacks the precision needed for administrators to understand how their activities drive performance (Guthrie, 2007). Charter schools possess requisite flexibility and autonomy permitting managerial decisions that would not be possible at traditional schools (Geske et al., 1997), and efficient allocation of school resources can positively impact student achievement (Archibald, 2006).

Limitations and Delimitations. The degree to which this analysis and its results can be generalized to other charter elementary schools is unclear. As stated previously, each charter school is unique in its purpose and stated mission, and unique also in its attributes resulting from its geographic location such as its socio-economic environment and the students it serves. Charter schools also enjoy considerable flexibility in many management decisions including hiring and selection of pedagogy. Charters' flexibility

is one of their major professed benefits, and this is documented extensively in the literature review presented in this paper.

This very flexibility afforded by the charter system is, however, also a significant limitation preventing generalization of the model developed in this study to other charter schools, because each charter school's organizational characteristics will follow its needs (or perceived needs) making charter schools less homogeneous than traditional schools. Therefore, the model developed and tailored to this school's structure will not fit appropriately to other charter schools. As an example, this school's dual-language immersion attribute surely affects its operations in several areas, most obviously the teachers it selects and the special programs it undertakes for its students. That prevents the model developed for this school from being applied to non-dual-language immersion charter schools because significant operational (and reporting) segments will differ between them.

Even another charter school in a similar environment and with a similar mission would likely differ from this one due to individual tendencies between the management styles at the two schools. So the very attribute (flexibility in management) that makes charter schools a prime target to test the benefits of the Activity-Based Costing analysis also prevents its duplication to other charter schools.

Nevertheless, despite the lack of transferability of this school's developed model to other charter schools, there remains the prospect that the Activity-Based Costing method itself can be applied elsewhere. The researcher has learned plenty about the inner-workings of a charter school and that knowledge would result in quicker and more adept development of another model tailored to the needs of another charter school.

Another possible limitation pertains to the manner and technique in developing the Activity-Based Costing model itself. Decisions were made regarding what the responsibility center cost pools should be, what they contain, the directional flow of how the dollar costs would be assigned from one responsibility cost center pool to another or to activities within the processes, what methods and measures would be used to assign activities from responsibility center cost pools to activities, how those activities would be organized among and within the processes, and even what the processes would be and how many of them were determined to exist. These decisions, made at every step of the Activity-Based Costing analysis, affect results significantly, and each represents a component of the resulting Activity-Based Costing model's individuality to a specific site.

The use of time logs to assign dollars out of the teaching and administrative responsibility center cost pools is another limiting factor for two reasons. The first reason is the mismatch of years between the financial data and the time logs creates potential for inaccuracies; the financial data came from the most recent closed fiscal year (the prior year), but the time logs were best estimates by the school's teachers and administrators at the time they were completed (the present year). To the extent circumstances changed between the two years, time log results might not be congruent with the financial data. The researcher attempted to address this as fully as possible, questioning administrators and also the teachers who were interviewed regarding changes from the previous year to the current year; all reported that the two years were substantially the same with regard to activities performed. The second reason is that the time logs requested teachers' and administrators' best estimates of their activities in a

typical week. Potential for misstatement is inherent in this methodology; however, no better data exists.

Another issue related to the time logs in this particular study was the component of administrative time not directly assignable to activities within one of the processes. As described in the results section pertaining to these logs, the nature of administrative work – multitasking, multiple minute-long tasks, and supporting functions administrators performed represent a block of their time that cannot be directly assignable to activities. In this study, nearly 40% of administrators' time was not directly assignable and had to be apportioned according to the portion of their time that was directly assignable. Costs may be assigned inaccurately as a result.

Even the manner of presenting the results can affect their amounts, and therefore their meaning, significantly. The researcher's presentation of the cost of one of this school's special education students is an excellent example; the cost of the special education student was first presented as the researcher understood the costs pertaining to those students (resulting in a cost of $16,609 per special education student); then, upon further consultation with the school's advisory board, the manner of presentation was redesigned and a significantly different answer was derived ($12,211 per special education student). A large difference in reported costs resulted from a mere change in the interpretation of what should or should not be included in deriving those costs.

This raises another very important limitation of the Activity-Based Costing analysis. It is crucial that the school's management and advisory board possess strong business acumen and the ability to understand the model; it is equally as critical that the researcher understand the attributes of the school and data being studied. Both parties

must be adept with these understandings, and the communication must be clear between them. If there is a breakdown anywhere in this linkage, gross errors in the model's structural design, output, and the interpretations of that output will likely result.

Related to this last stated limitation is the use of judgment on the part of the researcher. In certain circumstances, it is important that the researcher use accounting expertise to intervene with additive potential uses of the model and its data, as was done with the derivation of selected student subgroups' costs, such as the special education students. In this instance, the researcher contrived a manner of deriving a cost per special education student that flowed from his intimate understanding of the model and his accounting seasoning. It was, nevertheless, inaccurate, due to the researcher's misunderstanding of the composition of the amounts being used and their operational meaning to the school's advisory board. It required multiple discussions and iterations of reports to correct and remedy this inaccuracy, entailing rich communication of understandings between the researcher and advisory board members, resulting in a similar schedule reflecting more appropriately and accurately what management needed. It should be noted, however, that once this study has been replicated at several charter schools, cost norms will emerge diminishing the number and extent of possible variations in output based solely on judgment at a particular school.

In another instance relating to the number of administrators to be used in specific reports, however, it was evident to the researcher that intervention to ensure appropriate output was not required. Restated more succinctly, professional judgment regarding which issues to unpack and study carefully and which issues are benign and can be passed and accepted from a professional judgment standpoint is key to balancing

efficiency and accuracy when implementing the Activity-Based Costing analysis. But even with good knowledge, acumen, effort, understanding, and communication, the decisions made regarding design and reporting will nevertheless affect the output, rendering the results of the Activity-Based Costing an approximation of the truth. But even an approximate understanding has more potential to be usable for decision-making than no understanding at all. For example, compared to one large traditional financial accounting category "certificated salaries" into which all teachers' pay is lumped, the numerous categories and breakdowns afforded by Activity-Based Costing represent a giant step forward, even if imprecise.

But because the Activity-Based Costing model is developed based primarily on interviews of management, it is a perceived model of the school's processes and the components of those processes. The activities, processes, and even the outputs are all developed through iterative interviews with management and teachers as well as observations and, therefore, there is no evidence that the perceived model is, in fact the actual model of the school's processes and outputs.

Additionally, a fundamental assumption of the Activity-Based Costing model is that the inputs of what the school produces are separable, additive, and identifiable, and that those inputs can be meaningfully and accurately assembled into the school's outputs. This assumption derives from Activity-Based Costing's origin in manufacturing operations, wherein components of an end product are tangible. The intangible attributes of services (e.g., the outputs of a school), renders identifying and separating inputs a much more subjective endeavor. As an example, it is possible to identify the engine, tires, and other components of an automobile with certainty; the same positive, exacting

identification cannot be accomplished for the output of teachers' time spent on instruction.

It is also possible that additional significant outputs exist for this school other than those identified in this study. For example, student achievement was identified as the sole outcome related to students; but there might be additional significant student outcomes not identified in this study. If an additional student output were included in the model, the costs of the existing identified student output would decrease as costs were redistributed between two student outputs instead of one. While it is acknowledged that there are many possible student outcomes that could be measured (e.g., improved health, how many students enter and/or graduate from college, etc.), as the number of outputs measured increased, it would become increasingly more difficult and perhaps impossible to accurately separate the inputs among them.

This model is also not sophisticated enough to connect a dollar increase in costs to, for instance, a specific number of points gained on standardized student tests; although a relationship is assumed to exist (e.g., more costs/inputs applied to students increases their test scores), there is no means to connect the specific variability of an input to specific variability of an output in the Activity-Based Costing methodology. As stated earlier, this model was an approximation based on management's vision of its school; and it measured outputs that are defined broadly enough to permit a reasonable level of accuracy in connecting costed inputs to the limited number of broadly defined outputs.

One caveat regarding Activity-Based Costing's output: Although potentially useful to the school's management for decision-making and allocation of its scarce

resources in search of efficiencies and improvement, the Activity-Based Costing data can be problematic if it falls into the wrong hands. For instance, a parent, seeing that Activity-Based Costing shows this school spends $156,306 in the narrow faculty development activity of professional development, critical friends, and staff meetings may, in their lack of understanding of how that number was derived, demand that these funds be redirected toward hiring one or two more teachers and reducing class size. So the same data that has potential to support better understanding of operational costs, improved efficiency, and increased output when utilized appropriately can also be very damaging and an impediment to progress if misinterpreted and used improperly.

Implications for This Charter School. This study delivered summary and detailed cost reports to a charter school's management. These reports were comprehensible to this school's management because they were designed according to its own vision of how its school is structured. In addition, the information in the reports was auditable; all amounts reported were traceable to their causes (activities and cost pools). Presented with this information, this school's management immediately began to consider possible changes to its operations in search of efficiencies or improved effectiveness.

It is beyond the scope or time-frame of this study to determine exactly the changes made by this school's management using the information provided by Activity-Based Costing; a longitudinal multi-year analysis at this school is one possible strand for future study. However, it is evident based on management's reaction and decision-making discussions upon viewing the Activity-Based Costing reports that they saw value in the data provided.

This school's management found several resource allocation items it wanted to address based on the information in the Activity-Based Costing reports. Not surprisingly, the most notable among these related to how the school's teachers spend their time. As a result, individual teachers' strengths and weaknesses will be reviewed in combination with their relative time usage on particular activities (reflected in each individual teacher's time log) in an attempt to gain meaningful insights and reveal best practices on what works and what does not work in the classroom. The time log results by activity for each teacher have been provided to this school's management. This will facilitate analysis and comparison of how each teacher uses his or her time with other available data such as student test scores; management wants to determine if any patterns can be found that connect particular time usage with student performance differentials.

The relative effort of administrators versus teachers dedicated to specific activities (e.g., special education) will also be reviewed, and responsibilities may be shifted between the two groups as a result. Data collection revealed that this school's teachers have low involvement in counseling, special education, and parental communication compared to its administrators, and management indicated a "high-level discussion" would be forthcoming in which administrators and teachers would collaboratively address this.

As a caveat to its discussion with teachers on time reallocation, however, is the researcher's and school management's recognition that the measurement tools (teacher logs) likely need further refinement. For instance, teachers delivering instruction are also assessing student learning "on the fly" – listening and watching to glean cues from students regarding their understanding of material as they teach. Therefore, it follows

that some assessment is likely embedded in the two instructional activities contained in the student achievement process and on the teacher logs (whole group instruction, and small group instruction). Connected to this, it is also possible that additional attention paid to students with special needs is included in these two categories, as opposed to time shown as dedicated solely to the special education activity.

The time logs used in this study requested that each respondent report their time usage of a typical week; it is possible that this very methodology obscures subtleties in teacher time usage and precludes attaining this level of precision, however. The "typical week" time log methodology and the level of generality it necessitates also means the results, while far more specific than no results at all, should not be interpreted as being more precise than they are. A live log might be more valid, but would be very time consuming and, therefore, possibly impracticable to implement.

Further research is required to determine the extent of possible overlap or mixing of activities that could diminish the accuracy of the time log results. For instance, a method of determining how much assessment or additional time helping special education students is embedded in whole group instruction should be pursued; this very well may change the appearance that teachers at this school spend very little time with special education needs.

This school's administrator time surveys present another area of potential further study and possible refinement. In this study, nearly 40% of the administrators' time was not directly assignable to activities because it was spent performing supportive duties such as financial, communications, or various other tasks. Further investigation into possible ways to connect some of this time directly to activities within one of the

processes could reduce the amount of administrator time that must be apportioned because it cannot be directly assigned to an activity. For instance, 17% of administrators' time in this study was classified to "other." Further specific identification of items included in this category could increase the specific assignments and reduce the apportioned amount.

Since these two areas (teachers' and administrators' time) together represented the basis for apportioning 95% of this school's total costs (see Figure 4.3), even minor changes resulting from refinement of data collection could result in material changes to reporting output. However, efforts to further refine in this manner require professional judgment. There is a possibility that attempts to specifically identify that which is not specifically identifiable could result in misstatements anyway. Put another way, additional study could reveal that further refinement and specific identification of administrators' time would increase accuracy; conversely, attempts to further refine administrators' time when it is impossible to do so might merely replace one measurement weakness with another equally weak measurement problem – categorization error. Nevertheless, the 39.6% of this school's administrators' time that was reapportioned to directly assignable activities represented approximately 4.5% of the school's total costs; therefore, it is a significant enough amount to warrant further investigation.

Implementation at Other Charter Schools. This school's Activity-Based Costing structure cannot be directly implemented at another charter school because it is the unique conception of this particular school's operations according to its management. Because the Activity-Based Costing methodology entails a custom adaptation to each

entity, an outside consultant cannot merely come in and impose a predetermined Activity-Based Costing model on any school. Implementation at any particular site will require substantial engagement and commitment of time by both the researcher and the school's management to develop an accurate costing model for that site. This will require researcher understanding of that school's unique attributes, including its external environment, stated mission, and managerial style; each of these things will impact the unique Activity-Based Costing model.

The methodology of building the Activity-Based Costing model itself, however, has excellent promise for implementation at other charter schools. Outputs, processes, and activities would differ from school to school, but the method for determining them, building the process map, and restating costs into this format from the traditional reports can be easily replicated.

Implementation at any charter school will also require considerable attention to joining the professional judgment of the researcher with that school management's intimate knowledge of its site ensure the best possible model configuration and the highest degree of accuracy and meaningfulness in the output reports. Data collection methods require careful attention as well. In particular, the time logs for teachers and administrators that are used to apportion the majority of a school's costs must be carefully developed and adapted to each site; activities must be carefully chosen and clear understanding of those activities by the log respondents must be ensured.

It follows, from the above, that excellent communication between the researcher and any charter school's management is critical to ensuring the researcher understands the site, and that the site's management understands the Activity-Based Costing process

and output. Communication inefficiencies will cause structural errors in the Activity-Based Costing design, and resultant errors in output reports. Professional judgment on the part of the researcher and good administrative acumen on the part of the school's management are necessary prerequisites to effective communication and accurate costing structure as well.

Finally, if, as was done in this study, the time logs are completed in the present time but the financial records are from the latest (previous) closed fiscal year, that one year time lag between the closed year of the financial results and the present year reporting on the time logs must be carefully monitored to ensure comparability between the two years. This structural weakness, however, could be ameliorated by improvements in school's existing reporting systems; this is discussed more completely in the next section.

Broader Implications for Practice and Future Research. This study produced meaningful insights for this charter school's management. Managerial accounting methodologies and perceiving a school as a business enterprise are not typically part of traditional educators' worldview. But, in the case of charter schools, the students' parents can "vote with their feet," choosing whether or not to send their children to any particular charter school (or not).

This element of choice, not generally present in traditional schools, whose students are assigned based on geographic borderlines, means charter schools must attract students to survive; it is possible for a charter school to "go out of business" if it is not successful in attracting a sufficient number of students with its programs. The resulting advent of charter schools' more competitive and businesslike approach to running a

school is, therefore, fertile ground for a new breed of educational leader with a keen sense of urgency to gain operational efficiencies through a more businesslike approach. (The researcher observed this businesslike attitude in this school's management personnel.)

The number of charter schools is growing, and their continuing proliferation increases the likelihood that an Activity-Based Costing model will be useful. According to its management, this school's average per student funding provided by the state is approximately $7,000 per year. But reports developed in this analysis showed a per-student cost to run this school of $9,571 annually. This differential between costs and state funding illustrates the need for charter schools' entrepreneurial activities in search of supplemental funding. The cost build-up Activity-Based Costing provides, with its clarity of what causes those costs, could prove useful in arguing for increased state funding. Or, Activity-Based Costing analysis may help strengthen proposals for foundation investments.

For example, additional studies with Activity-Based Costing might support more credible arguments for changes to state funding for special needs students. It has been commonly accepted that it costs more to serve students with special needs, but no specific quantifications of how much more they cost were revealed in the literature review for this study. However, as presented in these results, the incremental cost of a special education student at this school was $3,519 over that of a non-special needs student (see Tables 4.9 and 4.10); corroborating data such as this from other school sites could provide a powerful, previously unavailable, argument for changes to education funding mechanisms. It is even possible that time studies at traditional schools could

provide meaningful insights regarding incremental costs for students with special needs, although the lack of the independent financial records at traditional schools would diminish accuracy and require the use of estimated costs.

It is this researcher's opinion, however, that the most promising avenue for future research is to implement Activity-Based Costing in a more automated data processing environment, monitoring its input parameters and reviewing output reports monthly in conjunction with other normal accounting procedures. Charter schools that have upgraded to more advanced data processing systems could provide excellent venues for adaptation of an Activity-Based Costing study in real-time.

The charter school used for this study has decided to migrate its financial data from relatively simplistic and static QuickBooks and spreadsheet reporting to a database-driven accounting system. Movement toward these facilities (typically known as "enterprise software") is well underway in the for-profit realm; these systems continuously link input data and reporting that had previously been discrete and separate from one another. For instance, in a manufacturing entity, production capacity and planning is continuously and automatically linked to projected sales, revealing mismatches such as insufficient production to support those expected sales.

In a school, this linkage has the potential to greatly enhance Activity-Based Costing's relevance by permitting more frequent updating and monitoring of time usage (how personnel spend their time each month – a critical component to Activity-Based Costing in educational venues), and disaggregating a year's data into monthly data. For example, teachers might complete a time log at the end of each month that the software could use to apportion costs to activities and processes, automating the reporting output

and conforming it to a particular month's activities. This would produce more accurate and up-to-date apportionments of costs out of the teaching responsibility center cost pool.

If cost pools, their apportionment, and the reporting attributes can be integrated structurally as an additional layer of financial reporting software already in use at a site, the Activity-Based Costing methodology could become a normal component of monthly compilation and reporting. Doing this would not only embed Activity-Based Costing into the normal reporting culture of the school, it would also permit review and modification of the reporting structure itself "on the fly" each month as management reviewed and made judgments regarding the output.

Equally beneficial would be the elimination of the time lag that existed in this study between the closed year that was used for the financial data and the present year that was used for the time log data. This would further elevate the likelihood of increased reporting accuracy. Lastly, comparison of operational results on a monthly basis would reveal more timely managerial insights, increasing the possibility for corrective actions when they can do the most good.

Concluding Remarks. Accurate cost data can provide meaningful insights for managerial action. Having data available to management on a more real-time basis enhances its potential for usefulness further. These are fundamental managerial accounting truisms. Implementing Activity-Based Costing provides previously unavailable information charter school management can use; Embedding Activity-Based Costing into existing reporting facilities could increase the data's usefulness further.

This study showed Activity-Based Costing could be implemented and provide meaningful managerial insights at a charter school. Taken as a whole, many of the

results were in accordance with what was already known – such as the majority of teacher time being instruction-related, or that a special education student costs considerably more than a non-special needs student. But although these results were not unexpected, the fact that this study provided specific dollar costs and showed those costs' exact origin was new. This school's management knew special education was expensive, but now they have an identifiable incremental dollar amount of that additional expense, and they can see exactly where that cost originates, tracing it to teachers, administrators, or other inputs. This specificity has never been previously available in a public school.

The potential for student benefit through better management of schools is the greatest possible outcome that can result. This might come from better funding if further research can show financial needs more clearly and defensibly, or it might come merely from better resource allocation at the school level because of the insights provided to a school's management.

This implementation of Activity-Based costing at an educational facility merely represents one more example in which a paradigm with proven success in the for-profit world has been productively conformed and implemented to derive similar benefits in a not-for-profit venue. As automated information systems evolve and more are adapted to charter schools, the potential for Activity-Based Costing's usefulness should increase considerably.

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Appendix 1: Teacher Interview Protocol

The two-page interview protocol used for interviewing the purposefully selected sample of teachers is presented below:

Elementary School Teacher Interview Protocol

1. Tell me about how you decided to pursue a career as an elementary teacher.
    a. Do you think you have more impact on students than you could in any other capacity? Why or why not?
2. Teaching elementary school is difficult, I know. There are countless interruptions coming from all directions. Can you maintain focus on *your* agenda in the midst of this? If so, how?
    a. What things on your agenda usually get usurped?
    b. How do you think the level of your impact on student learning is affected by the interruptions?

    Now I'm going to ask you some questions about your typical day so I can get an idea of how you all spend your time. My ultimate objective is to categorize those activities into meaningful groupings so we can get a better understanding of how your time is consumed. This will serve as the foundation for the survey of all teachers at MLC.
3. Let's talk about your typical day and what it contains. Please walk me through a normal day so I can take some notes on it.
    a. If we had to rank these activities for their relative impact on student learning, how would you rank them?
    b. Can we assign percentages of the day or quantify the hours for each activity?
4. I want to categorize your activities so I can organize them together with other teachers at MLC. Please suggest four or five general categories you think would be appropriate such as "instruction" or "extracurricular."
    a. Describe your perception of what activities the [category name] would include for you *(do for each category agreed upon)*.
5. What additional activities do you wish you could accomplish that you are not accomplishing now?
    a. In which of our categories would you place the new activities you describe?

b. How would you assess the new activities' relative impact on student learning compared to those we already identified?

6. How do you think your principal perceives your allocation of time?

    a. If not the same as you perceive it, why not?

(Note: The below questions are for triangulation; will get principal to talk about teachers, vice-versa, and reconcile.)

7. Let's talk about a typical day for your principal and what *that* contains. Please walk me through your perception of *her* normal day so I can take some notes on that.

    a. If we had to rank *these* activities for their relative impact on student learning, how would you rank them? Why?

    b. Can we assign percentages of the day or quantify the hours for each activity?

8. Please help me categorize these activities into the same categories as we did for yours.

    a. Are there additional modifications you would make to the categories we determined when we were working with your day given the teachers' activities we have listed? What would they be?

        i. *(for any new activity)* Describe your perception of the specific activities category [new category] would include.

9. We're almost done. Thank you. After all of this, what general suggestions or other thoughts do you want to give to me?

    a. What do you think my best course of action or inquiry would be to pursue your ideas/suggestions?

10. Last question. I need a general description of your school for my records. Would you describe it for me in your own words?
    a. How would you describe the environmental setting of this school (e.g., urban, suburban, etc?)

    b. How would you describe the student demographics?

    c. How would you describe the parents?

11. Are there any other things you want to share with me or questions you think I could have asked?

Appendix 2: Teacher Time Log

The two-page time log used to determine how this school's teachers spend their time is presented below:

Multicultural Learning Center Teacher Time Usage Survey

In connection with a doctoral course at CSUN, I am collecting information about teachers, how many hours they work, and how those hours are used. Your Executive Director, Toby Bornstein, has approved this survey which is part of my dissertation focused on determining how school effectiveness might be improved.

*This survey should require about ten minutes to complete. Please feel free to contact me at **818.865.8818** or **drew@profdrew.com** with any questions. Thank you for participating!*

1. Are you: Male ____ Female ____
2. How many years have you been teaching? ____
3. What grade do you teach now? (if more than one, mark all grades taught)

   K____ 1st____ 2nd____ 3rd____ 4th____ 5th____ 6th____ 7th____ 8th____

   If middle-school, which subjects? _____
4. How many years have you been teaching this grade (or these exact grades)? ____
5. How many students are registered in your class this year? ____
6. Are you employed: Full-time ____ Half-time ____ Other _____
7. What is your education level? (check all that apply)

   Bachelor's ____ Master's ____ Doctoral ____ Other _____
8. Do you have any support personnel in the classroom? Yes ____ No ____
9. If yes, what is the purpose of that support (special needs student, paper correction, etc.)?

   _____

   _____
10. If you do have support personnel, how many hours per week?

    0 – 5 ____ 6 – 10 ____ 11 – 15 ____ 16 – 20 ____ More ____

MLC administration supplemental time usage queries in addition to those on next page (hours in these two questions are independent inquiries completely apart from breakdown on next page).

1. *How many hours do you spend with art activities in a normal week?* _____ *hrs*

The section below asks about how you use your time. While there is no "typical" day for a teacher due to scheduling, weather, various interruptions, and because teachers multi-task, please try to **approximate your time usage for a typical week**. *If you need to convert from an annual number of hours, please use a 40 week year (e.g., 80 hrs/yr would be shown below as 2 hrs/wk).*

Total hours in a typical week _____ **hrs**

Breakdown of Total Hours Shown Above
(please be sure hours below add exactly to the total above)

Activities for Student Achievement

- Lesson planning _____ hrs
- Whole group instruction _____ hrs
- Small group instruction _____ hrs
- Assessment (includes DRA) _____ hrs
- Intervention/SST _____ hrs
- Special education _____ hrs
- Escape _____ hrs
- Counseling _____ hrs

Activities for Faculty Development

- Collaboration with colleagues _____ hrs
- Professional development/Staff meetings _____ hrs
- Grade-level meetings _____ hrs
- Peer review _____ hrs

Activities Relating to Parents

- Orientation _____ hrs
- Parent education, communication, and conferences _____ hrs
- Events (PTA, School Fair, Back to School) _____ hrs

Can I help you? Contact me anytime: [contact information deleted]

Appendix 3: Administrative Time Log

The two-page time log used to determine how this school's administrators spend their time is presented below:

Multicultural Learning Center Administrative Time Usage Survey

In connection with a doctoral course at CSUN, I am collecting information about administrators, how many hours they work, and how those hours are used. Your Executive Director, Toby Bornstein, has approved this survey which is part of my dissertation focused on determining how school effectiveness might be improved.

This survey should require about ten minutes to complete. Please feel free to contact me at 818.865.8818 or ***drew@profdrew.com*** with any questions. *Thank you for participating!*

1. Are you: Male ____ Female ____
2. How many years have you been doing this or similar work? ____
3. What is your present job title? _____
4. Are you employed:

   Full-time ____ Half-time ____ Other (please state) _____

5. What is your education level? (check all that apply)

   Bachelor's ____ Master's ____ Doctoral ____ Other _____

Supplemental time usage queries in addition to those on next page (hours in these two questions are independent inquiries completely apart from breakdown on next page).

1. *How many hours do you spend with art activities in a normal week?* _____ *hrs*
2. *How many hours do you spend supporting learning activities using technology in a normal week?* _____ *hrs*

The section on the following page asks about how you use your time. While there is no "typical" day for an administrator due to scheduling, various interruptions, and multi-tasking, please try to **approximate your time usage for a typical week**. *If you need to convert from an annual number of hours, please use a 40 week year (e.g., 80 hrs/yr would be shown below as 2 hrs/wk).*

Can I help you? Contact me anytime: [contact information deleted]

Total hours in a typical week *(should equal the total of hours shown below)* _____**hrs**

Activities for Student Achievement

- Lesson planning _____ hrs
- Classroom core instruction _____ hrs
- Small group instruction _____ hrs
- Assessment (includes DRA) _____ hrs
- Intervention/SST _____ hrs
- Special education _____ hrs
- Counseling, discipline, and yard supervision _____ hrs

Activities for Faculty Development

- Collaboration _____ hrs
- Professional development/Critical friends/Staff meetings _____ hrs
- Faculty recruitment _____ hrs
- Oversight _____ hrs

Activities Relating to Parents

- Orientation _____ hrs
- Parent education, communication, and conferences _____ hrs
- Events (PTA, School Fair, Back to School) _____ hrs
- Helping students _____ hrs

Other Administrative Activities

- Financial _____ hrs
- Program development _____ hrs
- Communications (other than included in various activities above) _____ hrs
- Other (state compliance, collaboration, etc., not included above) _____ hrs