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PREFACE
Linda K. Lemasters

With the publication of Issue 17:2, I especially would like to thank the authors of the articles in this issue; they accepted the suggestions of the reviewers and revised their work in a very timely manner. Appreciation goes out as well to the ISEP Board and the membership for their support and willingness to help. We noted in the last issue that *Educational Planning* now is indexed in the *H. W. Wilson Education Index*. We have signed a contract with *EBSCO*, so our articles and journal are found in the *EBSCO* database. *EBSCO* has been serving libraries and organizations worldwide for more than 60 years.

The topic of teacher training reforms initiates this issue with an article by Selahattin Turan that examines "the paradigmatic shift of Turkish teacher training programs within the initiatives of the Turkish Higher Educational Council in the last two decades." The next article continues to discuss educational reforms, but this time the setting is China. This article, too, notes teacher development ideas but within the paradigm of TQM. The article explained, however, that within the current political, social, and cultural contexts in China, full implementation of TQM would be difficult to accomplish.

The subject matter then changes with an submittal by Craig Howley. He initiates an interesting discussion of construction costs in relation to school enrollment. I will not share his findings at this point, as I want you to read the article. It is a document that encourages much needed dialogue, as well as one that is well grounded in planning processes and discussions.

Finally, Eleanor Wilson shares the issues of accountability and assessment in elementary education from the perspective of second grade students, pre-service elementary education students, and licensure standards for future teachers. In Wilson's own words, "the paper summarizes the ways in which these three perspectives influenced the development of a school/university reading program and the importance of balancing these aspects as one plans for such a collaboration.

This preface would be incomplete without saying thank you to Glen I. Earthman for his continued contributions that make the publishing of this journal possible.

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TRANSITION OF PLANNING PROCESS OF TURKISH TEACHER EDUCATION
REFLECTED ON CURRICULUM STRUCTURES[1]
Selahattin Turan

ABSTRACT

The planning efforts, including teacher training reforms, from the beginning of the first modernization attempts have been underlined by the notion of westernization and the passion to be 'modern' since the declaration of the new Turkish Republic on October 29, 1923. In the early years of the Republic, significant reform laws were adapted and put into force including the "Law of Unification of Education." Since the early years of the Republic, education has always been identified as a transformational change agent within all aspects of Turkey's social, political, and cultural structures, facilitating the dynamics of modernity. Modernization as a challenge has always created an ideological conflict between "conservatives" representing "status quo" and reformers struggling with the current challenges with the conservative paradigm. The aim of this study was to critically examine the transitional planning process of teacher education programs. In addition, another goal of this research project was to present the conflicts concerning Turkish educational reforms in the last decade by emphasizing a direct linkage between shifts in curriculum structure during in the 1996 and 2006 academic years. From a theoretical perspective, this study also purposed to examine the paradigmatic shift of Turkish teacher training programs within the initiatives of Turkish Higher Educational Council (HEC) in the last two decades. The results of this study indicated that the political agenda always has dictated the development of teaching policy in the country with little attention to social-cultural milieu on the governmental structures created to administer the policy since the declaration of the New Turkish Republic.

INTRODUCTION

For Turkish society, the Western style of enlightenment has served as a transitional period in which the concept of modernization has been engrained within all social, political, and ideological functions of education, specifically within the realm of teacher education. The modernization and educational reforms are basically understood in terms of positivistic Westernization traced within educational policies and implications through the modernization process. Throughout the modernization process of the Turkish Republic, the teaching profession has always had a component of central state bureaucracy, engaged with distinctive state function (Kazamias, 1966; Koçer, 1987; Akyuz, 2007). As Boyaci (1999) stated:

> within this distinctive state function, their primary mission was to educate the masses in the line of Kemalist principles at schools. With this mission they also became crucial figures in the creation of legitimization bases for central political authorities, which have aimed to realization of social, economic, and

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political transformation. Within this framework, teachers were aligned with the modernization and secularization process in Turkey. (pp. 51-52)

With passage of the *Law of Unification of Instruction in 1924*, education as a public institution became centralized and bureaucratized within the state domain, so central political and ideological dominance could be centralized in order to disseminate notions of modernization over all the regions of the Turkish Republic. Today's bureaucratic structure of education was constructed during this important era. For the first time, teachers were defined as the members of the central state bureaucracy and were required to disseminate the mandated republican ideology. In this sense, curriculum structures of teacher training were composed of courses focusing on the basic social science structures of national identity and technical courses, which empowered teachers with contemporary skills that contributed to the modernization of the country. In 1924, sociology was introduced for the first time within teacher training programs, so future educators could emphasize national identity of citizenship in a professional domain. In 1937, the teacher training program introduced the core courses of pedagogy, psychology, history of education, instructional methodology, and school health to empower the professional aspect of teaching. 'Not being practice oriented' was the essential criticism directed to the directors of the 1937 program. In 1980, the structure of the teacher training curriculum was exposed to minor reforms, which focused only on the length of teacher education. All of the remaining modifications concerning teacher education focused on the modern, national, and secular development of society by targeting social and technical skills attributed to teachers. These policymakers ignored the implementation of demonstrated pedagogical skills in classroom settings, which was believed to have contributed to the failure of these changes. Since then, the reformation of curriculum structures of the teaching profession has preserved its popularity due in large part of its political and ideological missions. In this sense, a national debate over undergraduate teacher education has ensued due to the European Union (EU) integration process for the last two decades (Akyuz, 2007, 2006; Buchberger, Campos, Kallos, Stephenson, 2000; Somel, 2001; Turan, 2000).

Teacher education has been structured within the university system under the strict control and supervision of the government's Higher Education Council (HEC). This commission is the central supreme council which regulates all Turkish public and private universities, community colleges, and all vocational and technical schools. Planning policies and policy implications of the HEC continuously have come under criticism, and many scholars believe it has not realized its mission to modernize the country (Akyuz, 2007; Guler, 1994; Tosun, 2004; Sisman, 2003). One fact, which has contributed to this notion, is the HEC's planning hierarchy, which includes the State Planning Organization (SPO), the Teacher Education General Directorate, the Research Planning Branch (RPB) of the Ministry of National Education, the Training and Education Advisory Board of the Ministry of National Education, and the National Committee of Teacher Education of HEC. In addition, a policy organization called the National Educational Council, composed of bureaucrats, teachers, principals, local governors, and peoples from different civil, public, and private sectors, exists to

functions as a nation-wide counseling board. Despite the existence of these bureaucratic structures, strategic planning in the public domain, particularly within the realm of public education, is thought to be dysfunctional and ineffective, especially when taking into consideration the implications of various educational plans. The reason for the failure needs to be questioned by scholars and policymakers to determine whether the failure stems from the planning process itself or from the failure of the institutions and administrative structures to implement the mandated reforms.

A BRIEF HISTORICAL BACKGROUND

Analyzing brief historical milestones of the Turkish teacher training process within a socio-economic and socio-political context will enable readers to place these issues within a critical context. Formal Turkish teacher preparation dates back to 11th century with the madrasah (theologically dominated higher education institutions attached to a mosque) system imparting mores while simultaneously shaping social structures with its rich religious tradition. Yet, the first comprehensive teacher training programs emerged in 1869 with the enactment of *General Law of Education*. With this law, the first teacher schools were established, and the codification of the necessary qualifications for teachers and requirements for students desiring to become teachers were identified. As a result, the social and legal status of the teaching profession increased (Akyuz, 2007, 2006). The critical organizational and curriculum structures of the schools were established with standards imported from the Western tradition. The schools within the modernization endeavor, accelerated by the Ottoman bureaucratic elite, constituted a challenge for representatives of the ruling Islamic elite. A conflicting dual structure emerged, which instituted antagonism between traditional structures focusing on Islamic values and tradition and the new elites, who were more accepting of secular values. With the proclamation of the Turkish Republic, the focus shifted towards the modernization process and the apparent abolishment of conflicting cultural paradigms, which ultimately favored 'modernity.' Through modernization, the education of Turkish youth was viewed as an ideological change agent and a method by politicians to uplift the entire society (Akyuz, 2007; Kazamias, 1966; Turan, 2000). Within this perspective the strategic planning process within the public domain was redesigned and restructured to realize this ideological goal. As part of the modernization of Turkish education leading scholars such as John Dewey, Miss Parker, W. Dickermann, K. V. Wofford, John Rufi, E. Thomkins, L. Beals, R. J. Maaske, E. S. Gorvine, P. Schwartz, and O. Buyse were invited to help design a new educational structure for the new Turkish Republic.

Several reforms and innovations were started to take place in the early years of the Republic, and teachers were identified as the leaders of Turkey's transition from a traditional to a modern society. During this era of reform, the Turkish educational system was centralized by enactment of the *Law of Unification of Instruction in 1924*. This act placed all educational institutions under the strict control of the Ministry of National Education. Since then, all important policy and administrative decisions, including the appointment of teachers and administrators, the adoption of textbooks, the selection of

subjects for the curriculum, have been made by the Ministry of National Education. This centralized educational system continues to remain in place. In the first half of the century, great differences between the needs of the rural and urban parts of the country led to different approaches to teacher education programs for rural and urban areas. As a result, two types of teacher education schools were designed to meet the different demands of the country in 1926: (a) primary teacher schools for urban areas; and (b) village teacher schools for rural areas. As stated by Boyaci (1999):

> In order to provide teachers especially for rural areas, proper teacher training institutions, village institutions, were established. Although the critical goal of the village institutions were to improve the educational conditions of rural areas by training the village youth as the teachers for their villages, there existed two main goals behind that: That were to train village youth (a) as the leaders of their community, who would start a drastic economic development of their villages and (b) as the political and ideological leaders who would disseminate modernist republican ideology and prevent the destructive effects of religious leaders in the mosque of the village, who were against the non-traditional notions that came with foundation of Turkish Republic. (pp. 61-62)

The village institutions were abolished with the political turbulence originating from ideological debate over the village institutions in 1954. From this date until now, there has been no differentiation between rural and urban areas in terms of teacher education curriculum, including taking into consideration the unique needs of rural areas within a highly centralized educational bureaucracy. In the second half of the 20th Century, two major changes in teacher education policy in Turkey were realized. The first one was the acceptance of the *Basic Law for National Education in 1973*. Up until this date, teachers had been educated in either certain boarding teacher schools or in more formalized institutes of education. Teacher schools were actually secondary schools from grades 6 to 12. Institutes of education were two- or three-year higher education institutions admitting students after graduating from high school. In 1973 in the light of the *Basic Law of National Education,* all teachers were required to be educated in higher education institutions. Such a policy shift resulted in the redesigning of teacher schools as higher teacher colleges, and teacher education programs for elementary education were transferred to two-year post-secondary education institutes. The students who were graduated from these Institutes were employed as classroom teachers in elementary schools.

The second major change in teacher education occurred in 1981. A unified system of higher education was introduced and the responsibility for teacher education was transferred to the universities within the HEC established as a planning and coordinating agency. Some four-year teacher training colleges were transformed into new faculties' educational institutions. In doing so, the responsibility of teacher preparation was transferred from the Ministry of National Education to the HEC. After 1981, prospective elementary and secondary school teachers were required to complete four years of university education, while elementary teachers were only required to attend two years of college. In 1989, regardless all teacher trainees were required to have B.A.

degree in education approved by the HEC. Since then, the schools of education have been officially identified as the main source providing teachers to Turkey's national education system (Altun, 1996; HEC, 1995, 1998, 2007).

REVITALIZATION OF TEACHER EDUCATION CURRICULUM STRUCTURE IN THE LAST DECADE

HEC is a unique institution in that it is responsible for the restructuring process of teacher education. All teacher education programs within the colleges of education are under strict administrative and instructional control and supervision of HEC. For example, in 1997, HEC identified and reformed teacher training programs in kindergarten, general classroom instruction, science, elementary math, social studies, Turkish, English, German, French, music, art, physical education and sport, hear-impaired, mentally handicapped, visual impaired, information and computer technologies teacher training programs. In addition, curriculum structures of the courses concerning pedagogical formation such as educational administration, curriculum development, educational psychology were also revised based upon the belief those courses were deemed to be inefficient and outdated. After the HEC's decision in 1997, curriculum structures of teacher training were standardized throughout Turkey's all colleges of education.

With the addition of new programs such as: introduction to teaching profession, school experience I and II, psychological development and learning, planning and evaluation in instruction, instructional technologies and material development, classroom management, branch based instructional methodologies I and II, counseling and guidance, an additional course entitled teaching practice was initiated. Ultimately the goal was to create a practice based curriculum utilizing all the essential skills required from the teaching profession. However, these reforms did not go unchallenged. The curriculum structure was criticized for ignoring the social, political and ethical aspects of teaching profession. In addition, a dispute in the agency emerged over the belief that the HEC reduced the importance of the teaching profession to just another market-based profession dominated by academic elites centered in Ankara. The rationale behind 1997 Reform of Turkish Teacher Education was:

- Lack of coordination between the Ministry of National Education (MoNE) and Higher Education Council.
- Duplication of courses and programs having same academic objectives between the education and the of art and science faculties.
- Research topics and activities in schools of education which ignored the needs of teaching professionals.
- A teacher training focused mostly on theory rather than clinical practice.
- Lack of professional development on topics deemed relevant by teacher training faculty (HEC, 1998).

As a result of the growing criticism and changing political agenda, the HEC in 2006 decided to once again revise the curriculum structure of teacher training. With this last revision, four new programs were created and several of the previously abolished courses were reinstituted. Arabic teaching, culture of religion and morals,

Japanese teaching, and talented and gifted teaching programs were established in colleges of education. In addition to the new content, the pedagogical curriculum was also modified have become the essential courses for current teachers for the Turkish Republic. The 2006 reforms also loosened the strict curriculum structure and enabled college administrators to design new electives. When compared to 1997 reforms, the features of curriculum revisions in 2006 have the following similarities:

- In both curriculum reform efforts, comprehensive needs assessments and pilot studies concerning teacher education were not made within a Turkish cultural context.
- The academicians and the policy makers at the HEC in Ankara became the unique actors in the planning process.
- The participation of those affecting and being affected by teaching–learning activities into teacher education planning process was limited.
- Though in the reform effort in 1996, there had been cooperation between Higher Education Council and Ministry of National Education. In 2006 there was no cooperation with the Ministry of Education because of the perceived ideological differences between the conservative Turkish government and the more secular members of HEC, who regard themselves as the protectors of the 'secular' state (HEC, 2007).

One of the amendments undertaken by the new arrangement was the training of branch teachers for upper secondary schools. The new arrangement stipulated that branch teachers for upper secondary schools are trained by means of graduate studies (without dissertation), a modification, which differed from the former practice of a single comprehensive exam that encompassed all 4 years of post-secondary education. Accordingly, the duration of the training programs for branch teachers in upper secondary education was increased to 5 years (HEC, 1998, 2007).

DISCUSSION

The planning efforts from the beginning of the first modernization attempts have been underlined by the notion of westernization and the passion to be 'modern.' Actually up until now it has been a transition process. During this timeframe, education has always been identified as a transformational change agent within all aspects of Turkey's social, political, and cultural structures facilitating the dynamics of modernity and the strategic planning process. Modernization as a challenge has always created an ideological conflict between "conservatives" representing "status quo" and reformers struggling with the current challenging conservative paradigm. In this sense, strategic planning has been a key component of an ever-political agenda rather than rational thinking throughout historical process of this transition. Although within a historical perspective teacher training goes back to 1860's with the opening of the first teacher schools, sociologically their failure has resulted in constructing authentic teacher training programs, system compatible with indigenous values and socio-cultural demands of Turkish society. From an administrative perspective, the failure of the strategic planning process has been accelerated.

The first attempt at reforming teacher training program structures was realized in the second half of the 19th century with the establishment of specifically designed teacher schools utilizing Western pedagogies. At the same time, these reforms created tensions between bureaucratic elites and scholars regarding the ideological and political functions of universal education. In fact, during this period of a transition from traditional religious-based education to modern educational pedagogy, education failed to realize its objectives due to the existence of conflicting structures between traditional and modern teacher training systems. The reasons for these planning failures was due to the Ottoman bureaucratic elites' attempts to construct a new system predicated upon an old paradigm, which ignored the resistance coming from traditional layers of the society. With the proclamation of the Turkish Republic, teachers were awarded the status of civil servants and were seen as the disseminators of the state ideology with a continual focus on creating national, secular, and modern social structure in the early 1920's and 1930's. In other words, Turkish leaders regarded education as a power in transforming and uplifting the entire society as stated in Kazamias (1966):

> Education was inextricably bound up with political, economic, and cultural independence and with breaking the shackles of traditional beliefs and outlooks; it was the means of nourishing national aspirations, creating the consensus necessary to sustain a free national state, training new Turkish leaders, and paving the way towards a dynamic and modern society. Knowledge and science were regarded as power and as the leverage in transforming and uplifting the entire society. (p. 115)

During this timeframe, strategic planning was approached from a political and ideological perspective, primarily focused on the creation of the national state and the amelioration of education within Turkish society. Thus, centralized educational planning served as key instrument providing education improvements across all regions of the country and enabled the educational system to become more compatible with the social, cultural, and political agenda of the new Turkish Republic. When these nationwide central planning outcomes in education were analyzed both quantitatively and qualitatively, it can be discerned that considerable improvement was realized through creating a modern society until the 1940s.

The political turbulence between 1940 and 1960 created an upheaval in determining the priorities of educational planning. In 1961, with the establishment of the State Planning Organization, socio-economic development of the country was linked to the government's central planning policies. Although educational policies were directly tied to the implementation of various socio-economic priorities of the nation, teacher education programs failed to be the primary component of any planned state sponsored modifications. There are several reasons for this assertion. The first is no official and legal obligations existed to implement central educational and socio-economic plans. In addition, central planning process lacked the collective participation of classroom professionals and those administrators directly or indirectly involved in educating students. Finally, planning of teacher education programs has been relegated only to the professional domains of bureaucratic experts.

Although there is a planning hierarchy, which includes the State Planning Organization (SPO), Teacher Education General Directorate, Research Planning Branch (RPB), Training and Education Advisory Board of Ministry of National Education, and the National Committee of Teacher Education of HEC, a lack of coordination exists causing problems among those institutions and commissions. While many scholars believe the reason for this failure emerged in the higher education planning process, it should be noted the failures probably lie within the planning paradigm itself. Centralized planning in the Turkish higher education system as an integral part of an overall central public planning structure has been in conflict with contemporary planning approaches, attempting to establish standardized practices and the inefficient delegating to those individuals previously involved in the planning process. Another explanation for the inconsistency in educational planning reforms relies upon the belief by some scholars that the planning process seeks to affirm the political agenda of the nation's leaders rather than being constructed on an evidence-based decision making process. The Turkish higher education planning system is highly centralized. Within this highly bureaucratic structure among planners and policy makers, no consensus or long-term strategic objectives for the training of competent and highly qualified teachers capable of producing improvements in student learning has been developed. Until such unanimity has been reached among planners and policy makers, the essential knowledge and skills that teachers must possess are yet to be achieved.

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THE FEASIBILITY OF IMPLEMENTING TOTAL QUALITY MANAGEMENT PRINCIPLES IN CHINESE EDUCATION: CHINESE EDUCATORS' PERSPECTIVES

Tak Cheung Chan
Yiping Wan

ABSTRACT

The purpose of this study was to investigate, through the perspectives of a group of Chinese educators, the feasibility of implementing the principles of Total Quality Management (TQM) in Chinese education. This study took a qualitative approach by posing open-ended questions to the Chinese educators. Then, a focus-group discussion, a small group discussion, and individual interviews were followed up to provide opportunities to brainstorm critical issues relating to TQM. The findings of the study indicated that Chinese educators considered TQM principles in general to be helpful in fostering the quality of education in China. They found five TQM principles to be particularly compatible with traditional Chinese culture. Difficulties in implementing TQM principles in Chinese education also were discussed. They further agreed that the present Chinese open-door policy could provide an inviting environment to implement TQM for educational improvement.

INTRODUCTION

Since W. Edwards Deming initiated his Total Quality Management (TQM) theory, business has adopted it as a model for business productivity and improvement with somewhat success. The fourteen principles Deming created in his TQM theory focused on continuous effort for improvement as an institution keeps up its pace for growth (Norton, 2005). They initiate an approach to improving an organization by teamwork and collaboration among managers and workers (Cunningham & Cordeiro, 2006). The fourteen principles are: (1) create constancy to improve the product or service; (2) adopt a new philosophy by changing perspectives and breaking from tradition; (3) cease dependence on mass inspection; (4) seek long-term overall efficiency; end the practice of awarding business by price tag alone; (5) constantly improve the system of production and service; (6) institute training and retraining of new employees; (7) provide leadership of the trade; (8) dispel fear out of employees' minds; (9) break down barriers between staff; (10) eliminate slogans and exhortations; (11) eliminate numerical goals and quotas; (12) promote the pride of workmanship; (13) institute a vigorous in-service training program; and, (14) create management structure for constant improvement of knowledge and effectiveness (Deming, 1993).

While educational systems are undergoing vigorous reform, Total Quality Management has drawn the attention of educational leaders who are anxious to demonstrate educational outcomes by improving student achievement (Siu-Runyan and Heart, 1992). Because of the context of public schooling, however, the implementation of TQM in education is significantly different from its use in business (Olson, 1992). Key implementation elements include establishing a strong sense of school vision,

promoting personal mastery learning for all organization members, focusing strategy on student-driven values, developing outrageous goals, and improving daily management (Herman & Herman, 1995; Murgatroyd, 1992; Nelson, 1994). Studies have indicated that the principles of TQM are in alignment with school improvement initiatives (Rodgers, 1998; Spirrison, 1998). Educational leaders believe that TQM could be applied to developing plans to optimize educational opportunities (Cammaert, 1995; Wilcox, 1992). Research in TQM has shown successful application of the fourteen principles in various fields of education: school culture and teacher empowerment (Marshall, Pritchard, & Gunderson, 2004; Paul, 1998), student attendance (Maulding, 1998), academic achievement (Straus, 1996), and parent and student needs (Chappell, 1993). TQM principles also were implemented in educational management overseas. Schools in South Africa have adopted Deming's principles that have resulted in enhancement of school efficiency and effectiveness (Hayward, 1998; Lukhwareni, 2003; Mohaladi, 2001; Smith, 1994). Similar quality improvement also was found in Brazilian schools where TQM was implemented (Bof, 1997). Countries going through educational reforms are exploring the feasibility of applying the principles of TQM to achieve reform purposes in their schools.

PURPOSE OF THE STUDY

The purpose of this study was to investigate the feasibility of implementing the principles of Total Quality Management in Chinese education through the perceptions of Chinese educators. In Summer, 2005, 42 Chinese educators representing seven provinces of China (Zhejiang, Guangdong, Fujein, Hupei, Henan, Szechuan, and Guangxi) came to the United States to study school reform initiatives practiced by U.S. educators. They participated in workshops and training sessions organized by the researchers to discuss the principles of Total Quality Management and their implication to educational management. The Chinese educators were invited to share their perceptions of exploring the feasibility of implementing TQM in China. In this study, the Chinese educators were asked the following questions:

1. Is it feasible to implement Total Quality Management principles to improve education in China?
2. What TQM principle(s) could be best implemented to school improvement in China?
3. What TQM principle(s) could be difficult to implement to school improvement in China?

CONCEPTUAL FRAMEWORK

Professional literature abounds with programs and studies that promote diverse ways to use Total Quality Management as a means to improve the quality of educational programs. Research indicated that TQM dimensions were consistent with the parameters of the school improvement initiatives and thus helped promote school improvement plans (Bornyas, 1995; Chappell, 1993; Detert, Louis, & Schroeder, 2001). Continuous improvement called for in TQM was in alignment with the accountability movement

associated with educational reforms (Hixson & Lovelace, 1992; Shipe, 1997). Research findings indicated, however, that commitment from educational leaders was essential to successful implementation of TQM in educational settings (Bryant, 1995; Detert, Bauerly Kopel, Mauriel, & Jenni, 2000; McDonald, 1996; Rappaport, 1993; Williams, 1996). Many educational leaders believed that TQM had positive impact on school improvement (Ford, 1998; Wilcox, 1992). Change of educational leaders would have negative impact on TQM implementation (Danne, 1992; Lembeck, 1995).

In elementary school application, TQM was found to have increased teacher and leadership collaboration in school improvement projects (Bartoletti, 2000). Blankstein and Swain (1994) cited the success of a Florida elementary school in overcoming difficulties to implement TQM principles for school improvement. In secondary schools, the overall attitudes of educators toward TQM were found to be positive (Bravo De Murillo, 1994). Success stories also were reported by Konopnicki (1996) in secondary schools in Virginia Beach where students experienced early gains from new TQM instructional practices. Turk (1994) explained that teachers favored TQM because they felt empowered in TQM implementation. McDonald (1996) and Teigland (1993) have detailed the procedures of implementing TQM principles in schools. TQM training was identified as crucial for successful implementation of TQM in school management (Bauerly Kopel, 1997; Bof, 1997; Johnson, 1998; Sadler, 1996). In higher education, TQM principles also were successfully applied to student admission, employee safety, policy formation, management performance appraisal, student services, and operational planning (Tyler, 1993).

In the TQM implementation process, possible constraints were identified as insufficient knowledge, lack of tools, short of financial support, lack of feasible leadership commitment, poor data and deployment plans, inflexibility of piecemeal implementation, unrealistic expectations, and inadequate managerial skills (Detert, Bauerly Kopel, Mauriel, & Jenni, 2000; Evangelista, 1995; Hernandez, 2001; Lares, 1995; Munro, 2008; Murgatroyd, 1993; Regauld, 1993; Sergiovanni, 2001). The benefits of installing TQM principles in education were investigated: (a) TQM implementation was closely related to matriculation passing rate (Mohaladi, 2001); (b) TQM improved student attendance and dropout rate (Bof, 1997; Maulding, 1998); (c) TQM implementation helped improve student discipline (Lares, 1995); (d) TQM was found to have improved mathematics score (Straus, 1996); and (e) TQM was related to school climate and culture (Paul, 1998).

SIGNIFICANCE OF THE STUDY

This study is significant because it is the first study of its kind to investigate the feasibility of implementing TQM principles in Chinese education. It provides an example of an honest assessment of strengths and weaknesses of TQM as it comes in contact with the political, social, and cultural dimensions of an Asian country. Results of the study provide readers with a fair examination of the implementation of TQM principles in both micro and macro perspectives. This study helps recognize the advantages and disadvantages of implementing Total Quality Management in education in countries

other than the United States. Based upon the outcomes of this research, studies of other formats and magnitudes could be designed to further examine the implementation of TQM to education.

METHODOLOGY

This study took a qualitative approach by posing open-ended questions to a group of 42 Chinese educators, who were on a visiting tour to Kennesaw State University in 2005. Written responses were followed by group discussions and interviews. Among the respondents were 18 school principals, 16 lead teachers, and 8 educational administrators at the provincial level.

A survey instrument consisting of three major open-ended questions was designed to gather information relative to the research questions. The first question was focused on gathering information about the respondents' general feeling about TQM and its application to education in China. In the second and third questions, respondents were asked to evaluate each of the 14 principles to determine the feasibility and difficulty of its implementation in Chinese education.

After an intensive training workshop on Total Quality Management Theory and its application, the Chinese educators were asked to respond to the open-ended questions about the implementation of TQM in China. A follow-up focus-group discussion session was arranged for the respondents to brainstorm critical issues relating to TQM and its educational reform climates in China. The respondents were then divided into small groups to discuss each of the 14 principles in detail to examine the feasibility for implementing TQM in Chinese education. Follow-up interviews also were scheduled for 3 principals, 3 teachers, and 2 provincial administrators to solicit their individual perspectives on TQM. The use of open-ended survey, focus-group discussion, small group discussion, and individual interviews provided opportunities for Chinese educators to respond in different research settings with comfort. It also allowed the researchers to cross-reference significant information provided by the Chinese educators (Torbert, 2002). All qualitative data collected through written responses, focus-group discussion, small group discussion, and interviews were categorized systematically, coded, and analyzed by carefully examining consistent patterns of consistencies and disparities.

RESULTS

Research Question 1:

Is it feasible to implement the principles of Total Quality Management to improve education in China?

Through data analysis the researchers found that Chinese educators perceived the general theme of Total Quality Management to be very exciting. They felt that climates were favorable for the implementation of TQM while Chinese educational systems were undergoing vigorous reform. They also agreed that the principles of TQM to strive for continuous quality improvement had much to contribute to upgrading the quality of education in China.

Chinese educators in general responded favorably to Deming's TQM Theory.

Most of them agreed that TQM could provide a conceptual framework for educational reforms in China and that TQM could help reinforce the confidence of Chinese educators in their pursuit for educational reforms. Some positive responses from the Chinese educators are quoted in the following:

- Initiating innovative ideas like TQM will help promote the educational development in China.
- Deming's quality improvement initiative emphasizes the advancement of the entire organizational process.
- As a model of strong leadership, TQM recommends leaders to make continuous improvement for more productive outcomes. It does not set a standard for the organization to achieve.
- The systematic communication model of TQM serves a useful purpose in fostering a better understanding among components of Chinese educational reforms today.
- Current educational evaluation movements in China facilitate the implementation of TQM principles. Evaluation can help measure the improvement in educational quality.
- The ideas of TQM could provide strong support to building a high quality teaching team.

Responses from the Chinese educators were objective and multifaceted. They opened up many possibilities to further explore the principles of TQM and their implementation in Chinese education. They particularly highlighted certain examples of current educational movements in China to which TQM could constructively contribute. These educational movements included higher education reform, educational evaluation, accountability management, and building quality teaching teams.

Research Question 2:

What TOM principle(s) could be best implemented to school improvement in China?

The respondents found that certain TQM principles were compatible with Chinese culture and tradition. They could easily be adopted for use in Chinese education. Out of the 14 TQM principles, pride in workmanship, continuous improvement, barrier break down, in-service training, and leadership provision seemed to be working well with traditional Chinese culture.

Deming's *pride in workmanship* is in total alignment with Chinese educational practices. As described by Educator N, school success was "the cumulative effort of teachers and staff working as a team." The idea was further elaborated by Educator J that "Teachers claim ownership of their school and students." Another educator also added that the key to school success was: "Teachers take pride in student success and the school takes pride in teacher success."

Building a strong teacher team by *breaking down barriers* between teachers and staff was supported by Educator R. The notion was also enthusiastically endorsed by three of his colleagues. Educator G noted: "The TQM could serve a useful purpose in

opening communication channels in Chinese education."

In-service training as advocated in TQM has always been a strong component in Chinese education. It is understood well among teachers in China that they need to continuously improve themselves professionally. One educator identified moral improvement and teaching skills as areas that needed to be focused on. There was no doubt that Chinese educators believed in in-service training as a channel of continuous improvement.

Provision of leadership in a school setting was strongly supported by one of the educators who referred the success of a school to its strong leadership. The significance of instructional leadership was stressed by Educators A, J, and M. To illustrate the unique role of school leadership, Educator CC claimed that "principal leadership is built on role modeling good character."

As stated by Educator AA, "TQM does not set the standard of the best but it calls for continuous attainment of better quality." Deming's theory fits in well with the traditional Chinese saying of continuous improvement as a means of self-challenge. Educator M also said, "teachers need to constantly improve themselves by trying new approaches. The essence of quality improvement in education is the creation of a highly qualified teaching team."

Research Question 3:

What TQM principle(s) could be difficult to implement to school improvement in China?

Even though Chinese educators had expressed keen interest in and serious consideration of implementing TQM, their enthusiasm was not without reservation. The Chinese educators were not totally optimistic about the implementation of TQM in China. They felt that some TQM principles, such as individual inspection of product, elimination of slogan, and elimination of numerical quota, were problematic and could be difficult to be implemented in Chinese education. These TQM principles are described in the following paragraphs:

Mass inspection of product as proposed by Deming resembles standardized public examinations in education. Most Chinese educators disliked comprehensive public examinations as a measure of student success. One of the educators described comprehensive examination as overshadowing the individual intelligence of students. "It limits teachers' creativity and students' diversified development." Given the context of test-driven curricula and overall mindset of majority community members, however, they knew very well that it was not easy to abandon the comprehensive examination that is presently used nationwide as a criterion to determine student achievement. Even in the classrooms, mass instruction and standardized testing activities are still being practiced. Because of large classes, individualized instruction is difficult, if not impossible.

Deming called for eliminating slogans in business management because many slogans had been raised with no practical substance of quality planning. Traditionally, however, educators in China are still looking for developmental directions from

the Central Government in the form of slogans. Slogans have been used as tools to propagandize political movements in China for decades. In a highly centralized society such as China, the government heavily relies on slogans as a vehicle of motivation, and they will continue to be widely used in public campaigns for education.

Deming preferred a system that fostered an atmosphere of receptivity and recognition to one that measured people by the numbers they turned out. To him, looking for quick ways to improve test scores by setting numerical quotas rather than working to foster creative problem solving, critical thinking, and a higher level of learning defeated the purpose of education. Chinese educators had an opposite viewpoint. They agreed that numbers often were associated with educational goals and outcomes with no specific guidelines and support; however, it is not easy to eliminate numbers in education. As Educator T put it, "Eliminating numbers to evaluate educational outcome will end up being a worse game to play. Quantitative measure in education is still needed as a basis to determine quality."

Additional Findings:

During the focus-group discussion and individual interviews, Chinese educators brought up some critical issues in implementing TQM in education in China. Even though they responded favorably in support of the TQM theory of management, hurdles growing out of the organizational patterns of the country had yet to be overcome. These issues are summarized in the following paragraphs:

First, the Chinese educators were concerned with how education quality was defined and how educational outcomes were measured in terms of quality. Parents, principals, community, and government might have different expectations and set different performance standards. The implementation of TQM would certainly bring about a change in the way that Chinese education is operated. Resistance to change is anticipated until evidence of success is fully assessed.

Second, educational leaders in China could be reluctant to initiate innovative reform ideas for fear of being singled out for previous mistakes. Some might even be afraid of supporting the change because of uncertainty that the change would be endorsed by their new leaders of the central and/or provincial governments. To have TQM successfully implemented in China, people need to understand that bringing in new ideas does not mean finding mistakes in current policies. It only means introducing different approaches that could possibly improve educational efficiency and effectiveness. The Chinese educational system, however, is a typical top-down type of organization that allows little room for local input.

Third, some Chinese educators were still doubtful whether a business model like TQM would work in Chinese education. TQM has a business orientation of profit making as indication of success whereas Chinese educators considered education not as a profit making business but as a long-term commitment for the welfare of future generations. Could these two ideologies find common grounds? Many Chinese educators firmly believe that education management greatly differs from business management. Therefore, the guiding philosophies of the two should be different too.

Fourth, "it is not easy for TQM to be implemented in China because the current educational system engages in change activities that are supported by people currently in power. Many examples can be quoted to demonstrate cases of abandoning reform efforts when a new class of leaders comes to power." Educational reforms with no legislative foundation will vanish with people losing power.

Fifth, some educators were relating implementation difficulties to the understanding of TQM theory. As stated by one educator, "The problem is not with the policy makers but with educators' understanding of the concept and how it works." If a decision is made to give a chance for TQM to be tried in education in China, enormous effort has to be invested in working with teachers and administrators to ensure that they are comfortable with operating the system with Total Quality Management, unless top Chinese leaders have fully bought into the TQM model.

Sixth, school principals in China today have only short-term assignments as administrators of schools. Principals are only interested in school improvement projects that result in immediate demonstration of successful leadership. "Unless the implementation of TQM could document some quick evidence of school success, the improvement theory of TQM may not receive any favorable support from local school administrators."

Seventh, TQM as a business model has not been proven yet as a successful model in the business community in China. Even with a very successful business model, it may have tremendous difficulties to be transplanted to the education settings. It has to be tried in a small scale and eventually proved to be effective and useful.

Eighth, all the educators participated in this study came from provinces that are economically advantaged as a result of the commercial and industrial development of China in recent years. The views of other educators from less developed areas may differ dramatically.

DISCUSSION

Based on the responses of the research participants and the professional experiences of the researcher, it is assessed that full implementation of Total Quality Management Theory in Chinese education is difficult if not impossible in light of the political, social, and cultural contexts in China. The following points of observation are made for discussion purpose:

1. Some of the basic components of TQM, particularly "continuous improvement," would provide Chinese educators with inspiration and encouragement to proceed more confidently with their educational reform. This is in agreement with studies performed by Deter, Louis, and Schroeder (2001), Hixson and Lovelace (1992), Shipe (1997), and Wilcox (1992), who found similar results of TQM implementation in U.S. schools.

2. The findings of this study, with emphasis on the importance of leadership in the implementation of TQM, echoed previous studies conducted by Bryant (1995), Danne (1992), Lembeck (1995), McDonald (1996), Rappaport (1993), and Williams (1996) who stated that commitment from educational leaders was

essential to successful implementation of TQM.

3. That educators needed to have a thorough understanding of how TQM works is another finding of this study supported by previous work of Bauerly Kopel (1997), Bof (1997), Johnson (1998), and Sadler (1996).

4. The finding that TQM would help promote the team effort of teachers and staff is shared by similar findings of research done by Bartoletti (2000).

5. Some of the current Chinese educational movements such as educational evaluation, pride of education profession, quality teaching team, and teacher in-service programs could benefit from the ideas introduced by Total Quality Management; however, as China's national focus of development at this time is on economic growth, the decision of implementing TQM in education will be pondered around the issue of how TQM could eventually contribute to the country's economic growth with demonstrated outcomes.

CONCLUSION

Education in China has undergone reforms of various formats in the Post-Cultural Revolution period. Much work needs to be done to meet the basic education needs as well as the future challenges of the century. The respondents agreed that the open-door policy in China would provide an environment that could foster the implementation of TQM in China to improve education. They also realized that the principles of Total Quality Management could throw new light into enlightening ideas of educational reform in China. Out of the 14 points in TQM, pride in workmanship, continuous improvement, barrier break down, in-service training, and leadership provision were considered to be compatible with Chinese culture and tradition and would stand a good chance of successful implementation in China. Individual inspection of product, elimination of slogans, and elimination of numerical quota were typically considered as elements that would be difficult to implement in Chinese education fields. Despite social, political, and professional concerns, the Chinese educators felt that many aspects of Total Quality Management Theory could be favorably implemented in China. A Chinese proverb says, "Studying is like rowing a boat against a flowing current. If no effort is exerted in continuously moving the boat forward, it will eventually be pushed backward by the opposite current." The general theme of Deming's Total Quality Management theory is well reflected by the idea of this Chinese proverb.

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DON'T SUPERSIZE ME: THE RELATIONSHIP OF CONSTRUCTION COST TO SCHOOL ENROLLMENT IN THE U.S. [2]
Craig B. Howley

ABSTRACT

Conventional wisdom holds that economies of scale necessitate the construction of larger schools: anything done bigger is presumed to be done cheaper. The study reported here doubted that claim with respect to school construction. It posed two questions: (1) are larger high schools less costly to build than smaller schools and (2) what contextual variables predict cost? Just one scholarly peer-reviewed article has examined the relationship of construction cost to size, and conventional wisdom continues to prevail. Lack of scholarly interest in these questions is surprising, perhaps scandalous, in view of the large sums spent and the political battles often waged when new schools are built. The findings show that the smaller half of these 9-12 schools (planned to enroll from 138 to 600 students) were, on average, no more expensive per student to build than the larger half (planned to enroll 601-999 students) and were less costly per square foot ($96 vs. $110, significant at $p < .01$). Interestingly, subsequent enrollments for smaller planned schools were shown to have been underestimated, whereas subsequent enrollments for schools planned as "larger" were shown to have been overestimated. These tendencies, in fact, would tend to render planned smaller schools less expensive and planned larger schools more expensive per student, a key cost metric. The findings reported here probably represent conservative estimates. Total cost was well predicted (explaining 76% of variance) by five variables, with total square feet accounting for by far the most variance. Rural location tended to reduce contracted cost. Cost per square foot was less well predicted (25% of variance) by four variables. Cost per student was more fully predicted (40% of variance) by two variables. For all equations, local wealth revenue was associated with higher cost. The report concludes with nine recommendations for school construction planners and five recommendations for researchers.

INTRODUCTION

What do smaller high schools cost to build? Can the nation afford them? Oddly enough, as often happens in education policy, no one really knows because no one has really asked. This situation renders the comparison of costs and benefits quite difficult, to say the least. (Readers are asked to suspend their disbelief momentarily).

Much more, in fact, is now known about benefits than about costs. Among the most notable benefits is an achievement benefit—larger schools and districts embed

an achievement cost for impoverished students (e.g., Bickel & Howley, 2000; Fowler & Walberg, 1991; Friedkin & Necochea, 1988). In fact, a high school size above about 1,000 students has been shown to be detrimental to the tested achievement of all students regardless of socioeconomic status or poverty (Lee & Smith, 1997). Smaller school and district size are associated with greater equity of achievement measured as weakness of the relationship between socioeconomic status and achievement (Howley & Howley, 2004; see also Friedkin & Necochea, 1989). Smaller high schools also have been shown to be consistently associated with lower dropout rates and higher rates of participation in co-curricular activities (e.g., Fetler, 1989; Morgan & Alwin, 1980). Benefits for smaller schools also are claimed, on the basis of a somewhat weaker base of evidence, for teacher collegiality, school safety, and students' social and emotional development and well being (Cotton, 2001). Many large urban districts have concluded that the evidence is sufficiently strong to warrant policies that reduce the size of their high schools (School District of Philadelphia, 2005).

The present study sought to develop more information about the construction costs of smaller high schools, using information from two national datasets, augmented by telephone contact with study schools. The study investigated high schools partly because so many urban reform initiatives have adopted "small schools" policies (e.g., in Chicago, Los Angeles, New York, Philadelphia, and Seattle) and partly because when, in rural areas, new construction is undertaken, consolidation of two or more smaller high schools is so common.

This study addressed two research questions, as follows:

1. Are planned costs of construction equal for smaller as compared to larger high schools planned to enroll 1,000 or fewer students?

2. How do construction costs for such schools vary in light of school and context variables including planned enrollment, square footage, district revenues, locale, socioeconomic conditions, and ethnicity?

The study adopted 1,000 as the upper limit of total enrollment based in part on the finding that high schools larger than this introduce achievement costs for all students, regardless of race or socioeconomic status (Lee & Smith, 1997). This is a conservative upper limit: The National Association of Secondary School Principals (1999) suggested 600 students as the upper limit. From the perspective of this study, then, a decision to build new schools enrolling more than 1,000 students is not educationally suitable.[3]

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[3]   Another study completed by the author (see Appendix 2 in Lawrence et al., 2005) shows that *mega-schools* (those enrolling more than 500, 750, and 1,000 at elementary, middle, and high schools, respectively) allocate less than half the square footage per student than smaller schools allocate (e.g., those described in the present study). As a result, they are less costly per student. But they have been consistently shown to be much less effective than smaller schools, on average, as noted above. If one must ask whether the nation can afford smaller schools, one must ask if the nation can afford mega-schools that are educationally wasteful of talent. Many observers appear already to agree that it cannot. It's important to understand that not being a mega-

RELEVANT LITERATURE

Several searches of relevant databases assessed the existence of pertinent research. The result of these searches should be considered shocking, given the national propensity to build larger and larger schools. The study found a single peer-reviewed research study of school construction costs in the professional education literature (Azari-Rad, Philips, & Prus, 2002). Use of a variety of ERIC descriptors and search strategies yielded consistently similar results: the relevant literature is thin and superficial. Azari-Rad and colleagues, not surprisingly, refer to *no* prior literature in their study.

The study by Azari-Rad and colleagues (2002) was based on a national data set of accepted bid prices for schools built between 1991 and 1999.[4] The data set used in the study contained information similar to that supplied for the current study (that is, few variables and many cases). Analyses examined all schools together and high schools separately. Size of school in this study was measured by total square feet rather than by planned enrollment, and on this basis the researchers concluded that doubling the square footage of a project increased costs by 91%. They also concluded that a two-school as compared to a one-school option would increase construction costs by an average of 4.7%. Azari-Rad and colleagues, however, reported that this modest advantage is fully offset when "very large schools" are planned because these projects generate demand for local construction talent that is likely to increase costs from 8% to 12%. Their best advice for saving on construction costs had nothing to do with project size (defined as total square feet); they advised simply that school construction be planned for economic downturns, when costs will be lower due to weak demand for construction.

Lack of scholarly research[5] about school construction costs, however, does not indicate lack of interest. The construction industry magazines actively report on school construction, and business magazines and newspapers also report on the trends and issues that emerge in school construction. School construction is very big business indeed. For instance, a reporter for *Building Design and Construction* observed in 2002,

Builders completed more than $62 billion worth of U.S. educational facilities during 2001, an increase of 13 percent over the total for 2000. This growth was iden-

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school does not make a school small. Enrollment of 1,000 in a high school is a large size. A high school enrolling 100 students is a quite small high school. The data set used in this study has a comparable range of high school sizes.

4   The data were collected by a subsidiary of McGraw Hill (F.W. Dodge).

5   The literature search (between 1966 and 2003) also yielded four assessments conducted by Paul Abramson, and just three other relevant publications in *practitioner magazines*. In his latest annual school construction report in an industry magazine, Abramson (2004) observes that smaller high schools (smallest quartile, with a median planned enrollment of 375) appear (a) to be *less costly per square foot* and more spacious than larger high schools and (b) *no more costly per student* than the largest quartile of schools (with a median planned enrollment of 2,100 students).

tical to the growth rate recorded between 1999 and 2000, so there's no disputing the "star" status of the educational sector [of the construction industry]. (Delano, 2002, p. 19)

School construction has an important effect on the availability of decently-paid local or regional jobs, and—obviously—on the profitability of construction companies. From the vantage of the industry, moreover, larger projects entail larger management and design fees, often calculated as a percentage of the cost of the amounts budgeted for materials and labor (Lawrence, Bingler, Diamond, Hill, Hoffman, Howley et al., 2003). The construction industry, therefore, would arguably be the last entity to object to the construction of mega-schools enrolling 2,000 to 5,000 students.

School construction also figures in political agendas in educationally irrelevant ways. A 1998 article in *Crain's Cleveland Business* reported on the "prevailing wage" controversy in Ohio. In 1997, according to the article (Ford, 1998), the state legislature ended "the decades-old practice of requiring the payment of prevailing wages on school projects. . .at the urging of business lobbyists who argued the change would save school districts money." The Ohio School Facilities Commission, which funds school construction in Ohio, affirmed that it did not have the data to support the claimed savings (Ford, 1998). The single academic study in this literature (i.e., Azari-Rad et al., 2002), published three years later, found that such savings are indeed unlikely (based on national, not Ohio, data).

METHODS

This study addressed its research questions by constructing and analyzing a data set that combined information from (a) a large national data set of school construction projects alleged to include only cases (n=3,471) representing new construction with information from (b) the Common Core of Data (CCD), the annual census of all schools in the U.S. conducted by the National Center for Education Statistics. Analysis compared means of construction costs (t-tests) and made predictions about construction costs (ordinary least-squares regression) from salient contextual variables.

Data sets

The study acquired from Paul Abramson, author of School Planning and Management's "Annual Construction Report," a dataset of 3,471 cases of school construction projects (new buildings according to survey respondents) begun in the years 1989 to 2003 for planned completion in the years 1996 to 2009. This data set contained just eight unique variables: state, zip code, educational level (elementary, middle, and high school), total planned (contracted) cost, planned enrollment, planned square feet, planned start year, and planned end year. The substantive variables of interest, of course, were planned cost and size (in planned square feet and planned enrollment).

From the perspective of the research questions, the number of variables in the source data was inadequate. The grade level variable, for instance, did not indicate exact

grades; high and low grades were not part of the data set. This lack makes it difficult to compare schools with differing (or even the same) gradespan configurations. Worse still, the data set included none of the contextual variables of interest: information about poverty, race, and locale was all missing. For every school in the nation, however, the CCD does contain such missing information, and the study sought to match cases from the source data set with those in the CCD.

Creating the matched data set. In view of the challenge of accurately matching cases in the two data sets, the study tested an initial matching procedure, and improved the procedure based on the test. Appendix A describes the study's conduct of the test as well as the revised procedure. In brief, purposively selecting for high schools enrolling 1,000 or fewer students, the study matched 211 cases of high schools from the source data set with schools in the CCD. The probability of success was increased by telephone contact with the schools (see Appendix A for details).

Analysis. The augmented data set of newly constructed schools included 211 cases. Importing CCD data and developing an array of derived variables resulted in a data set with 119 relevant variables—as compared to the 17 unique and derived variables ultimately available in the source data set. The added data showed that the augmented data set contained two very distinct high school configurations: 9-12 high schools (n=168) and 6-, 7- or 8-12 high schools (n=41; referred to as 6-12 schools hereafter). The remaining 2 schools were configured quite differently; one was a 10-12 senior high school and the other a 1-12 school. These variations were expected; indeed, the matching process was necessary to identify such differences.

The study elected to concentrate effort on the 9-12 cases for two reasons. First, the 9-12 configuration is now the most common configuration for high schools in the U.S.[6] Second, the comparatively small number of cases of 6-12 schools (n=41), weakened the study's ability to answer the second research question for these schools both because fewer states were represented among the cases and because there were fewer cases. One analysis with the 6-12 schools combined with the 9-12 schools is, however, reported in the results section (where configuration itself is a variable in a prediction equation).

For the focal 9-12 schools (n=168) comparisons of means were computed for size (smaller vs. larger planned enrollment) in order to address the first research question To address the second research question, stepwise regression analyses were conducted on three dependent variables (total cost, cost per student, and cost per square foot) with, in each case, nine predictor variables. The predictor variables were (a) total planned square feet, (b) planned enrollment, (c) average district enrollment for 1997-2001, (d) average district revenue per student for 1997-2001, (e) proportion of

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6   The 9-12 configuration comprises 11,385 of 17,470 schools with grade 12 the highest grade, based on analyses by the author of 2001-02 CCD data; 3,960 such schools had lowest grade lower than grade 9. Approximately 900 schools are K-12 or 1-12 schools. Senior high (10-12) schools are now less common than in previous decades.

adult population 25 and older who were high school graduates in 2000, (f) percent of district families with children living above the poverty line in 2000, (g) percentage of students in the school who were African American (natural logarithm transform), (h) planned completion date, and (i) rurality (rural=1). The proportion of the study cases by locale is close to those given in the CCD for extant high schools of the sort studied (i.e., 49.4% vs. 50.8%). Total cost was used as a predictor variable in the regression for square feet per student, where the values of the variable were divided by 1,000,000 to render the regression coefficient interpretable. Predictor variables that were used to calculate the dependent variable (e.g., planned enrollment in the case of cost per student) were of course eliminated from the predictor variable set for the relevant equation.[7] The data were the most recent that could be obtained at the time of the study—varying from 1997 to 2001, depending on the variable.

LIMITATIONS

The match procedure probably does not provide perfect matches; but the initial error rate was quantified, steps were taken to reduce it, and confirmation was sought from schools that appeared to be likely matches (see Appendix A). A more comprehensive and carefully prepared data set would enhance future research efforts substantially (see recommendations).

Generalization from the data set to the nation as a whole seems reasonable for two reasons. The cases are not a random sample but instead constitute the *majority of the universe* of newly and recently constructed schools of this sort. Second, 30 states are represented among the cases. The nature of reality (non-random nature of construction efforts) nonetheless suggests the need for caution.

Generalizations to rural and suburban locales also seem warranted, on a similar basis and with similar caution. Generalizations to cities, however--particularly large cities--are by no means warranted (see Table 2, below). The data set contains just one case from a large city (9 would be expected by chance), and, within a data set of this size, 6 cases rather than 3 would be expected from the mid-size city locale.

RESULTS

Table 1 presents descriptive statistics (mean, standard deviation, and skewness) for 16 selected variables of interest. First, in Table 1 the mean planned and actual enrollments of these high schools are identical, though actual enrollments are predictably more variable than planned enrollments. Second, costs per square foot in this 8-year data set

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7   Variables in the predictor set that were used to compute any of the dependent variables were excluded from use as predictor variables in that analysis, as follows: (a) Total feet square per student was excluded as predictor variable in the regression that used cost per square foot as the dependent variable; (b) total planned enrollment was excluded as a predictor from the regression for cost per student; and (c) both square feet and planned enrollment were excluded as predictors from the regression for square feet per student.

are consistent with those reported by Abramson for 2003 only, with $108 cited there as the national median cost per square foot for new high schools planned to enroll fewer than 850 students (cf. Abramson, 2004). Third, and relatedly, the restrictive selection rules used to create this data set (unique zip code, high school unique in district) did *not* produce sharply different means on cost as compared to information reported by Abramson. Fourth, rural schools (CCD locale codes 7 and 8) comprise about half the sample (compared to the national prevalence of about 30%). Our selection rules are doubtless responsible for this difference because on average rural schools fit this profile (enrollment under 1,000) better than other schools. Fifth, the fact that the cost per square foot means reported by Abramson (2004) and by the present study are so close might arguably be interpreted as further warrant for generalizability to the nation as a whole.

Table 1, Descriptive Statistics for Selected Variables, 9-12 Schools

variable	mean	SD	skewness
planned enrollment	590	203	- 0.12
actual enrollment 01-02	589	364	+ 0.19
planned cost	$12,795,140	$8,290,367	+ 1.79
planned ft^2	122,722	57,138	+ 1.02
planned cost per ft^2	$102.43	$40.74	+ 1.82
planned cost per student	$21,508.58	$10,792.78	+ 1.41
planned ft^2 per student	215.49	85.70	+ 0.94
school subsidized meal rate	25.93%	17.88%	+ 1.17
school percent minority	14.98%	21.08%	+ 2.11
school percent African American	6.28%	14.46%	+ 3.71
district adults w/at least HS grad	35.02%	7.37%	- 0.22
instructional expend per student	$4,065.31	$668.38	+ 0.85
district revenue per student	$7586.95	$1,601.68	+ 1.48
district membership	2,791	4,710	+ 6.65
district families above poverty line	89.59%	8.36%	- 1.57
rurality (1= rural)	.49	.50	+ 0.24

note 1. n =168 schools from 30 states (AL, 4; CA, 1; CO, 5; CT, 2; DE, 1; GA 9; IA, 2; ID, 5; IN, 1; KS, 2; KY, 5; MA, 3; ME 1, MI, 24; MS, 7; NC, 1; NE, 3; NH, 2; NY, 1; OH, 27; OK, 3; OR, 2; PA, 4; SC, 1; TN, 11; TX, 33; UT, 2; VA, 1; WA, 2; WV, 3)

note 2. The minimum planned enrollment was 138 and the maximum 962.

Table 2 reports the CCD locales for all 9-12 schools in the data set. The CCD data in Table 2 represent the prevalence of schools of the sort planned for construction in this data set. For 2001-2002, there were 6,795 regular 9-12 high schools in the U.S. enrolling fewer than 1,000 students. The universe of such schools cannot be interpreted as a guide for the representativeness of the study data set simply because some states have active programs, whereas others are relatively inactive. Nonetheless, the two data sets show surprisingly similar distributions, with the exception of cities. Generalizability to the nation as a whole seems at least arguable.

First research question

Are planned costs of construction equal for smaller as compared to larger high schools planned to enroll 1,000 or fewer students? Table 3 reports cost comparisons, with schools divided into two groups—smaller and larger—at the median of planned enrollment. For each group, means and standard deviations are reported for a number of variables of interest, in addition to cost. Three of the four cost-related variables exhibit statistically significant differences. By comparison, not one of the six contextual variables exhibits statistically significant differences.

Table 2, Number of Schools by Locale, 9-12 High Schools

Locale	Study Cases N	Study Cases Pct.	CCD Universe N	CCD Universe Pct.
large city	1	0.6	375	5.5
mid-size city	3	1.8	222	3.3
fringe large city	23	13.7	803	11.8
fringe mid-size city	16	9.5	521	7.7
large town	0	0	21	0.3
small-town	42	25.0	1375	20.2
rural (nonmetro)	42	25.0	2406	35.4
rural (metro)	41	24.4	1045	15.4
missing	0	0	27	0.4
Total	168	100	6,795	100

note. CCD cases represent universe of 9-12 schools enrolling fewer than 1,000 students.

Table 3, Cost Differences, Smaller as Compared with Larger 9-12 Schools, Planned Enrollment Basis

variable	smaller schools (n=87) mean	SD	larger schools (n=81) Mean	SD
planned enrollment****	426	118	767	100
actual enrollment (01)	487	359	699	338
planned cost****	$9,530,127	$5,570,334		$9,277,583
cost per ft^2**	$95.73	$35.89	$109.61	$44.48
cost per student	$22,171.65	$11,332.37	$20,796.40	$10,203.66
ft^2 per student****	238.94	98.62	190.32	60.30
state rev per student	56%	15%	54%	14%
rurality	.49	.50	.49	.50
high school grads	34%	8%	36%	7%
district mdn fam inc	$46,465.69	$12,158.86	$48,662.81	$12,370.11
percent fam nonpov	89%	8%	91%	8%
dist revenue per stud	$7,490.05	$1,612.59	$7,688.62	$1,593.79

note 1. ****$p<.0005$; ** $p<.01$; * $p < .05$

note 2. Schools divided on median of planned enrollment, i.e., 600 students.

note 3. Schools from 27 states represent smaller schools (36 of 87 cases from MI and TX).

note 4. Schools from 18 states represent larger schools (31 of 81 cases from MI and OH).

What do the results in Table 3 suggest? With respect to costs, smaller schools are less expensive than larger schools per square foot, but they cost the same per student as larger schools. Further, the smaller schools in this data set allocate 26% more space to each student as compared with the larger schools. Conservatively, one can conclude that smaller high schools are not, in general, more expensive to build new than larger high schools, within the enrollment limits set by the study.

Second research question

How do construction costs vary in light of contextual variables including planned enrollment, square footage, district revenues, locale, socioeconomic conditions, and ethnicity? The study approached this question via a series of regression analyses that employed a uniform set of nine predictor variables (exceptions described previously).

The analyses regressed four dependent variables on this set of predictors: (a) total cost in dollars, (b) cost in dollars per square foot, (c) cost in dollars per student, and (d) total feet square per student.   In all cases, the analyses were conducted as stepwise regressions.

Table 4 reports the results for the regression analyses. Panel 1 reports results for total cost, panel 2 for cost per square foot, panel 3 cost per student, and panel 4 square feet per student. Information about only the final step of the regressions is reported

in Table 4. For all regressions, however, every applicable predictor was specified for possible entry (except as noted previously).

Only for the total cost equation does a regression model account for most of the variance in the dependent variable (76% in the total cost equation given in panel 1, with total square feet accounting for most of the explained variance). For the other three cost-related equations, the combined influence of all independent variables accounts for less than half the variance (40% for cost per student; 25% for cost per square foot, and 23% for square feet per student). No equation, however, accounts for a trivial amount of variance, always a possibility in an unexplored field of education research.

For the total-cost equation (panel 1), which includes five of the nine predictor variables as statistically significant, the most of any of the four equations, square feet alone accounted for 68% of the variance in cost (β = .80). Every thousand square feet increased mean total cost by about $115,000 ($115 per foot times 1000), with other (much more minor) influences controlled. Except for end date (interpretable as inflation), the other variables reflect community wealth, which tended to increase cost (rural areas are poorer on average than non-rural areas). Notably, planned enrollment exerted no influence residual of those appearing in panel 1.

Table 4, Regression for Variables Predicting Costs for 9-12 Schools

Panel 1: Total Cost in Dollars

variable	B	s.e. B	β	t	p
square feet	115.122	5.08	.800	22.662	.000
end date	758,036.90	139217.05	.191	5.445	.000
revenue per student	704.89	170.29	.146	4.139	.000
Rural	-1,498,198.82	575,478.73	-.091	-2.603	.010
families above poverty line	82,402.92	35,708.28	.081	2.308	.022

note. First step adjusted R^2 = .68; ΔR^2 from first to fifth step = .08; fifth step adjusted R^2 = .76

Panel 2: Cost in Dollars per Square Foot

Variable	B	s.e. B	β	t	p
end date	5.380	1.237	.273	4.348	.000
revenue per student	.006	.001	.271	4.366	.000
planned enrollment	.027	.012	.138	2.197	.029
families above poverty line	.674	.314	.133	2.143	.033

note. First step adjusted R^2 = .12; ΔR^2 from first to fourth step = .13; fourth step adjusted R^2 = .25

Panel 3: Cost in Dollars per Student

Variable	B	s.e. B	β	t	p
square feet	.102	.010	.541	9.938	.000
revenue per student	1.703	.344	.269	4.948	.000

note. First step adjusted R^2 = .33; ΔR^2 from first to second step = .07; second step adjusted R^2 = .40

Panel 4: Square Feet per Student

Variables	B	s.e. B	β		
million dollars of planned cost	4.304	.646	.412	6.666	.000
end date	-14.112	2.565	-.340	-5.502	.000

note. First step adjusted R^2 = .12; ΔR^2 from first to second step = .11; second step adjusted R^2 = .23

Cost per square foot (panel 2) was predicted by four variables, most strongly (β = .27) by end date (inflation factor) and revenue per student (β = .27) combined. Every additional year for completion date was associated with a \$5.38 increase in mean cost per square foot (an inflation factor of about 5%), and every \$1000 of additional revenue per student increased cost per square foot by about \$6.00. Weaker influences were planned enrollment (β = .14) and percentage of district families with incomes above the poverty line (β = .13). Every increment of 100 students of planned enrollment increased mean cost by \$2.70 per square foot and every 10% change in the proportion of families above the poverty line increased cost per square foot by an estimated \$6.70. The fact that planned enrollment increased cost per square foot, all else equal, is contrary to the conventional wisdom that larger enrollments produce economies of scale.

Cost per student (panel 3) was predicted by square feet and by revenue per student. Building footprint, again, exerted much the stronger influence (β = .54), but with that influence controlled, district funding affluence separately influenced cost per student (β = .27). Again, size (in this case measured by square feet) increased cost per student, all else equal: Every 100 additional square feet increased mean cost per student by about \$1.00. With respect to the influence of revenue per student, one might hypothesize that, whatever the building footprint, decision makers in more affluent communities purchase more costly amenities (quality of flooring, facade treatment, HVAC options and so forth). Every \$1000 dollars of additional revenue per student increased mean cost per student by \$1.70.

Square feet per student (panel 4) was predicted by two variables of approximately equal influence, million dollars of planned cost (β = .41) and end date (β = -.34). Each million dollars of planned total cost was associated with an additional 4.3 square feet per student (i.e., a larger footprint is, not surprisingly, more expensive than a smaller footprint). In this equation, end date was uniquely, and perhaps surprisingly, associated with a reduction in square feet per student of approximately 14 square feet per student. All else equal, this finding could indicate that one way planners have countered rising total costs is to reduce the footprint of schools, and this reduction over time would

logically translate into a reduced space allocation per student.

One additional regression analysis relevant to the second research question was possible, using high school grade-configuration type (9-12 or not 9-12) as a predictor variable. This analysis used cost per student as the dependent measure, in view of the importance of that variable to planners. Cost per square foot (results not reported) was not significantly influenced by high school type, but cost per student was. Table 5 reports the results.

With 6-12 schools represented in the data set and with a dummy variable for high school type (9-12 school = 1), four variables predict cost per student in the combined data set. In contrast to the regression reported in panel 3 of Table 4, both rural and 9-12 schools enter the equation as significant predictors, explaining slightly more total variance (42% vs. 40%). Both variables tend to reduce cost per student, but their unique influence in this regard is comparatively weak (i.e., together they explain an additional 2% of the observed variance in cost per student, once the strong influence of square feet and revenue per student is taken into account).

Table 5, Regression of Cost per Student for 9-12 and 6-12 High Schools

Variable	B	s.e. B	β	t	p
square feet	.105	.011	.554	9.950	.000
revenue per student	1.708	.345	.269	4.952	.000
9-12 high school	-3719.051	1524.72	-.137	-2.439	.016
Rural	-2591.732	1193.45	-.120	-2.172	.031

note 1. n = 206 due to missing data
note 2. First step adjusted R^2 = .33; ΔR^2 from first to fourth step = .09; fourth step adjusted R^2 = .42
note 2. dummy variable values: rural = 1; 9-12 high school =1

note 3. 78% of the 6-12 schools (n=41) were located in rural places; mean district membership was 1,925 (SD=2,738); mean enrollment was 496 (SD=219); and mean total cost was $11,689,487.

DISCUSSION

Are planned costs of construction equal for smaller as compared to larger high schools enrolling 1,000 or fewer students? Once the decision is made *not to build very large schools*, contracted costs for larger and smaller high schools cannot be said to vary appreciably, based on findings from this study. The findings show that the smaller half of these 9-12 schools (planned to enroll from 138 to 600 students) were, on average, no more expensive *per student* to build than the larger half (planned to enroll 601-999 students) and were less costly per square foot ($96 vs. $110, significant at p < .01).

One detail from Table 3 deserves particular attention. Smaller planned schools (enrollment basis) projected an average enrollment of 426 students, but subsequently

enrolled more students, 486 on average. Larger schools (enrollment basis) projected an average enrollment of 767 students, but subsequently enrolled fewer students, 699 on average. In other words, planned costs per student of the smaller schools were, on average, overestimated, whereas planned cost per student of the larger schools were, on average, underestimated.

The second research question examined the variation in planned construction costs related to context. It asked, in essence, "What *does* predict cost among these 9-12 high schools?"

Total cost was well predicted (explaining 76% of variance) by four variables, with footprint (total square footage) accounting for nearly 90% of the explained influence (i.e., 0.68/0.76). Rural location tended to reduce costs, whereas the other predictors were associated with increased costs. Contrary, perhaps, to conventional wisdom, planned enrollment exerted no separate influence.

Cost per square foot was less well predicted (25% of variance) by: (a) inflation (construction end date), (b) local revenue wealth, (c) planned enrollment, and (d) proportion of families not living in poverty. Contrary to conventional wisdom, planned enrollment (all else equal) tended to *increase* cost per square foot, all else equal, consistent with Azari-Rad and colleagues (2002).

Cost per student was more fully predicted than cost per square foot, with 40% of the observed variance accounted for by just two variables, footprint and local revenue wealth. All else equal, schools with larger footprints and wealthier clientele cost more per student. The effect of enrollment could not be separately assessed, of course, because planned enrollment was used to construct the dependent variable. The study also found that 9-12 (as opposed to 6-12) configuration and rural location exerted weak *negative* influences on cost per student.

Square foot per student. The space allocated per student was predicted by planned cost and end date. Not surprisingly, all else equal, more space costs more money. A surprising finding was that schools completed later allocated less space (14 square feet less) per student. This might indicate that one way that planners attempt to control costs is by reducing footprint size, all else equal.

RECOMMENDATIONS

Given the findings, this report makes recommendations for the practice of planning high schools of appropriate—educationally productive—size. It also poses recommendations for researchers' consideration. The recommendations for practice are more numerous because entrenched misconceptions, firmly lodged in policy, have made it difficult to plan smaller schools as new construction.

Recommendations for practice. The nine recommendations that follow address school board members, community advocates, school administrators, and legislators and their staffs. These recommendations extend the findings of this study to the issues of practice related to building and operating schools; that is, the broadly applicable research and policy context is taken into consideration in their formulation. The recommendations follow:

1. Be comparatively confident that within the range of educationally productive high school size (9-12 enrollment under about 1,000 students), larger schools are not less costly to build than smaller ones (and vice-versa).
2. Understand that the influence of existing state regulations pushes local planning efforts towards the construction of larger schools (Lawrence, 2001).
3. Join with one another to modify the application of state regulations governing school size, to win variances from such regulations, and, finally, to get them changed.
4. Create long-term plans at state and local levels that permit construction to occur during economic downturns (Azari-Rad et al., 2002) as the most effective way to minimize construction cost.
5. Do not expect operating-cost savings from consolidation. Existing studies of operating costs show no significant difference before and after consolidations (e.g., Schwinden & Brannon, 1993; e.g., Streifel *et al.*, 1991). Making this argument to win the support of taxpayers is not simply to mislead the public, but to manipulate it.
6. For further counsel on operating costs of smaller schools, see the work of Lawrence and colleagues (2005, 2003).
7. Build schools of an appropriate size for the community. No one size is best. The appropriate size depends on circumstance (see #8).
8. Peg school size to community poverty level, building smaller schools in more impoverished communities. Very small high schools (fewer than 200 or so students) are appropriate in some circumstances.
9. If planning a 9-12 school smaller than about 600 students, let stakeholders know that available research (this study) suggests your enrollment projections may be an underestimate, and that underestimates of student enrollment result in overestimates of cost per student.

A key part of the challenge confronted by planners who, contrary to conventional wisdom, want to build smaller schools is how to deal with the deformations, mistaken opinions, and manipulative practices lodged in the conventional wisdom. The forgoing recommendations show the range of possibilities for action.

Recommendations for research. Newly constructed smaller schools come into being *qua* new schools because they are purposively planned that way. Unfortunately, as Lawrence's review (Lawrence, 2001) shows, conventional wisdom about size deforms the planning process in ways that lead construction planners to plan larger rather than smaller schools, at just the time when smaller schools are apparently widely (though not universally) needed. Actual research about the relationship between school size and construction costs is shockingly—irresponsibly—thin, and given the substantial financial interests involved, a few recommendations seem overdue to guide future scientific research (i.e., systematic studies defensibly careful about conceptualization, validity, and responsible with the interpretation of results). Five such recommendations follow:
1. State agencies and especially the federal government (the National Center for

Education Statistics in particular) should start now to build large databases describing the universe of new school construction projects in respectable detail. New buildings should be the initial focus.

2. Such databases should be designed with significant counsel from education researchers interested in the costs and benefits of schools of varying sizes.

3. Research about this issue is at present driven by a practical concern, not a theoretical one—namely the concern to increase the number of smaller schools. This position has defensible empirical warrant, and research into cost of new construction should acknowledge the fact.

4. Research designs and data collection should (as a result of #3) focus on the plans and the planning process, because the planning episode is when the decision to build schools of one size or another is taken (at present, usually resulting in larger rather than smaller schools, and often in schools too large to be educationally defensible). This may be the most critical research recommendation since it embeds the salient ontological necessity (i.e., planning shapes the events under scrutiny).

5. Research designs should address state planning issues and issues of local political, economic, social, and historical context. Rural and urban construction projects, for instance, face sharply different challenges (e.g., new consolidations and altering of existing megaschools, respectively).

These recommendations for research and practice indicate a bare-bones beginning of a research effort that has been needed to support wise practice. The effort is decades overdue but has remained strangely unengaged by both the government and independent researchers. This study, now one of two scholarly, peer-reviewed efforts to engage the needed work, was enabled by a very small allocation from two private foundations.

In the view of the present author, this very modest level of funding demonstrates that critically useful research can be accomplished frugally by independent researchers. The funding also enabled a group of researchers, advocates, and practitioners to assemble for discussions; the construction database accessed and augmented by this study was a result of those interactions.

Lack of resources would therefore seem an unsatisfactory explanation for the durable silence of government and independent researchers. Why has this sorely needed research effort not been engaged? As noted in the literature review, school construction is big business. And the bigger is the school, presumably the bigger is the business. Such opinion, however, may be as much an illusion as the lower cost of larger schools. Perhaps architectural and construction firms that learn to build small schools will succeed by addressing the needs of an emerging market.[8]

One hopes the tide of opinion about the need for smaller school and the feasibility of constructing them new may be changing, but opinion will always need to be examined

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8   Architects of Achievement and Concordia have been involved in the design and construction of smaller schools. They can be located easily on the web. Other firms with an interest in helping communities to build smaller new schools may exist.

and doubted and challenged. There is no final word on any of these matters. Thoughtful practice is the overall aim, and a mere opinion is insufficiently thoughtful. Continued research is essential for this reason.

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APPENDIX A

Test Match Process

The test matching was done with 40 cases selected at random from the dataset, with matches attempted on the basis of zip code, educational level (elementary, middle, and high school), and planned enrollment. When all 40 cases had been matched in this tentative way, phone calls were placed to the school identified in the CCD (using the "matched" school's phone number as listed in the CCD). Four schools could not be reached on repeated attempts because phone numbers were incorrect. We asked a series of questions to arrive at the judgment of probable match, with the key question asking if the school had experienced substantial new construction in recent years (additions, renovations, or if the school were newly constructed). We also asked about the nature of the substantial new construction.

In 28 of the 36 remaining cases (78%), the success of the matching effort seemed probable based on answers provided by interviewees. Although the construction data set had identified *all* cases as new construction, in fact our respondents reported that only 60% (n=17) were newly constructed schools. Interviewees at the other schools reported a substantial variety of projects including new roofs, new heating and air conditioning installations, portable buildings, and additions. Interviewees were never in any doubt about whether their school had been newly constructed within the past 10 years or not. Taken together, the encouraging news (arguable 78% match rate on the test) and the bad news (40% of cases not new construction) seemed to point to the need to devise an improved match strategy. Such an improvement would be likely, it seemed, if the study could restrict the number of CCD schools presented for matching.

What might accomplish this restriction efficiently in the case of high schools? Cases with zip codes that were unique among schools in the basic data set would do so; this provision would seem to reduce (but not eliminate) the probability of one school within the zip code being confounded with another.

Applying the relevant selection rules to cases in the source data set (i.e., high school level only, unique zip code in source data set, enrollment less than 1,000) 296 cases of the 803 total high school cases were drawn (note that this is a *purposive*, not a random, sample).

Post-draw, one additional selection rule was imposed to improve the accuracy of matches. Based on zip code of school and corresponding district, we excluded 12 cases where the district with the same zip code as the school operated more than two

high schools. In another 12 cases, no likely match was evident. Additionally, 3 cases also were excluded because of evidently erroneous information in the basic data set (e.g., zip code mismatch with state—that is, the state in the case record did not contain the zip code given for the school). The remaining 269 cases from the source data set exhibited prospective matches with schools in the CCD—based on matching zip code and enrollment (planned enrollment in the source data set and actual current enrollment in the CCD). Attempts were made to reach all 269 schools, including multiple calls over a span of three weeks. At the end of that time (May, 2004), calling was discontinued as further effort yielded no additional contacts. The study had contacted 244 schools.

In making telephone contact, they study posed two questions to respondents: (a) Is this the only high school in the district? and (b) Was this high school newly built within the past 10 years? Of the 244 schools contacted, 79.1% (193) were the only high school in their district and 86.5% (211) were newly built schools. Table A-1 provides the relevant crosstabulation.

The cross tabulations in Table A-1 also provide confirmation of the success of the purposive sampling rules in identifying newly built schools. For districts in which the contacted high school was not the only high school, respondents at 35% (as compared to 40%) of matched schools contacted denied that they had been newly built. For high schools unique to their operating districts, however, respondents at only 8% of schools contacted (15 of 193) made this denial. With this information in hand, the study determined to perform analyses *only* on schools that were confirmed new construction regardless of whether or not the schools were the only high schools in their respective districts.

Table A-1
Answers to "Two or Fewer High Schools in District" and "Newly Built School"

only high school in district?	newly built high school?		
	no	yes	row total
yes	15 (6.1%)	178 (73.0%)	193
no	18 (7.4%)	33 (13.5%)	51
column total	33 (13.5%)	211 (86.5%)	244

IMPROVING READING SKILLS OF SECOND GRADE STUDENTS: INTEGRATING ACCOUNTABILITY AND ASSESSMENT IN ELEMENTARY SCHOOL READING INSTRUCTION WITH A PRESERVICE TEACHER EDUCATION CLASS

Eleanor V. Wilson
Meghann Dellinger
Ashley Green, Jaclyn Murphy
Melia Hatfield, Courtney Long, Victoria Fantozzi

ABSTRACT

This paper discusses issues of accountability and assessment in elementary education from three perspectives: (a) improving struggling second grade students' reading ability; (b) providing pre-service elementary education students with the opportunity to assess student needs, design instruction, and evaluate gains for the efficacy of instruction; and, (c) addressing state and national licensure standards for future teachers, which require the ability to assess student needs, design instruction to meet these needs, and then to assess instruction. The paper summarizes the ways in which these three perspectives influenced the development of a school/university reading program and the importance of balancing these aspects as one plans for such a collaboration.

RATIONALE

Unarguably, learning to read is central to student success in schools. When young children are unable to begin reading successfully in the early grades, they frequently loose ground academically, ground they fail to make up during their school years (Morris, 1999). One way to address the need for additional reading support in the early grades is through the use of volunteer tutors, either from the community or from teacher preparation programs, to work with children individually (Adler, 1999; McKenna, 2000; Johnston, et al., 1998; Jones et al., 2004).

Similarly, future teachers need to learn the basis for effective reading instruction and have the opportunity to apply these fundamental basics and assess their efficacy while working in supervised field placements (Darling-Hammond, 2007). State and national licensing agencies also require future teachers to learn, and apply appropriate assessment strategies to use in instruction and diagnosis for student achievement. Finally, teacher education programs must consider ways to measure the effects of their reading tutorial programs led by pre-service students to provide feedback for cooperating schools. Attempting to create a venue to address these goals opens the door to several issues.

BACKGROUND

For the past five years, pre-service elementary students (tutors) have been enrolled in a tutoring program designed to work with struggling second grade readers (tutees) in a local elementary school. Approximately forty university students are divided in groups of 10-12 meeting weekly with a cohort of 10-12 second grade students. They

meet Monday through Thursday from 8:00 a.m. to 9:30 a.m. for a minimum of 10 reading tutorial sessions during a semester; thus the tutees potentially have thirty to forty hour-long sessions with tutors during the semester, barring excessive absences

As it is easy to see, the logistics of organizing such a program present challenges: timing sessions for maximum instructional effectiveness for the tutees, initial pedagogical instruction for tutors, provisions to measure progress with tutees, ways to organize tutoring sessions for maximum effectiveness for tutees, and ways to communicate daily work of tutees between tutors. While changes have been made during the past five years of program implementation, certain aspects of the program remain the same: the initial and ongoing instruction for pre-service teachers, and the content of the tutorial sessions, which include daily monitoring of fluency, directed reading instruction, word study, and writing. Tutors keep daily journals of the work with their tutee, which serve as a record for other tutors assigned to their tutee and also for each tutors' final field reports.

PROCEDURES

The program described in this discussion was first implemented in 2003.[9] The tutees eligible for this program are identified based on results from the Woodcock-Johnson Reading Inventory (2001). The pre-service students are enrolled in a Fundamentals of Reading class during the same semester they are tutoring, although the tutoring placement does not officially serve as a field experience for the class. The pre-service students are assigned two texts to use during the semester accompanying the tutoring: Duffy, *Explaining Reading* (2003) and Cunningham, *Systematic sequential phonics they use: Learning phonics through word wall and making words* (2000).

Tutoring sessions are led by the faculty member of record, a graduate student, and the elementary school principal. Pre-service students are supervised by the elementary school principal and at least one graduate instructor from the University. Each morning pre-service students are provided with an overview of the day's activities (based on Duffy and Cunningham selections) along with a lesson plan and the records of the previous tutors' work with the children.

The sessions begin with a time for tutors to review previous work of their tutees, to complete plans for the day, and to discuss and model the assigned parts of the Duffy and Cunningham texts. Sessions begin and end with a timed reading from *Quick Reads* (Pearson Learning, 2003), providing systematic documentation of fluency (as measured in Words per Minute, WPM), and then including reading for comprehension and word study, and concluding with a writing sample if time allowed. The WPM component was added after the first year to serve as one way of measuring tutee progress as well as providing the tutors with a useful diagnostic tool. Over time, we have found that the data collection (WPM) provides concrete documentation for both tutors and tutees

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9   This paper discusses five groups of tutors working in the program between 2003 and 2007 (N= 40/per year, or 200) with 5 groups of second grade students (N= 10 per year, or 50); numbers are averages and differed slightly each year.

and served to motivate both groups of students as they worked on improving reading skills.

FINDINGS

Initially, the focus was on providing a placement where tutors could apply varied reading strategies working with tutees, who were struggling readers. From the outset, documenting each day's work and communicating this information from tutor to tutor was critical. Analysis of records kept in the first year of the program showed that while tutors felt a sense of accomplishment with their tutees, they needed more specific evidence of the kinds of gains they were, or perhaps were not, making. The researchers also were cognizant of the need to introduce pre-service students to formal assessment strategies as part of their licensure requirements, and introducing record keeping in the form of WPM was a useful way to do this. The final compilation of WPM scores also gave the school a profile of tutee progress.

Content analysis of the first year's cohort of pre-service projects provided a picture of 'cycles' through which all subsequent groups went (Dellinger, 2004; Green & Murphy, 2005; Hatfield, 2006; Long, 2007). Tutors' reports showed that after the initial enthusiasm, along with some confusion about expectations, wore off, there was a dip in attitudes as well as in tutee gains made during the early sessions. Tutees were frustrated by reading aloud and anxious to become better readers. After this period of the first four weeks, tutees became comfortable working with their tutors, and by the time of the sixth session, both tutors and their tutees reported feeling more confident about ability to spell and to read aloud. Parents informally reported seeing changes in their child's attitudes towards reading. A more productive trend appeared for the last 4 or 5 sessions, perhaps due in part to the timing of several school and university breaks!

Tutors report feeling confident about their instructional preparation; their strongest area of concern over time continued to be tutee's motivation, which manifests itself in behavior problems such as inattention and refusing to do work. Tutors have asked for more classroom management instruction to work with this. Tutors also expressed a desire for more specific observation on the part of university supervisors, although this was of key importance for all of us each day.

With few exceptions, tutors identified areas in which they grew in self-confidence and reasonable progress with their tutees. Informal feedback from the participating school (Stavitski, 2004) indicated the tutees made gains to place them at the same reading level as their peers, but as noted below, there has been no systematic study of long-term gains as measured in standardized tests.

The most important programmatic change was made after the first year when tutors reported uncertainty about the kinds of gains their students were making. Introducing a way to measure fluency (WPM) provided more direction in subsequent years. The use of data to guide tutoring sessions gave evidence of effective intervention strategies used over the semester and showed that the majority of tutees made gains in reading fluency and improved their reading comprehension level.

While attempting to refrain from quoting too much from the tutors' final case studies, the following one reflects the tenor of many:

I feel that with my guidance, my student made progress over the course of the semester. Although, according to the pre and post spelling assessments we took throughout the semester, he only made minimal progress with regard to spelling skills, I consider this only one piece of the bigger puzzle. His writing skills definitely improved. He began to put a period at the end of one thought before going on to another thought. He also became more apt to start his sentences with capital letters. [Although his frequency/WPM improved], he needs to continue to practice working on his fluency and intonation. In addition, he also could benefit from continued instruction of reading comprehension and vocabulary strategies. This semester of tutoring has been so rewarding for me, and I know based on observable results that it was also rewarding for my student.

This response illustrates the central goals of the tutoring experience: to provide pre-service students with opportunities to design and assess instructional strategies based on analysis of relevant data.

DISCUSSION

Research on pre-service tutoring programs with elementary school children is conflicting: in most cases, the effects for the tutors are positive, and they report their instructional skills for working with children individually are enhanced (Jones et al., 2004; Rogers-Haverback, 2005). The tutors participating in the program described here have reflected these findings in terms of overall increased self-confidence about their abilities to diagnose and remediate instruction with struggling readers.

Determining the gains made by the tutees is more of a challenge. It certainly stands to reason that after a semester's experience in the reading tutorials the tutees would have made gains, but how to measure the lasting effects is a question debated by researchers and policy makers (Jones et al., 2004). It is possible to document the tutee's growth in reading based on end-of-semester fluency scores, but a more comprehensive analysis of long-term programmatic effect is needed.

The unanticipated aspects of creating programs such as this are considerable, and obviously reflect and affect the need for constant course evaluation and flexibility in planning for all who are involved. Course instructors need to confer with school personnel at length about the school's needs, remediation programs already in place, ways to identify students for tutoring programs, such as the one described here, ways to evaluate the programs, and ways to help with supervision. It is as critical for placements such as this to meet the needs of the school and the tutees, as it is to meet the programmatic needs of the tutors' course of study. It's not an easy task to provide the placement of over forty tutors working with tutees weekly over the span of a semester. Collaboration in the truest sense of the word is essential as is on-going communication about the work being done.

This paper really is a discussion of a 'work-in-progress' as much as it analyzes data from a tutoring program. Hopefully this paper will encourage conversations with other

schools and teacher education practitioners about ways they have found to address the challenges of creating field placements that enhance both pre-service students' teaching and elementary children's learning (Jones et al, 2004). With the added importance placed in reading instruction nationally,[10] programs such as this also answer the need for accountability in teacher preparation. Creating, sustaining, and evaluating programs such as this require willingness to cooperate and adjust and be flexible on the part of the elementary school as well as on the part of the university instructor. Benefits for the children involved are of course the most critical piece of any program, but benefits for the future teachers in terms of using data successfully to guide instruction and then assess the effectiveness of their instruction is equally important.

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