

TEACHERS' STAGES OF CONCERN ABOUT A SCHOOL-WIDE
EDUCATIONAL REFORM

by

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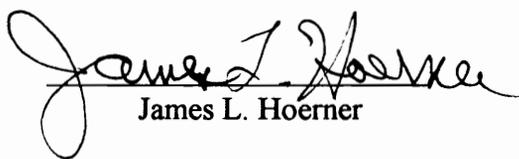
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(ABSTRACT)

This study sought to verify the stages of concern theory according to Hall, Wallace, and Dossette (1973), using a school-wide educational reform. Furthermore, changes in teachers' concern profiles as a function of education levels, teaching areas, hours of reform-related training, and adoption-proneness were studied. In particular, teachers' concern profiles about implementing the High Schools That Work (HSTW) reform in Virginia were studied.

One thousand two hundred and seven teachers in 19 sites implementing the HSTW reform in Virginia participated in the study. Of the purposive sample of 1207 teachers to whom study questionnaires were forwarded by mail, 674 responded and returned their questionnaires. The questionnaire consisted of three sections: the Stages of Concern section (Hall, Wallace, & Dossette, 1973), the Adoption-proneness section (Oscarson, 1977), and the demographic information section. Data were analyzed, using descriptive statistics and multivariate analysis of variance procedures ($\alpha = .05$).

Results revealed that teachers with no HSTW reform experience ($N = 131$) had highest concern at the personal stage, followed by teachers in their first year of experience ($N = 207$), and teachers in their second year of experience ($N = 230$). Teachers in their third year of experience ($N = 70$) revealed the least concern at the personal stage. There

was significant change in teachers' concern associated with amount of experience $F(21, 1880) = 12.32, p = .00 (p < .05)$. Teachers with more experience had peak concerns at the consequences and collaboration stages while teachers with less experience had peak concern at the personal stage. Results agreed with the theory which states that as experience in reform use increases, concern moves from informational and personal stages to consequences and collaboration stages.

Change in teachers' concern as a function of education level was significant $F(28, 2502) = 2.09, p = .001 (p < .05)$. Teachers with doctoral degrees, followed by those with 30 credit hours above the master's degree, revealed more collaboration concern than teachers with associate, bachelor's, and master's degrees. Concern change due to teaching area was not significant $F(7, 630) = 1.81, p = .08 (p > .05)$. The concern profiles of vocational and academic teachers were parallel and coincident, but not level. Teachers' concern change as a function of hours of related training was significant $F(14, 1256) = 12.12, p = .00 (p < .05)$. Teachers with no reform-related training had peak concern at the personal stage while those with more than 15 hours of training had peak concerns at the collaboration and consequences stages. Teachers who had 15 hours or less of training had lower personal concern than those who had no training, but higher than those who had more than 15 hours of training. Teachers' concern as a function of adoption-proneness was significant $F(7, 630) = 14.53, p = .00 (p < .05)$. While all the teachers revealed similar informational, personal, and management concerns, teachers who were more adoption-prone had more intense concern at the consequences and collaboration stages.

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TEACHERS' STAGES OF CONCERN ABOUT A SCHOOL-WIDE EDUCATIONAL REFORM

Chapter One

Introduction

Background of the Study

Concerns organization members have about innovation, reform, or change relate to the influence of interaction between individual members and the organizational environment (Lewis & Seibold, 1993). According to Lewis and Seibold (1993), rules and resources that organization members use to sustain their organization affect their concern and how they perceive innovation, reform, or change. These organizational environments influence the perceptions, feelings, and concern of users about reform and innovation (Lewis & Seibold, 1993). Specialization, administrative intensity, and implementation activities, as well as work units and divisions, influence the adoption process. Variation in users' characteristics such as education, experience, age, and expertise contribute to variation in their innovation perceptions and concerns. In addition, users' characteristics and perceptions ultimately relate to their involvement in innovation use.

Innovation users' interactions with an organization's internal and external environments affect their perceptions (Lewis and Seibold, 1993). Perceptions that users have about an innovation, in turn, can influence their concerns about implementation. Furthermore, their personal characteristics can influence the concerns they have about innovation implementation. Irrespective of whether users' concerns are caused by the environment or users' personal characteristics, these concerns appear in stages. According to Hall, Wallace, & Dossett (1973), concerns that users or intended users have about an

innovation or reform appear in patterns. The patterns of users' concerns are identified in stages and intensity according to the "Stages of Concern Theory". This theory considers the persons using an educational innovation in terms of their concerns about the innovation.

The Stages of Concern Theory (SoC) describes "the feelings, perspectives, and attitudes of individuals as they consider, approach, and implement use of an innovation" (Hall, 1979, p. 204). It is based on the hypothesis that individuals placed in a new situation requiring interaction with others are initially guided by personal concern and the demands that new situations make upon them. As personal concern becomes resolved, individuals shift to concern about the nature of the task and concern about quality of task performance. Ultimately, as concern about each stage becomes satisfied, concern shifts to the next higher stage until concern about impact the innovation has on others is reached.

Stages of Concern about an innovation move developmentally and progressively from self-oriented concerns, to task-oriented concerns, and ultimately to impact-oriented concerns. According to Hall (1979, p. 204), for a non-user or beginning user of an innovation, concerns about what the innovation is and what it means for users (stages 1, 2, and 3) are intense. As implementation takes place, management (stage 4) concerns increase, while informational and personal concerns begin to decrease. As experience in the use of the innovation increases, gradual increase in intensity of impact (stages 4, 5, and 6) concerns is gained. The seven stages of concern that progress from awareness, through informational, personal, management, consequences, collaboration, to refocusing are identifiable in educational innovations (See Figure 1) (Hall, Wallace, & Dossett, 1973, p.

36; Rogers & Mahler, 1994, p. 16). The SoC Theory is based on the assumption that it is difficult to manipulate a person's concern and expect an innovation to be implemented efficiently and effectively (Hall, 1979; Rogers, 1992).

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- 0 **Awareness:** little or no concern about or involvement with the innovation is indicated.
 1. **Informational:** A general awareness of the innovation and interest in learning more about the innovation.
 2. **Personal:** Individual indicates uncertainty about the demands of the innovation and his/her role with the innovation.
 3. **Management:** Attention focuses on the processes and tasks of using the innovation and the best use of resources.
 4. **Consequences:** Attention focuses on the impact of the innovation on students in their immediate sphere of influence.
 5. **Collaboration:** The focus is on coordination and cooperation with others regarding the use of the innovation.
 6. **Re-focusing:** The focus is on exploration of more universal benefits from the innovation, including the possibilities of major changes.
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Figure 1. Stages of Concern about change and innovation.

Several of the studies discussed in chapter two have identified stages of concern profiles of teachers and others working in educational institutions (Rogers, 1992; Rogers & Mahler, 1994; Kimpston, 1987; Kimpston & Anderson, 1988; Long, 1994). Some of

these concerns are also related to what Oscarson (1977) called personal perceptions towards the actual adoption of an idea, concept, or practice (adoption proneness) of these teachers. Considered in relation to a school-wide educational reform, identification of teachers' stages of concern can assist in the selection of intervention approaches that facilitate reform implementation.

Identifying teachers whose characteristics condition them to be more prone to adopt educational innovations has the potential to provide useful information about educational reform and the innovation adoption process. Furthermore, identifying the concerns teachers have about an innovation can facilitate its use even more. Imposing innovation use without considering users' concerns can result in psychological stress among the innovation users (Sink, Morris, & Johnston, 1995, p. 10, Chapter 4). Such psychological stress compromises decision making ability, inhibits clear-self perception, and builds a resistant, closed attitude toward the reform or innovation process. Stressful conditions caused by the concerns teachers may have about a reform must be dealt with before the process can proceed efficiently and effectively.

This study focused directly on validating the Stages of Concern Theory, using a school-wide education reform. The Stages of Concern Theory proposes that concerns of innovation or reform users appear in overlapping categories. These categories of concerns appear in logical progression as users gain experience and skill in using the reform and innovation (Hall, George & Rutherford, 1977, p. 13). Concerns of users, in effect, vary according to their knowledge and experience with the reform. It is appropriate to validate

the SoC theory, using a school-wide educational reform and innovation that has exposed users to varying duration and levels of experience.

School-wide educational reform is characterized by certain factors which appear to distinguish it from other educational reforms, according to Murphy (1992) . A school-wide reform is designed to:

1. involve all school personnel in the reform process,
2. focus on both the reform process, and reform outcomes,
3. involve educators within the entire school in professional development activities that focus on achieving the reform outcomes, and
4. include all educators in designing and implementing active strategies to achieve the reform outcomes.

School-wide reform is analogous to what Murphy (1992) referred to as wave two reform. As contrasted with earlier wave one reforms that emphasized keeping school restructuring to a minimum and seeking a quick fix, Murphy indicated that wave two reform employs change "to capitalize on the energy and creativity of individuals at the school level" (p. 6). Wave two reform recognizes that significant education reform demands the involvement of all key players: teachers, principals, superintendents, state officials, parents, students, and others.

Educational Reform and Innovation

In some respects, education reform and innovation became necessary because of political and industrial leaders' concerns that school graduates lacked mathematics,

science, and communications competencies needed in the workplace (National Commission on Excellence, 1983). This concern is a consequence of continuous technological development and the resulting upward-shift in job skills requirements (Bailey, 1990). As the proportion of high skill jobs grow and low skill jobs decline, skill requirements shift up even when there are no changes in the job content (Bailey, 1990, p.7). Those "students isolated from the real world in low-level academic courses and narrow-based vocational courses find it difficult to leap from high school to meaningful employment and additional education" (Bottoms, 1993, p. 4).

As a consequence of technological changes, additional and more complex skills and knowledge are required to perform successfully in the workplace. Future workers will, therefore, need skills and knowledge that should enable them to adapt to changing technology and associated job skills. Educational leaders have responded to these concerns by undertaking various educational reforms and innovations. These educational reforms and innovations, to some degree, evolved from a philosophical base.

Since the era of Dewey's social equality, and Snedden and Prosser's social efficiency (Wirth, 1972), education reform has been a focus of ideological debate. Both schools of thought saw the need for education reform but for different purposes. Dewey and his followers felt that education should facilitate realization of the country's democratic promises and warned against narrow utilitarianism in education, which promotes "pseudo-reforms of utilitarian trade training" (Wirth, 1972, p. 173). Education reform may eventually lead to economic benefits, but should not compromise individual liberty.

Snedden and Prosser, on the other hand, saw education as the means of meeting social efficiency and life adjustment needs. To them, training in trades and businesses was a legitimate obligation of public education. Differentiated programs should be created to match the capacities of children's different classifications. Separate education should then provide separate preparation to different children on the basis of these classifications.

Since this ideological dialogue took place between Dewey and Prosser and Snedden, leaders in politics, education, and industry have continued to respond to social efficiency and equality through various educational programs and opportunities. As the concerns these leaders had about knowledge, skills, and technological society change, education reform and innovation processes continue today. For instance, leaders responded to the industrial revolution by incorporating the practices and habits of industry into the educational system (Baker, Boser, & Householder, 1992). Furthermore, the Smith-Hughes Act (Wirth, 1972), the more recent Perkins II Legislation (American Vocational Association, 1990, p. 66), and the School-to-Work Transition Act (Hoerner & Wehrley, 1994) were efforts by educators and political leaders to respond to workplace skill requirements. The Southern Regional Education Board (SREB) has been responding to these skill and knowledge needs through various reform activities (Bottoms, 1993).

In 1987, the SREB created a region-wide schools reform titled "High Schools That Work" (HSTW) (Bottoms, 1995). The reform was established in response to the skills and knowledge needed by students to prepare them for participation in the nation's high technology workplace. The reform also aims at improving students' capacity for continuous learning as technology changes. As a school-wide reform, HSTW focuses on

changing school structure from the departmentalized management of instruction to an integrated arrangement. The boundaries between subjects and programs are being eliminated and cooperation and collaboration among all teachers are increasingly being encouraged.

The HSTW reform currently being implemented in the Commonwealth of Virginia aims, in part, at creating integrated academic and vocational curriculum and eliminating the general education track (Jorgensen, 1995). Integration of vocational and academic subjects may be defined as "the organization of the best curricular and pedagogical practices of academic and vocational education into a single 'integrated' experience" (Bodilly, Ramsey, Stasz, & Eden, 1992, p.4). Teachers of science, mathematics, English and communications, social studies, and vocational subjects work together in developing and implementing the HSTW through integrated academic and vocational studies.

The High Schools That Work reform requires interaction and collaboration among teachers who teach in a variety of areas. Successful implementation of this reform also requires teachers to work together and to support the processes. To enhance implementation, interventions such as "staff development workshops, materials, and time to work together" are provided to teachers (Jorgensen, 1995, p.2). However, successful implementation of educational reform may depend on relating interventions to teachers' stages of concern about the reform (Hall, Wallace, & Dossett, 1973). Consequently, the stages of concern that teachers have about the integration of vocational and academic subjects are important factors in the implementation of the HSTW reform.

While the HSTW reform was established in 1987 by the Southern Regional Education Board (Bottoms, 1995), implementation in the Commonwealth of Virginia began at various periods since then. Some high schools began implementation in 1987, while others began using the reform in 1995. Several high schools joined the reform process between 1987 and 1995. As a result of joining the reform movement at different years, high school teachers using the HSTW reform have different levels of skills and experiences relating to the reform. Users' different experience levels facilitated verification of the Stages of Concern Theory (Hall, George & Rutherford, 1977). The HSTW reform is, therefore, appropriate for verifying the SoC Theory because it is a school-wide reform, and teachers using the reform have varying levels of experience.

Statement of the Problem

The Stages of Concern Theory (Hall, Wallace, & Dossett, 1973) describes the developmental progression of teachers' concerns as they gain experience in the use of an educational reform. This theory has been studied among teachers using teaming, instructional modules, and those implementing technology education (Hall, George & Rutherford, 1977; Hall & Rutherford, 1976). The concern profiles have also been studied among teachers using educational computing and multi-media technology in their classrooms (Maney, 1994; Wedman & Heller, 1984). However, the SoC theory had not been studied among teachers having varied experience in the use of a school-wide education (HSTW) reform in the Commonwealth of Virginia. In addition, whether teachers' stages of concern profiles varied according to some characteristics of teachers

using a school-wide education reform was not clear. Among all the teacher characteristics (variables) indicated in the literature, the present study included education level, teaching area, months of reform-related experience, hours of reform-related training, and adoption-proneness. These variables revealed consistent relationships to teachers' stages of concern.

When this theory was verified, the concern of teachers using a school-wide educational (HSTW) reform was better understood. Consequently, teachers' concern profiles as they use a school-wide educational reform could be altered because appropriate interventions can then be applied. Appropriate intervention can, ultimately, result in effective use of resources and in reducing some reform concern-related difficulties among teachers implementing school-wide education reforms.

One of these difficulties, according to Schmidt, Finch, Faulkner, Isom, Magee, and Fox, (1992, p.15), is the lack of communication among teachers of vocational and academic subjects in secondary institutions prior to the reform process. Lack of communication may result from the total separation between academic and vocational education in today's high schools (Rosenstock, 1991, p. 435). Yet, integration of vocational and academic studies is an important HSTW reform process. The problem is that educational reform may not be effective and efficient if teachers' concern profiles are not known. Countering the factors that can delay effective implementation of educational reform depends largely on addressing teachers' concerns about the reform (Hall, Wallace & Dossett, 1973).

The Purpose of the Study

The purpose of this study was to validate the Stages of Concern Theory according to Hall, Wallace, and Dossett (1973). This required the study of the change in teachers' stages of concern as a function of their experience levels in using a school-wide education reform. The concern profiles of teachers grouped according to teaching areas, education level, reform related training, and adoption proneness as they implement a school-wide reform or innovation were also studied.

Research Questions

Several questions were generated to guide the study:

1. Do stages of concern according to Hall, Wallace, and Dossett (1973) vary among teachers as a function of levels of experience in the use of a school-wide education (HSTW) reform?
2. Do the concern profiles of teachers change when teachers are grouped according to teaching area, education level, hours of HSTW quality workshops attended, and adoption proneness as they implemented the HSTW reform?

Assumption.

The fundamental assumption in the study was that HSTW reform training provided to teachers using the reform was of uniform quality.

Delimitations.

This research only studied the stages of concern of users, using the self-response SoCQ. The ethnographic study method (observing and interviewing users) employed in the SoCQ development was not used. Therefore, results and interpretation were treated as hypotheses to be confirmed by the respondents. This study, therefore, focused on users' self-reported concerns about their involvement in the HSTW reform based on selected characteristics. Data were not subjected to correlational or factor analyses. The study result would be generalizable only to teachers in high schools where the HSTW reform was being implemented and who participated in the study.

Definition of Terms

To facilitate understanding of the terms used in this study, the following are definitions of terms as used in this research:

Innovation. Any process or product that is new to the user (Hall, 1979). Innovation "can range from teaching/ learning strategies, to scheduling arrangements and individualized instructional system" (Finch & McGough, 1991, p. 181), and to the integration of academic and vocational subjects. Innovation is the creative process of changing products and processes in response to strengths, weaknesses, threats, opportunities, challenges, and prevailing competition (Sink and Tuttle, 1989).

Concern. Represents descriptions of the various motivations perceptions, attitudes, and feelings experienced by persons in relation to an educational innovation (Hall, 1979).

Concern Intensity. Refers to depth of concern on each stage represented by teachers' score on the concern questionnaire, and having a possible maximum intensity of 35 and a minimum of 0 on the y axis of the concern continuum.

Concern peak. The highest concern intensity represented at a point for each teacher group.

Stages of Concern. Levels of "concern" expressed by persons in relation to an educational innovation. These levels include 0-awareness, 1-informational, 2-personal, 3-management, 4-consequences, 5-collaboration, and 6-refocusing (Rogers and Mahler, 1994).

Intervention. An action taken or event applied to facilitate the use of an innovation (Bennis, 1993, p. 134).

Change. The view of the SoC theory is that change is a process of altering the state of condition or product, and not a one time event. Change is a developmental process in the use of an innovation (Hall, Wallace, & Dossett, 1973).

Reform. The act of retaining most or all characteristics of an existing state while changing the positions or functions of the characteristics with the aim of achieving better results through improved processes (Andrew & Grubb, 1995).

Implementation. According to Dennison and Echternacht (1993), implementation is all of the events, actions, and decisions involved in putting a reform, innovation, or change to use. Implementers are responsible for applying the intervention.

Subject. A composite unit of knowledge organized for purposes of teaching and learning within an educational institution. Some examples of subjects include mathematics, English, the sciences, electrical-electronics, and social studies.

Summary

Teachers' perceptions and concerns about educational reform are influenced by the school environment and their personal characteristics. According to the Stages of Concern Theory (Hall, George & Rutherford, 1977), concerns appear in categories and intensity. Such concerns can be reduced by studying the concern profiles of teachers using an education reform and by applying appropriate intervention. The profiles of teachers were studied according to different teacher characteristics.

It was appropriate to use the HSTW reform in verifying SoC theory because teachers using the reform cover a wide range of experience levels. The reform is school-wide, and has been in use between 1987 and 1995 in the Commonwealth of Virginia. The SoC theory is based on the developmental conceptualization of reform adoption process, according to users' skill and experience with the reform. Verifying the theory, using teachers' experience levels facilitated understanding of teachers' concern profiles. Several studies related to teachers' stages of concern about educational reform, and professional and personal characteristics associated with the concerns will be discussed in chapter two.

Chapter Two

Literature Review

Introduction

Many professional opinions and studies address the implementation of educational reforms and types of reforms. Studies have been conducted showing stages of concern profiles of teachers implementing educational reforms. A synthesis of these studies and opinions is presented in this chapter.

The Educational Resource Information Center (ERIC), VTLS, and Dissertation Abstracts International data-bases were searched to identify literature relating to educational reforms and teachers' stages of concern about educational reforms. Dissertations, journal articles, studies published by various statutory research bodies, and textbooks were located and reviewed.

In this literature review presentation, the conceptual frameworks of the Stages of Concern Theory are synthesized with a view to identifying variables that relate to this study. Research reports and professional discussions about education innovations and reforms are synthesized. The SREB High Schools That Work (HSTW) reform being implemented in secondary institutions in the Commonwealth of Virginia is also described.

Conceptual Framework

Organization members often develop concerns about the use of reforms and innovations. These concerns are seen as appearing in stages and being of differential intensity as the reform and innovation use continues. The influence of organizational environment on reform and innovation users' concerns will be overviewed. How the concerns of reform and innovation users grow out of the influence of organizational environments is outlined. Then, the Stages of Concern (SoC) Theory by Hall, Wallace and Dossett (1973) is reviewed. Finally, the seven stages within the SoC theory is discussed.

Innovations and reforms take place within dynamic systems of an organization (Lewis & Seibold, 1993). New technologies first alter tasks and skills, and these changes, in turn, create opportunities and pressures for modifying the organization structure (Barley, 1990). Structures are the rules and resources that organization members use to create and sustain the systems. The structures are produced and reproduced through members' use of rules and resources. Structures exist within the organizational systems maintained by members' interaction processes. Thus, "It is the users' involvement- their interaction and emergent understandings and symbolic representations - that serve as the crucible within which innovation takes place (Lewis & Seibold, 1993, p. 326).

Innovation related information sources may widen or change as users participate in innovation activities. Participation will also initially modify tasks, skills, and other roles. Learning new methods of work, or using new models and concepts, are likely to

be resisted if they are perceived to be threatening to the established models and concepts (Glaser, Abelson, & Garrison, 1983). Furthermore, variation in users' characteristics (education, experience, age, expertise) can influence variation in users' innovation perception. Users' perception will ultimately be related to their involvement in implementation (Lewis & Seibold, 1993; Glasser, Abelson, & Garrison, 1983).

Users of reforms and innovations are considered part of the whole organization system. As reform and innovation are considered, these users develop some concerns. These concerns are influenced by personal and organizational characteristics, hence innovation users' concerns vary. The concerns are identified as appearing in stages and intensity among reform users according to the Stages of Concern Theory (Hall, Wallace, & Dossett, 1973).

Stages of Concern Theory

The SoC theory is based on the developmental conceptualization of adoption process within an educational institution (Hall, Wallace, & Dossett, 1973). The theory states that:

"When an individual encounters a new situation that requires interaction with others, his behavior is initially governed by concerns about himself and the demands that the situation makes on him. As these self-concerns become resolved, the individual moves to concerns about the nature of the task and on the task performance. Ultimately, the individual becomes concerned about the impact he is making upon others and strives to optimize his efforts for others" (Hall, Wallace, & Dossett, 1973, p.6).

The theory presupposes that users of an innovation are egocentric at first. Users ask more questions about what the innovation entails and how it will affect them. When information about the above questions is obtained, then further questions are asked about tasks related to the innovation. After the personal and task concerns are resolved, users then become concerned about the innovation's impact on students and other teachers. As innovation implementers gain information and become more trained and educated about an innovation, their concerns move higher on the concern continuum. On the basis of the above theory, effective implementation of innovations is facilitated by identifying the seven stages of concern (awareness, informational, personal, management, consequences, collaboration, and refocusing) and applying appropriate intervention (Hall, 1979).

Awareness Concerns (Stage-0).

The awareness concerns indicate lack of knowledge, information, and implications of the innovation for the non-user or beginning user (Hall, 1979). However, intense awareness concerns may indicate that the user is so knowledgeable about the innovation that much of his or her time and effort are on other more important activities. The interpretation of this stage of concerns rests more on knowledge of the innovation users' personal and professional characteristics. Only then would the change agent be able to make decisions on correct intervention.

Information Concerns (Stage-1).

At the information stage of concern, the innovation user is aware of the innovation and has become interested in learning more about it. An intense information stage of concern is not necessarily an indication of interest in the innovation or readiness to implement it. It is an indication of readiness to learn more about the innovation and the most appropriate indication of the training type and need. According to Hall (1979) and Hall and Rutherford (1976) presenting general information about the innovation, explaining the similarities with current practices, and outlining expectations in using the innovation are appropriate intervention to facilitate implementation. Furthermore, providing opportunities for enthusiastic users of the innovation to interact with teachers having intense information concern will facilitate implementation. These adoption-prone teachers can help those having intense information concern in the implementation process.

Personal Concerns (Stage-2).

Persons who show an intense stage 2 concern regard the innovation as a threat to them. A high concern at this stage may have resulted from school environment or personal characteristics (Hall, 1979). It may also be an indication of self doubts in relation to the innovation. Concern at this stage is characterized by potential conflicts an innovation may have with the existing organizational structure. It stems from what Marsh and Jordan-Marsh (1986) called absence of "awareness of the risks involved" in the innovation (p. 43). This stage is very sensitive and requires caution and tact on the part of the change agent while working with the users having this concern.

Handling personal concerns requires initially providing personal support and not pushing implementation. It requires clarification of the innovation's relationship to current practice and stressing personal relevance the innovation may have. There is the need to "legitimize the expression of personal concerns" to increase support and implementation of the reform as interventions are applied to resolve such personal concerns (p.206).

Management Concerns (Stage-3).

Teachers having stage 3 concerns have begun to use the innovation and are having problems with management. The high management concerns result from concerns about resource application, time of use, and sometimes techniques of use. The user may not be experienced enough to use the innovation and may not appropriately coordinate activities for effective implementation.

Hall (1979) suggested some interventions to address management concerns that teachers may have. The concerns should be acknowledged and answers to specific questions provided. Ways of coordinating reform functions with other teaching functions should be explained in order to prevent the reform from being seen as an added responsibility. A model for effective implementation, and information about successful and unsuccessful implementation should be shared with teachers. In order to enhance information sharing during implementation, the enthusiastic implementers should be identified and paired with those who are not as enthusiastic.

Consequence Concerns (Stage-4).

Teachers at the stage 4 concern level are thinking of the innovation's impact on students and how the innovation can be used for additional student impact (Hall, 1979). They are concerned about how to effectively change the innovation for the benefit of the students. Teachers who have this stage of concern are usually identified as adoption-prone, and are readily prepared to work with the change agent to implement the innovation. Little assistance from the change agent, in terms of written information about interesting topics relating to the reform, sending teachers to workshops, and acknowledging the teachers' potentials will facilitate implementation.

Collaboration Concerns (Stage-5).

Reform agents' attention to the collaboration concerns that teachers may have about innovation use is important, especially when the concept of collaboration is accepted (Hall, 1979). This stage is crucial to the whole concept of integration of academic and vocational subjects in schools. Teachers involved in integration process require cooperation and collaboration, and some may have intense concern at this stage. Concerns at this stage relate to frustrations expressed by teachers for not knowing what other teachers involved in the innovation are doing in their subjects, especially those with whom they are required to collaborate. The concerns may be diffused by having concerned teachers meet to exchange ideas on how best to work together. Furthermore, advocacy and promotion of collaboration-concerns should be encouraged among administrators and department heads, in addition to all teachers who express this concern.

Refocusing Concerns (Stage-6).

Teachers and education professionals with stage 6 concerns are knowledgeable about the innovation, but have their own opinion about the direction they think the innovation should be going. They may also have other approaches they think might have more impact on the innovation than the approach adopted by the change agent. If persons having this concerns are in positions of authority, then implementation may be difficult as they tend to oppose the normal processes. Teachers having stage 6 concerns can be helped to direct their energy in more productive areas. They may be encouraged to "take action" to address their concerns.

Application of the Stages of Concern Theory

Hall, Wallace, and Dossett (1973) began development of the Stages of Concern theory, using the Concern Based Adoption Model (CBAM) to assist education professionals in the change process. The CBAM emphasizes "trial use of an innovation, its installation, and ultimate integration into normal operative structure of an institution" (p.4). It is based on Fuller's (1969) findings of "developmental sequence in which prospective and in-service teachers' concerns appear in dependable patterns on a continuum" (p.5). The pattern indicates self concern first, then task concern, and finally, concern about the students. Fuller (1969) considered these concerns as potential needs which provide both the diagnosis of change inhibitors, and the indication of intervention to facilitate change.

The work by Hall, Wallace and Dossett (1973) resulted in the development of the Stages of Concern Questionnaire (SoCQ). It was found that identifiable SoC exist among teachers and professors when the data were subjected to factor analysis (Hall & Rutherford, 1976). The factors corresponded with the previously defined stages, with correlation coefficients ranging from .67 to .96" (p.230). Hall and Rutherford studied teachers implementing teaming and professors implementing instructional modules and concluded that the seven stages as defined in the SoC Theory exist for teachers implementing teaming and for professors implementing the instructional modules. Furthermore, each stage correlated more with adjacent stages than with more distant ones, indicating that the innovation adoption process is developmental.

Rogers and Mahler (1994) used the SoCQ to ascertain level of acceptance of technology education in the field. The majority of teachers studied (76%) had intense concern in the first 3-stages (awareness, informational, and personal), indicating their non-acceptance of technology education. Only 23% had peak concern at the last four stages (management, consequences, collaboration, and refocusing), indicating acceptance.

The SoC theory is relatively new (Hall, Wallace, & Dossett, 1973), but it has been applied extensively in the study of teachers concern profiles as they use education reforms and innovation. Apart from the conceptual base of the theory, several studies of teachers concern profiles as they implement educational reform revealed different concern intensity for different teacher characteristics. These characteristics include teachers' age and education, and teachers' school, in terms of type and level. Other concern profiles depended on implementation experience, hours of reform-related training, and professional function.

Teachers' adoption-proneness (personal perceptions towards the actual adoption of an idea, concept, or practice) is also capable of influencing their concern and perception about reform and innovation use. The studies relating to these variables are reviewed next.

Age and Education.

In the Rogers & Mahler (1994) study, SoC was analyzed according to teacher characteristics. The data revealed that only 6.3% of the population over the age of 50 accepted technology education. Furthermore, teachers with more than 25 years of teaching experience indicated acceptance of technology education. Analysis of teachers' stages of concern according to educational levels showed that only 24.5% teachers with bachelor's degree and 22.2% of those with master's degree showed acceptance of technology education.

A study by Glaser, Abelson, and Garrison (1983) focusing on implementation of planned change revealed that teachers' age was a determinant of their readiness to adopt an innovation. Lewis and Seibold (1993) studied structured implementation activities within an organization they called "Kelco" and found that interaction, training, and education effect the implementation activities (p. 341). Variation in members' education will affect variation in their socialization process within the organization.

Type and Level of School.

According to Lewis and Seibold (1993), position is one of the determinants of members' readiness to use an innovation. Level of innovation use varies according to

members' level (which determines their relationship) within the organization. Furthermore, acceptance or concern about innovations vary according to the types of organization (Glaser, Abelson, and Garrison, 1983). According to Tornatzky and Klein (1982), perception attributes of organization members is influenced by characteristics of both the particular setting and all the members of the organization (p. 28). Research studies within educational organizations, as reviewed below, support Lewis and Seibold (1993), and Glaser, Abelson, and Garrison, (1983).

Hall and Rutherford (1976) administered the SoCQ to teachers implementing teaming, and professors implementing instructional modules. When the data were analyzed according to schools, it was found that teachers in school A had high concern in the first three stages, but had more intense concern in stage 1 (informational). The more intense stage 1 concern indicated the desire of school A teachers to learn more about teaming. School B, however, showed more intense stage 2 (personal) concern. The school B teachers' response tend to show that they are not ready for teaming, but preferred to maintain their present methods. Furthermore, many teachers in school B had transferred from another school where teaming had been implemented. Consequently, their peak concern was in stage 5 (collaboration), a concern which, according to Hall and Rutherford (1976), is important for implementation of the innovation. School C teachers had started teaming only two months before the study, according to Hall and Rutherford (1976), and are expected to have intense stage 1 (awareness) concern. School D teachers had experienced 5 years of teaming and were characterized as "veteran teamers" (p.232). Some of school D teachers were thinking of how to change the teaming process.

When data on teachers' stages of concern were analyzed according to types of school, acceptance of technology education was indicated by 38.9% of teachers in junior high school, 24.2% of teachers in senior high school, and 13.8% of teachers in grade 7-12 schools (Rogers & Mahler, 1994). In all the above cases, the data showed no significant difference between teacher characteristics when subjected to Chi-Square statistical procedures. When data from senior and junior high schools were compared, junior high school teachers revealed intense concern at stage 2 (personal), while senior high school teachers revealed intense stage 1 (informational) concern, again indicating non-acceptance of technology education (Rogers, 1992).

A study of teachers' concerns about microcomputers in their classroom indicated no difference when data were subjected to a "median test" (Cicchelli & Baecher, 1989, p. 43). However, some trends were observed in the results. Among the high school teachers, junior high school teachers, and elementary school teachers, differences in self concern were observed. High school teachers showed greater awareness concern than the junior high and elementary school teachers. Furthermore, elementary and junior high school teachers showed intense stage 3 (management) concern.

Wedman and Heller (1984) studied teachers' concerns about educational computing and found that teachers from different schools had equally intense concern at the awareness, informational and personal stages. The study revealed differential concerns at the collaboration stage, a result which the researchers attributed to more experience possessed by teachers in those schools with high collaboration concern. The overall result confirmed the CBAM theory of innovation adoption because teachers with no experience

in educational computing showed concerns at the first three stages. Those with experience showed higher peak concern at the collaboration stage. A comparison of two schools by Rogers (1992) showed that teachers from both schools have intense stage 1 (informational) concern. Only 25% of teachers in one school showed intense concern at management or collaboration stage, which, according to Rogers (1992), indicated acceptance of technology education.

Implementation Experience.

According to Wilton and Pessemier (1981), an individual cannot be expected to answer every question relating to a new technology or new knowledge. However, as learning relating to the technology takes place, discriminant attributes and objects are associated with the "evoked set", the new technology, thereby increasing the individual's "perceptive map" (p. 163). As knowledge of the technology grows, discrimination is expected to improve. Studies that reveal that variations in education, training, and experience affect variations in perceptions of innovations are presented below.

Analysis of data according to teachers' years of experience with teaming showed that the more years of experience teachers had implementing teaming, the less intense their concern about teaming (Hall and Rutherford (1976). Teachers with no teaming experience had higher SoC at the stages 1, 2, and 3 (awareness, informational, and personal). Because of the intensity variation in the concerns of teachers implementing teaming, Hall and Rutherford (1976) concluded that "training input about the innovation will not be relevant until after two to three cycles of use" (p. 233). Only then can

intervention be relevant to the most intense concerns. Periodic examination of concern about an innovation is appropriate because as implementation progresses, users' concerns change (James & Hall, 1981).

Fennel (1992) conducted a study that investigated relationships between teachers' perceptions of the organizational-cultural linkages in the schools and their stages of concern about implementing provincially mandated instructional changes into their classroom teaching strategies. The result showed that teachers in schools where high degree of communications exist among teachers, where principal exert less influence on the instructions, where teacher-principal communication about instruction is less, and where there is less staff conflict, have more positive response toward the implementation process in their schools. Such teachers also have lower refocusing concern. Collaboration and discretion are both positive and necessary factors to the success of implementation process.

A study of teachers' stages of concern about implementing benchmark testing revealed that after two years of implementing benchmark testing, only 8% of the teachers were at the 0, 1, and 2 (awareness, informational, and personal) levels of concern, and 32.3% were at stage 4 (consequences) concern (Kimpston & Anderson, 1988). Similarly, principals were no longer at the awareness stage, but had peak concern at the consequences and collaboration levels (p. 328). Such changes in intensity of concern resulted from experience in the use of the innovations. Changes in SoC intensity can thus be improved through training.

Teaching Experience.

Maney (1994) conducted a study which sought to determine whether multimedia technology was adopted by teachers in selected public high schools. Variation existing between adopters and nonadopters of media technology related to years of teaching experience. Furthermore, it was found that schools that adopted media technology tended to have adopting principals than schools that did not. A study to determine the stages of concern about technology education among teachers in North Carolina revealed that the majority of the teachers in the state had positive feelings about technology education (Linnell, 1991). However, the author concluded that teachers who considered themselves to be "experienced or intermediate users of technology education" should work with novice and nonuser teachers.

Hours of Training.

Scharmann and McLellan (1992) used the SoCQ to determine the differential effect of a one-week intensive workshop on acceptance of a new concept called science, technology, and society (STS). The subjects consisted of experienced science teachers trained more than 5 years earlier and science education graduate students trained in the 1990's. The results showed a shift from the first 3-stages (consequences, collaboration, and refocussing) of concerns after the workshop about STS. The conclusion points to the impact of in-service workshop on acceptance of educational innovation. The authors stressed that further training about the new concept would facilitate implementation even more than taking regular graduate courses.

A study by Broyles and Tillman (1985) investigated the intensity of teachers' concerns about an innovation before and after innovation-related training was taken. The SoC result was an outcome measure resulting from training in this instance. The result showed that the intensity of stages 0, 1, and 2 (awareness, informational, and personal) concerns were greatly reduced after the training session. Moderate intensity of concern existed for stage 3 (management) concern. Only slight intensity of concern existed for stages 4 and 5 (consequences and collaboration) concerns. The result reflected the content of the training session which concentrated on making the trainees aware of the innovation, providing information about the innovation to them, and showing what personal benefits are there for them. The result also reflected the fact that the intensity of stages 3, 4, 5, and 6 (management, consequences, collaboration, and re-focusing) concerns become more obvious after workshop participants had some experience innovation use.

Knowles (1981) designed a pre-post test for teachers participating in an in-service program to train them to individualize physical education according to specified regulations. Before the training, teachers had intense concerns at stages 0-awareness, 1-informational, and 2-personal levels. After seven weeks of training, the post-test showed intense concern at stages 3-management, 4-consequences, and 5-collaboration. The results supported the theory of the CBAM approach to educational innovation adoption.

SoC According to Professional Function.

Studies by Kimpston (1987) and Kimpston & Anderson (1988) focused on the stages of concern of teachers and principals about benchmark testing according to their degree of involvement, their knowledge of benchmark testing, and the nature of staff development activities they participated in . A high percentage of teachers and principals reported similar stages of concern. For instance, 89.6% of the teachers and 88.5% of the principals initially indicated peak concern at the 0, 1, 2, (awareness, informational, and personal) levels.

Dennison and Echternacht (1993) found significant differences in the stages of concern about technical preparation (tech prep) between vocational and academic educators, administrators, and guidance counselors. The academic and vocational educators had more concern at the personal stage than the administrators and guidance counselors. Also vocational educators had more concern for tech prep management demands than administrators and counselors, while administrators were more concerned about collaboration efforts. When data between secondary and postsecondary vocational and academic teachers were subjected to ANOVA procedures, significant differences were revealed in four (personal, consequences, collaboration, and refocusing) of the seven stages of concern. Secondary vocational and academic teachers had peak concern at the personal, consequences, collaboration, and refocusing stages.

The SoC profiles of academic teachers, administrators, vocational teachers, and guidance counselors implementing tech prep were studied by Long (1994). The results showed differences in the stages of concerns about tech prep among these professionals.

Administrators showed highest peak concern at the collaboration stage and the next highest peak concern at the consequences stage. Academic teachers showed highest peak concern at the consequences stage and their next highest concern at collaboration stage. Vocational teachers had highest concern at the collaboration stage and second intense concern at the consequence stage. Counselors had their highest concern at the collaboration stage, followed by the second intense concern at the consequence stage. The study results indicated that practitioners have similar stages of concern about tech prep implementation (Long, 1994).

The stages of concern theory describes the feelings and "attitudes of individuals as they consider, approach, and implement use of an innovation" within an organization (Hall, 1979, p. 204). On the other hand, adoption-proneness is the "individual's perception toward the actual adoption of an idea, concept, or practice" (Oscarson, 1977, p. 30). Innovation users' attitudes as they consider, approach, and implement use of an innovation may be influenced by their perception toward the actual adoption of the innovation. Adoption-proneness is therefore one of the characteristics considered to relate to stages of concern of innovation users.

Adoption Proneness.

Studies identified personal characteristics of vocational teachers that can predict their adoption-proneness. These characteristics included age, number of journals read, amount of time spent in the school district, and satisfaction level in teaching (Oscarson,

1977). Such characteristics were identified as predictors of adoption-proneness among the teachers studied.

Oscarson (1977) found that older vocational teachers were more prone to adopt an innovation than younger vocational teachers. He, however, explained this positive disposition to adoption on the fact that most vocational teachers joined the teaching profession after being "exposed to various practices and techniques" in industries (p.37). Such exposure to various practices gave them some advantage over younger teachers. The study also revealed a relationship between the number of journals read monthly and adoption-proneness. The more active teachers became in seeking out new information, the more they tended to adopt an innovation. The study also revealed that those who were likely to adopt an innovation are more 'vocationally' mobile. Teachers with more years of experience within a school district were less adoption-prone than those who had fewer years of experience within the district. There was also a positive relationship between teacher satisfaction and adoption-prone. Vocational teachers who were more adoption-prone, also revealed a desire for more interaction with academic teachers. A similar study by Oscarson and Finch (1980) revealed that some teachers believed in stronger influence by academic teachers on a vocational teacher's classroom procedure. Furthermore, the younger vocational teachers who read more professional publications scored higher in the adoption-proneness inventory. Adoption-proneness and stages of concern seem to have some relationship which is not very clear.

Identifying the concerns teachers have about education reform and innovation can facilitate implementation. Mandating implementation without considering the concerns of

teachers result in psychological stresses among some teachers. Psychological stresses relate to the impact of concerns about teachers' unawareness, lack of information, or fear of the unknown about the reform (Sink, Morris, & Johnston, 1995). Such stresses must be dealt with to enable educational response to change to continue as the needs arise. "If the innovation is a positive one and there is support for its implementation, an individual's concern profile plotted over time should have the form of a progressive wave motion from left to right" as illustrated in Figure 2 (Hall, George & Rutherford, 1977, p.43).

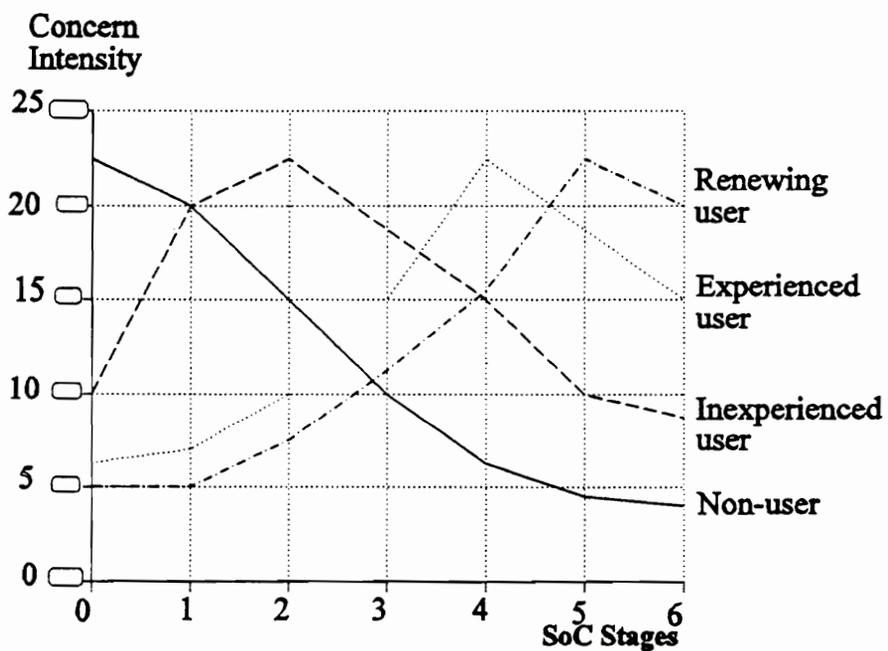


Figure 2. Development of Stages of Concern

Successful use of a reform process can be easier when teachers' concerns are considered before applying interventions. Teachers' concerns are important because they make primary contact with students in classrooms. In the Southern Regional Education Board (SREB) Site Development Guide (SDG) #4 (1994), less emphasis is placed on teachers' personal and professional concerns. Yet, Robert's (1994) study revealed that factors impeding integration of vocational and academic subjects in the tech prep process hinge on teachers. Some teachers feel vulnerable to change and feel that the security of their teaching subject is threatened. The unwillingness to work with other teachers from different departments or other educational levels is another factor that impede integration, according to Roberts (1994). Other factors include teachers' unawareness of what tech prep is, regarding planning for tech prep as an additional task to normal duties, and improperly trained new teachers (Bragg, Layton, & Hammons, 1994).

Policies mandate teachers with varying backgrounds and concerns to work together during implementation of educational reform. Levels of success, therefore, are likely to be dictated by the stages of teachers' concern about such reform. Identifying such concerns can facilitate implementation of the reform.

In spite of the many variables that are related to teachers' concern about reform implementation, education innovations and reforms continue. Continuation of education reforms is meant to ensure continued development of human resources for the nation's economy. Consequently, leaders continue responding to these needs by providing for the various educational reforms. Such educational reforms are guided by ideologies characterized by the prevailing social and economic conditions. The next section discusses

educational responses to change in respect of the origin of the thought to reform education. An overview of recent reforms such as technology education, tech prep, and school to work will be made. The High Schools That Work (HSTW) reform, which will be used for this study, is also be reviewed.

Education Responses to Change

Education reform continues to concern education leaders. Some leaders consider Dewey's social equality through education. Others consider maintenance of Snedden and Prosser's social efficiency as the main function of education. Most contemporary Educators, however, consider economic efficiency and social equality in educational reforms (Wirth, 1972). Some of the reforms include technology education, Tech Prep, the School to Work System, and the High Schools That Work. Most of these reforms have characteristics which differentiate them from a school-wide education reform.

Technology education is one of the responses by educators to prepare students to live in the high technology world. Technology education provides students with the knowledge and application of technological resources, using systematic approach (Savage & Sterry, 1990). School subjects are organized in the context of the reality of technological world beyond the school (Oaks & Pedras, 1992). Technology education is emphasized on a course by course basis at the junior high school level and therefore may not be regarded as a school-wide reform.

Another response by political and educational leaders is Tech Prep which provides for integration of academic and vocational subjects (Hoerner, Clowes, & Impara, 1991).

The program provides for an articulation agreement within a consortium of secondary and postsecondary institutions and involves business and industries within the locality (Roberts, 1994). The major purpose is to enable students to complete college education. According to Clowes, Hoerner, Aneke, DeWitt, Wang, and Wehrley (1994), the most frequent development in Tech Prep programs is the use of applied techniques in the delivery of instruction, thereby developing students' opportunities to continue their education while preparing for work. Since Tech Prep implementation may not provide for the participation of all school personnel, in this respect it does not satisfy the characteristics of a school-wide reform according to Murphy (1992).

The most recent national response to change in skills and knowledge requirements is the School to Work (STW) system that emphasizes students' transition from school to work (Bailey, Koppel, & Waldinger, 1994). The STW system consists of three major components, a school-based component, a work-based component, and connecting activities (Hoerner & Wehrley, 1994). Participation in this reform may not be as open to all school personnel and all students as the High Schools That Work reform.

High Schools That Work Reform.

The Southern Regional Education Board (SREB) established the High Schools That Work (HSTW) as a region-wide educational reform (Bottoms, 1995). This reform satisfies Prosser and Snedden's social efficiency, as well as Dewey's social equality through opportunities provided to students for continuing education and for work preparation. The reform was established in response to the skills and knowledge needed by students to

prepare them for participation in the nation's high technology workplace and for effective competition in the global economy. The reform also aims at improving students' capacity for continuous learning as technology changes. Since its establishment in 1987, the HSTW reform has grown from 28 sites in 13 states to over 100 sites in 19 states (Bottoms, 1994).

Elaborate guides on establishing implementation sites throughout the Region have been produced. These guides include SREB SDG #1 (1994) which outlines how the vision, mission, goals and strategies should be established. Emphasis is placed on establishing teams and encouraging sustenance of team spirit (SREB SDG #2, 1994). Team memberships are drawn from academic and vocational teachers, postsecondary representatives, business and community representatives, and staff development specialists. A central team is assisted "by four teams dealing with issues related to curriculum, staff development, guidance and public information, and evaluation" (p. 3). The structure is obviously capable of influencing perceptions of some teachers.

Establishing an implementation site, and continuing an existing site are guided by the assessed academic and career needs of students (SREB SDG #3, 1994). Staff development is an integral component of the implementation strategy (SREB SDG #4, 1994). The guide describes implementation sites with what Senge (1990) calls "learning organization". As learning organizations, the HSTW sites continue to harness the comprehensive talents of human resources within the sites, collect data on a continuous basis, and make such data available for continuous improvement of the reform. Documents on staff development stress the focus on student performance improvement as

a core aim of staff development efforts. Although teachers are key players, the concern they have about each phase of implementation is not explicitly expressed.

A **High Schools That Work** reform being implemented in the Commonwealth of Virginia is meant to create an integrated academic and vocational curriculum, and eliminate the general education track (Jorgensen, 1995). Thirty one HSTW sites are implementing the program throughout the Commonwealth. Science, mathematics, English, Social Studies, and vocational subject teachers are expected to work together to develop an integrated "academic and vocational curriculum". The curriculum is designed to enable students to learn through doing. Success in the implementation is enhanced by providing teachers with interventions such as "staff development, materials, and time to work together" (p.2). These interventions correspond with some elements of success with integration as outlined by Grubb (1991). Vision and commitment by individuals involved, administrative support, availability of time, training opportunities, reasonable autonomy for implementers, and a sustained effort are all elements of successful integration (p. 25). Proper connection between these interventions and teachers' concerns also facilitate implementation.

Summary

The perceptions of reform users are functions of an organization's environment (Emery & Trist, 1965; Lewis & Seibold, 1993). These perceptions often result in concerns about reform use. Concerns appear in stages and differential intensity (Hall, Wallace and Dossett, 1973). The Stages of Concern Theory is based on the

developmental concept of reform adoption process within an educational institution. Hall, Wallace, and Dosett (1973) developed SoC Theory using the concern-based adoption model (CBAM). According to the Theory, teachers express self-concerns first, then task concerns, and finally, concerns about students and other teachers. The SoC identified include awareness, informational, personal, management, consequences, collaboration, and refocusing. Stages may be assessed using the SoC Questionnaire, which has been included in several studies of teacher involvement with various educational reforms.

The SoCQ has been employed to study the concern profile of teachers implementing teaming and professors implementing instructional modules (Hall & Rutherford, 1976). The level of acceptance of technology education has also been studied (Linnell, 1991; Rogers, 1992; Rogers & Mahler, 1994). Furthermore, the SoCQ was used to study teachers' concerns about microcomputers in their classrooms (Cicchelli & Baecher, 1989), educational computing (Wedman & Heller, 1984), and organizational-cultural linkages in schools and mandated reform (Fennel 1992). The theory was applied to study teachers' concerns about bench-mark testing (Kimpston, 1987; Kimpston & Anderson, 1988), multimedia technology (Maney, 1994) and acceptance of science, technology, and society concept (Scharmann & McLellan, 1992). Teachers' concerns about inservice training programs has been studied using the pre-post test design (Broyles & Tillman, 1985; Knowles, 1981). Furthermore, teachers' concerns about Tech Prep has been studied (Dennison & Echternacht, 1993; Long, 1994).

Variables used in the above studies include educational levels and different schools (Rogers and Mahler, 1994; Cicchelli & Baecher, 1989; Heller, 1984; Rogers, 1992), years

of experience with the reform (Hall & Rutherford, 1976; Kimpston, 1987; Kimpston & Anderson, 1988; Linnell, 1991) and training (Scharmann & Mclellan, 1992; Broyles & Tillman, 1985; Knowles, 1981). These variables were all found to relate to reform users' stages of concern. Teachers' professional functions (Kimpston, 1987; Kimpston & Anderson; Rogers & Mahler, 1994), age, training (Glaser, Abelson, and Garrison, 1983), and teaching experience (Maney, 1994; Linnell, 1991) also related to teachers' concerns about reform use. It was found that adoption-proneness, age (Oscarson, 1977), ideal and actual influence exerted by peers (Dohman, 1970), and number of journals read monthly (Oscarson and Finch, 1980) are related to innovation adoption-proneness. However, teaching area, reform-related experience, education level, and reform-related training have shown consistent relationships with stages of concern. These variables will, therefore, be used in this research along with adoption-proneness which has shown a relationship to teachers' perception of the reform.

Chapter Three

Methodology

Introduction

Stages of Concern Theory according to Hall, Wallace, and Dossett (19973) were studied in a school-wide (High Schools That Work-HSTW) educational reform context. Teachers' personal and professional characteristics were examined. Some of these characteristics that relate to stages of concern were synthesized in chapter two. In this chapter, the research methodology that was used is described. The study design as well as the population and sample used are described. Furthermore, SoC Questionnaire and data collection procedures are explained and data analysis techniques are described.

Research Design

The ex post facto research design was used in this study. This design was most appropriate because the researcher could not control the independent variables, and only used them in their pre-existing attribute conditions (Ary, Jacobs, & Razavieh, 1990). Some of these variables, such as adoption proneness, education level, teaching area, HSTW reform experience, and hours of HSTW workshops attended that have potential to influence the dependent variables were included in the analysis. Including such variables facilitated more accurate interpretation of results.

Participants

The participants of this study consisted of teachers engaged in HSTW reform at the thirty sites in the Commonwealth of Virginia where HSTW reform was being implemented. Generalization of the study results was limited to teachers engaged in HSTW reform at high schools where the reform was being implemented at the time of the study and who participated in the study. Since a multivariate analysis of variance (MANOVA) was employed, it was expected that with seven dependent and four independent variables the number of participants should be at least 172 (4×43) (Stevens, 1992, p. 229). According to Stevens (1992), each group within a MANOVA procedure (highest teacher grouping used in MANOVA analysis was 4) should have a minimum of 43 participants for an alpha of .05. This minimum number was necessary to achieve a power of .7 or more. The more the participants per independent variable, the greater the power.

Fax-letters, mail-letters, and phone-calls were used to contact the HSTW Local Pilot Site Coordinators in the 30 sites engaged in the reform in Virginia. Successful contacts were established between the researcher and the coordinators in 23 sites, representing 76.7% of the sites. Of these 23 sites, nineteen expressed willingness to participate in the study, representing 82.6% of the twenty three successful site-contacts made. Of the four sites reached that would not participate, one declined because of "school division evaluation of the block schedule". Three others required the researcher to appear in person for interviews with various school system officials. The invitation to meet with school officials was declined because it would have resulted to violation of a condition for

approval by the Virginia Tech Human Subjects Review Board. The approval required that anonymity be maintained between the researcher and members of each site. The invitation was also declined to prevent any bias that may result from the researcher knowing some of the participants in person. Efforts through several phone-calls, fax-messages, and mail-letters continued until the date set for accepting responses was reached. The efforts failed to connect the researcher with HSTW Site Coordinators at seven of the sites.

Participants consisted of teachers in nineteen sites engaged in the HSTW reform in Virginia. One thousand two hundred and seven teachers were asked to participate in the study. Of the 1207 questionnaires forwarded to site coordinators and distributed to teachers, 677 teachers' questionnaires were returned, representing 56.09% return rate. The 56.09% figure resulted by applying the response-rate formula according to Dillman (1978, p. 50). Thus:

$$\text{Response rate} = \frac{\text{number returned}}{\text{number in sample} - (\text{noneligible} + \text{nonreachable})} \times 100$$

According to Babbie (1983), return rates for survey research vary. However, a return rate of 50% is considered to be good, while a rate of 70% is considered very good (p. 226). For this study, a return rate of 55% was set. Out of the 677 questionnaires returned, 22 were not usable because participants did not complete some sections. Furthermore, questionnaires completed by eight counselors were excluded from data analysis, since these people were not classified as teachers. In addition, 9 questionnaires

were not included in data analysis because they were returned after the return period expired. A total of 638 usable questionnaires were, therefore, used in data analysis.

An ex-post-factor examination of the seven sites that could not be reached revealed that there was no clear pattern among them. There was geographical spread, within Virginia, among the non-reachable. There were also geographical representations of each region in Virginia among the sites that participated.

Instrumentation

An instrument that contained measures for Stages of Concern (SoC) (Hall, George, & Rutherford, 1977) and Adoption-proneness (AI) and a section for demographic information was used to collect data (Appendix B). The instrument consisted of a concern-related information section that includes 35 items (statements 1-35), with 5 items covering each of the seven stages of concern constructs (Hall, George, & Rutherford, 1977). A Likert type scale ranging from 0 (irrelevant) to 6 (very true of me) was provided for each item statement. The adoption-proneness measure provided information about individual teachers' ideas, concepts and practices as they relate to innovation (statements 36-52)(Oscarson, 1977). A Likert type scale ranging from 1 (No never) to 7 (Yes always) was provided at the end of each statement. The demographic section of the instrument contained information relating to teachers' reform-related characteristics.

Validity and reliability.

As detailed in chapter two, the SoCQ and AI were used in several studies, and their validity and reliability with equivalent groups have been documented. The internal consistency coefficient of reliability for the seven SoCQ constructs was reported by Hall, George, and Rutherford (1977) to range from .64 to .83. This reliability figure was corroborated by Cunningham, Hillison, and Horne (1985) to range from .57 to .82. Test re-test reliability ranged from .65 to .86 (Hall, George, & Rutherford, 1977). The instrument was again subjected to a test for internal consistency (Bailey & Pasha, 1992). The resultant Cronbach's alpha ranged from .42 to .79. Bailey and Palsha suggested reduction of the constructs from seven to five, but warned that further studies of the 5 constructs would be necessary before fewer than seven constructs could be used. Consequently, the original SoCQ (Hall, George, & Rutherford, 1977) was used for the present study.

SoCQ construct validity, using 830 teachers and professors, was partially supported because "72% of the items correlated more highly with the stages to which they had been assigned than with any other stage" (Hall, George & Rutherford, 1977, p. 21). Furthermore, as distance between subscales increases, the data indicated decreasing correlations. In addition, factor analysis results supported the relative independence of the subscales. Items loading on a particular construct in the SoCQ were scored similarly on the scale. The similarity of scores on each item-scale infers that each scale measures ideas distinct from ideas measured by other item-scales. Finally, Bailey and Palsha (1992) found a high degree of correspondence between scale scores and interview data.

Using the Spearman-Brown Formula, AI reliability of .95 was computed. Concurrent validity for the AI was at least partially established through a correlation of .44 between 40 vocational teachers' ideas, practices, and products and their instrument scores (Oscarson, 1977). Positive correlation coefficients between items ranged from .31 to .81. The split-half method was employed to establish reliability of the instrument.

Selection of Variables.

Some variables in the reviewed literature (see chapter two) relate to SoC. A few of those variables that relate to SoC such as age, teaching experience, level of school, and type of school seem to have weak effects on teachers' concern profiles. Such variables were not included in the present study. Among all the variables indicated in the literature, the present study included education level, teaching area, months of reform-related experience, and hours of reform-related training. These variables showed consistent relationships to teachers' stages of concern.

Adoption-proneness was also added to study how teachers' stages of concern change as a result of their adoption-proneness. The rationale for adding adoption-proneness stems from its relationship to users' perceptions toward reform use, and also based on the influence of personal characteristics on the concern of organization members (Oscarson, 1977; Lewis & Seibold, 1993). It was therefore expected that those who were more adoption-prone, using the Median-Split method (Baumeister, 1990), would have peak concerns at stages 3, 4, 5, and 6, while those who were less adoption-prone would have peak concerns at stages 0, 1, and 2.

The independent variables in this research included teaching area, educational level, months of HSTW reform experience, hours of HSTW reform related training, and adoption proneness. The dependent variables consisted of stages of concern. The stages were computed using the responses from 35 items representing the seven stages. The seven stages included, awareness, informational, personal, management, consequences, collaboration, refocusing (Hall, 1979).

Data Collection and Analysis.

A composite instrument that contained the various sections (SoCQ, AI, and request for demographic data) were used to collect data for the study (See Appendix B). Instruments were sent to the school contact person (site coordinator) at each of the thirty sites involved in HSTW reform. Completed instruments were returned to the researcher directly in self-addressed, stamped envelopes. Each instrument was numerically coded to maintain anonymity, and to link contact persons with participants. Time needed for a person to complete the instrument took no more than 15 minutes. Completed instruments were expected to be returned within 3 weeks after they had been sent to contact persons. However, some schools returned their responses later because of several reasons.

A letter requesting for willingness to participate in the study and to act as contact person was forwarded by fax to each of the thirty HSTW site coordinators in the thirty sites in Virginia (Appendix A). Follow-up phone calls were made to ascertain the decisions of each site coordinator regarding willingness to participate in the study. After five days of communications with the various site coordinators, contact was established with twenty

three site coordinators out of which nineteen sites participated in the study. The instruments were then forwarded to teachers in the nineteen sites engaged in HSTW reform in Virginia, while trying to establish contacts with coordinators in the remaining seven sites.

Since 1207 instruments were forwarded to nineteen contact persons during the Christmas season, some contact persons decided to distribute them in January after the holidays. Furthermore, several other schools could not return their instruments on time because of school closings due to snow-storms that resulted in combined three weeks delay, resulting in a variable return-time. However, two weeks after the first mailing was made, follow-up post-cards were sent through contact persons expressing appreciation to teachers who had completed and returned their instruments, while at the same time, reminding those who had not responded to do so (Appendix C). The first mailing began on December 14, 1995. Return of completed questionnaires commenced on December 18 and ended on February 14. Nine instruments were returned after the return period expired, and were therefore not included in the analysis. A survey of nonrespondents was considered unnecessary because the established 55% return rate was exceeded. Furthermore, both the non-respondents and the participants represented the various geographical regions of Virginia.

The data was first subjected to descriptive analysis (Howell, 1992; Pedhazur & Pedhazur, 1991). Second, multivariate analysis of variance (MANOVA) was conducted (Stevens, 1992), using the Statistical Package for the Social Sciences (SPSS). To facilitate understanding of the analysis, research question number one is reproduced below:

Do stages of concern profile according to Hall, Wallace, and Dossett (1973) vary among teachers as a function of their levels of experience in the use of a school-wide education (HSTW) reform?

To address the first research question, means were computed for teachers according to experience levels. Comparison of the mean scores and presentation in a chart provided an answer to the change in teachers' stages of concern as a function of their experience in using the HSTW reform. For purposes of the analysis, groupings were as follows:

Non-users-no experience

Beginning users-more than 1, but not more than 12 months experience,

Medium users-more than 12, but not more than 24 months experience,

Maximum users-more than 24, months of experience.

The groupings was determined based on a study by Hall (1978) about teachers' stages of concern as a function of their experience in implementing team-teaching.

Further analysis was conducted by subjecting the data to multivariate analysis of variance (MANOVA) procedures. The procedure first determined if the concern profiles according to experience levels were parallel. Then the procedure determined whether the scores on each stage were coincident with one another. Finally, the procedure tested for equal means at each stage. The purpose of the test of levelness of means was to find the differences in mean levels, and differences in patterns of responses across the stages to facilitate more understanding of the profile. In applying MANOVA, Hotelling's T^2 was

used to test for parallelism among the concern scores for different teacher groupings (Griffith, 1993). Stevens (1992) gives T^2 as:

$$T^2 = k \mathbf{d}' \mathbf{S}^{-1} \mathbf{d} \text{ where,}$$

k = a constant involving group sizes,
 \mathbf{d} = the vector of mean differences,
 \mathbf{S} = the covariance matrix (p. 155).

According to Stevens (1992), the T^2 is a comparison of between-variability (given by \mathbf{d} vectors) to within variability (given by \mathbf{S}). The T^2 is then converted to F in order to test for significant parallelism of the stage scores among the independent variables thus:

$$F = \frac{n_1 + n_2 - p - 1 T^2}{(n_1 + n_2 - 2)p} \text{ where}$$

p = the number of dependent variables
 $n_1 + n_2$ = the total number of subjects (for two independent variables).
 Alpha level was set at .05.

The test for parallelism was carried out between the different independent variables across the seven dependent variables. Comparison of the dependent variables also tested for coincidence of the means, and the means for each stage were compared across each teacher grouping. The purpose was to verify whether the profile was level or flat. The SPSSX MANOVA program for profile analysis was used (Stevens, 1992 p. 487).

The second research question is represented below:

Do the concern profiles of teachers change when teachers are grouped according to teaching area, education level, hours of HSTW quality workshops attended, and adoption-proneness as they implement the HSTW reform?

For the second research question, group concern profiles were determined by using raw scores to compute group means for each stage. Group means were displayed in charts according to the following groupings:

1. Teaching area (Academic, Vocational);
2. Education level (Less than Associate Degree or Associate Degree, Bachelors Degree, Masters Degree, Masters Degree with at least 30 hours of credits, Doctoral Degree);
3. Hours of HSTW quality workshops attended, using the Median-Split method (Baumeister, 1990).
4. Adoption prone, also using the Median-Split method (Baumeister, 1990).

MANOVA was used because it enabled the researcher to test the overall hypotheses on parallelism, coincidence, and levelness of the profiles (Bray & Maxwell & Cole, 1995). Furthermore, it allowed for the mean differences in more than one dependent variables to be evaluated simultaneously. Parallelism implies the same mean difference among the scores of the seven stages.

Summary

The procedure used in conducting this study was described. The population was high school teachers participating in the HSTW reform in the Commonwealth of Virginia. Instruments used consisted of the SoC measures, adoption-proneness measures, and a demographic information section. Data collection was conducted by mail. The analysis methods included descriptive statistics and MANOVA.

Chapter Four

Findings

Introduction

The research results are presented in this chapter. To answer the first research question, results of the descriptive analysis and MANOVA procedures of teachers' stages of concern as a function of their experience levels are presented. The second research question was answered through MANOVA procedures and results that show teachers' concern profiles according to education levels, teaching areas, hours of reform-related training, and adoption-proneness. The alpha level for all MANOVA tests was set at .05.

Teachers' Concern Profiles as a Function of Experience

The first research question was:

Do stages of concern according to Hall, Wallace, and Dossett (1973) vary among teachers as a function of levels of experience in the use of a school-wide education (HSTW) reform?

Mean scores on the SoC questionnaire and standard deviations were used to show the results of teachers' concern profiles according to their HSTW implementation experience. Teachers were grouped into four categories: teachers in their third year of experience with the HSTW reform (N = 70), those in their second year (N = 230), those in their first year (N = 207), and those who had no experience with the reform (N = 131) (Hall, 1976). Results revealed that, in all but the management stage, differences existed

between the mean scores of teachers having no HSTW implementation experience and teachers in the first year of HSTW implementation, teachers in the second year, and teachers in the third year. While the concern profiles of teachers who had no experience revealed the highest concern at personal stage (22.57, S.D. = 7.61) and next highest at informational stage (20.36, S.D. = 6.27), the profiles of teachers in the third year of implementation revealed highest concern at the collaboration stage (21.49, S.D. = 8.12) and next highest at consequences stage (21.23, S.D. = 7.22). Teachers in the second year of implementation also showed peak concern at the consequences stage (20.13, S.D. = 6.73) (Table 1).

Multivariate analysis of variance (MANOVA) results revealed significant change in teachers' stages of concern as a function of teachers' experience levels. The Hotelling's T^2 revealed that experience was statistically significant, $F(21, 1880) = 12.32$ ($p < .05$). This significant result indicated that teachers' concern intensities at different experience levels were not parallel. Furthermore, the univariate F-Test revealed that teachers at different experience levels had significantly different concern peaks at the awareness stage $F(3, 634) = 44.18$ ($p < .05$), informational stage $F(3, 634) = 16.61$ ($p < .05$), personal stage $F(3, 634) = 8.76$ ($p < .05$), consequences stage $F(3, 634) = 11.05$ ($p < .05$), collaboration stage, $F(3, 634) = 15.07$ ($p < .05$), and refocusing stage $F(3, 634) = 6.88$ ($p < .05$). The univariate test, however, showed no significant difference in the concern intensities for teachers who had different experience levels at the management stage $F(3, 634) = .98$ ($p > .05$). Additional MANOVA tests of coincidence and levelness were unnecessary since the

Table 1. Multiple Range Test for Concern Profiles by Experience

<u>Experience levels</u>	<u>SoC Mean</u>	<u>SD</u>	<u>N</u>
Awareness			
No experience	14.72a	6.02	131
1st year	10.16b	5.68	207
2nd year	8.81c	5.77	230
3rd year	6.87d	3.92	70
Informational			
No experience	20.36a	6.27	131
1st year	18.43b	6.53	207
2nd year	16.72c	7.52	230
3rd year	13.64d	7.23	70
Personal			
No experience	22.57c	7.61	131
1st year	21.13c	6.93	207
2nd year	19.63b	8.42	230
3rd year	17.10a	8.29	70
Management			
No experience	15.54a	7.62	131
1st year	15.42a	6.91	207
2nd year	16.37a	7.80	230
3rd year	14.91a	7.84	70
Consequences			
No experience	16.57a	7.55	131
1st year	18.23b	6.21	207
2nd year	20.13c	6.73	230
3rd year	21.23c	7.22	70
Collaboration			
No experience	14.47a	7.12	131
1st year	17.27b	7.37	207
2nd year	18.59b	7.49	230
3rd year	21.49c	8.12	70
Refocusing			
No experience	10.79a	6.34	131
1st year	12.09b	5.88	207
2nd year	13.74c	6.53	230
3rd year	13.34c	6.57	70

Note. Means in each stage having different letters are significantly different at $p < .05$ in the Students-Newman-Keuls Multiple Range Test.

A post-hoc test, using the Student-Newman Keuls multiple range test (SPSS, 1990), revealed that at the awareness and informational stages, teachers in the third year of implementation had significantly different concern intensity than teachers with two years, one year, and no years of reform related experience (Table 1). At the personal stage, the concern profiles of teachers who had no implementation experience and those in their first year of implementation experience were not significantly different. There was no significant difference in the concern intensity of teachers in the third year of implementation and those in the second year at the consequences stage.

Consequences and collaboration concerns of teachers in the first year of implementation were more intense than the consequences and collaboration concerns of those who had no implementation experience. Furthermore, consequences and collaboration concerns of teachers in their second year of implementation were more intense than consequences and collaboration concerns of those in their first year of implementation. In addition, consequences and collaboration concerns of teachers in their third year of implementation were more intense than consequences and collaboration concerns of those in their first year. Generally, as the years of experience increased, teachers' concern intensity changed from intensities at stages 1, 2, 3 (awareness, informational, personal) toward intensities at stages 4, 5 (consequences, collaboration).

From Figure 3, it can be observed that the concern intensity increased from personal concerns to consequences and collaboration concerns as teachers gained experience in the use of HSTW reform. Teachers who had no experience with the reform

had highest concern at the personal stage and next highest concern at the informational stage. These two stages are among the first three stages which, according to the stages of concern theory (Hall, Wallace and Dossett, 1973), are of utmost concern to inexperienced users of educational innovations. The experienced users had highest concern at the collaboration stage and next highest at the consequences stage.

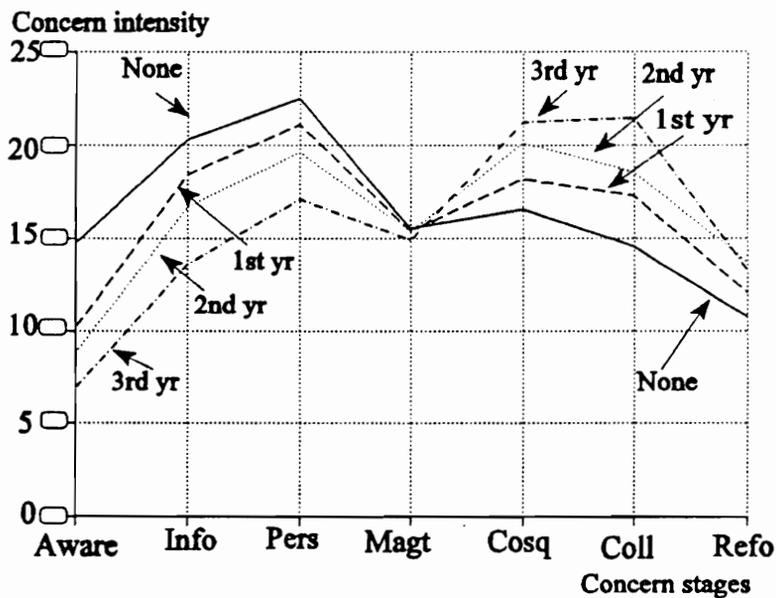


Figure 3. Graph of concern profiles by experience.

Generally, teachers who had no experience with HSTW reform expressed highest concern at one of the first three stages (personal concerns), followed by teachers in the first year of experience, teachers in the second year of experience, and then by teachers in the third year of experience. Conversely, teachers in their third year of HSTW implementation expressed peak concerns at the consequences and collaboration stages, followed by teachers in the second year of implementation. The concerns of teachers who

had no implementation experience were the least intense at the consequences and collaboration stages. Teachers' concern at the management stage were not as intense as their concerns at the personal, consequences, and collaboration stages.

Concern Profiles According to Other Teacher Characteristics

The second research question was:

Do the concern profiles of teachers change when teachers are grouped according to education level, teaching area, hours of HSTW quality workshops attended, and adoption-proneness as they implement the HSTW reform?

To answer this research question, results of the MANOVA procedures on teachers' concern profiles according to education levels are presented first, followed by the MANOVA and profiles according to teaching area, hours of HSTW related training, and adoption-proneness.

Concern profiles according to education levels.

Teachers' mean scores and standard deviations on the SoCQ teachers according to their educational levels are presented in Table 2. The results revealed the awareness concern intensities among teachers who had associate degrees or less (Mean = 10.91, S.D. = 8.42, N = 11), teachers who had bachelor's degrees (Mean = 10.47, S.D. = 6.03, N = 327), teachers who had masters degrees (Mean = 10.19, S.D. = 5.63, N = 222), those who had 30 credit hours above the master's degree (Mean = 9.71, S.D. = 6.17, N = 72), and

Table 2. Multiple Range Test for Concern Profiles by Education Levels

Education levels	SoC Mean	SD	N
Awareness			
Associate or less	10.91	8.42	11
Bachelors	10.47	6.03	327
Masters	10.18	5.63	222
Masters + 30 hrs.	9.71	6.17	72
Doctorate	6.33	3.88	6
Informational			
Associate or less	16.55	6.70	11
Bachelors	17.76	7.05	327
Masters	17.80	6.90	222
Masters + 30 hrs.	17.03	8.61	72
Doctorate	18.50	8.07	6
Personal			
Associate or less	21.09	10.45	11
Bachelors	20.68	7.68	327
Masters	20.22	7.71	222
Masters+ 30 hrs.	20.03	9.25	72
Doctorate	18.17	8.64	6
Management			
Associate or less	15.64	10.04	11
Bachelors	15.52	7.37	327
Masters	15.28	6.99	222
Masters + 30 hrs.	17.83	8.91	72
Doctorate	18.83	5.57	6
Consequences			
Associate or less	18.09	7.40	11
Bachelors	18.57	6.80	327
Masters	19.23	7.16	222
Masters + 30 hrs.	19.33	7.26	72
Doctorate	20.83	4.17	6
Collaboration			
Associate or less	17.09a	11.59	11
Bachelors	16.57a	7.39	327
Masters	18.26a	7.53	222
Masters + 30 hrs.	20.34c	8.20	72
Doctorate	22.50d	4.14	6
Refocusing			
Associate or less	12.09	7.06	11
Bachelors	12.13	5.90	327
Masters	12.91	6.47	222
Masters + 30 hrs.	13.61	7.78	72
Doctorate	10.67	5.47	6

Note. Means in each stage having different letters are significantly different at $p < .05$ in the Students-Newman-Keuls Multiple Range Test.

those who had doctoral degrees (Mean = 6.33, S.D. = 3.88, N = 6). Teachers who had 30 credit hours above the master's degrees revealed lower concern intensity at the awareness stage than teachers who had associate or less, bachelor's, and master's degrees. Teachers with doctoral degrees had the lowest awareness concern among the various educational levels.

The MANOVA results revealed statistically significant change in teachers' concern as a function of teachers' levels of education with the Hotelling's T^2 showing $F(28, 2502) = 2.09, p = .001 (p < .05)$. The results showed parallelism was not tenable (Steven, 1992). The univariate F-Test showed no statistically significant change in teachers' concern as a function of education levels at awareness stage $F(4, 633) = .96 (p > .05)$, information stage $F(3, 633) = .26 (p > .05)$, personal stage $F(3, 633) = .31 (p > .05)$, management stage $F(3, 633) = 1.95 (p > .05)$, consequences stage $F(3, 633) = .53, (p > .05)$, and refocusing stage $F(3, 633) = 1.18 (p > .05)$. However, the univariate F-Test revealed a significant change in teachers' concern as a function of education levels at the collaboration stage $F(3, 633) = 4.90 (p < .05)$. The Students-Newman-Keul range test showed significant collaboration concern among teachers who had doctoral level of education and those who had 30 hours above the masters degree (Table 2).

The relative intensities of concern profiles according to teachers' educational levels (Figure 4) indicated that teachers with doctoral level education had more intense collaboration concern. Teachers with the master's degree, and those with bachelor's, and associate degrees had concerns that appeared coincident and parallel at each stage. Furthermore, teachers who had doctoral degrees and those with 30 hours above the

master's degrees showed more intense and statistically significant collaboration concern than teachers who had other levels of education. Teachers' concern profiles did not change at the awareness, informational, personal, management, consequences, and refocusing stages as a function of teachers' education levels.

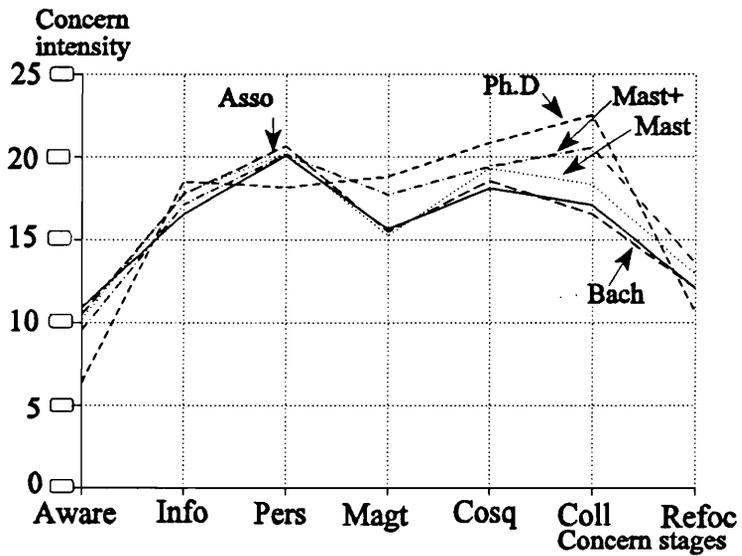


Figure 4. Graph of concern profiles by education level.

Concern profiles according to teaching areas.

Teachers' concern profiles according to teaching area is presented in Table 3.

With teachers' concern grouped according to teaching area, a mean of 10.46 was calculated (S.D. = 6.00) for academic teachers and a mean of 9.66 (S.D. = 5.85) for vocational teachers at the awareness stage. Teachers' profiles at the consequences stage

showed a mean of 19.04 (S.D. = 6.95) for academic teachers, and a mean of 18.51 (S.D. = 7.90) for vocational teachers. Corresponding profiles for the collaboration stage were 17.36 (S.D. = 7.61) for academic teachers and 18.51 (S.D. = 7.90) for vocational teachers.

When the data were subjected to MANOVA ($\alpha = .05$) change in teachers' concern as a function of teaching area was not statistically significant $F(7, 630) = 1.81, (p > .05)$. The result showed that parallelism was therefore tenable. The univariate F-Tests of the change in teachers' concern on each of the stages as a function of teaching area revealed no statistical significance, showing that coincidence was tenable. Specifically, teaching area effect at the awareness stage $F(1, 636) = 2.20 (p > .05)$, information stage $F(1, 636) = .55 (p > .05)$, personal stage $F(1, 636) = 1.50 (p > .05)$, management stage $F(1, 636) = 1.73 (p > .05)$, consequences stage $F(1, 636) = .70 (p > .05)$, collaboration stage $F(1, 636) = 2.55 (p > .05)$, and refocusing stage $F(1, 636) = 2.98 (p > .05)$ were not statistically significant.

Table 3. Concern Profiles by Teaching Area

<u>Teaching Area</u>	<u>SoC Mean</u>	<u>SD</u>	<u>N</u>
Awareness			
Academic	10.46	6.00	473
Vocational	9.66	5.85	165
Informational			
Academic	17.80	6.91	473
Vocational	17.32	7.90	165
Personal			
Academic	20.66	7.83	473
Vocational	19.78	8.18	165
Management			
Academic	15.96	7.36	473
Vocational	15.07	7.83	165
Consequences			
Academic	19.04	6.95	473
Vocational	18.51	7.00	165
Collaboration			
Academic	17.36	7.61	473
Vocational	18.51	7.90	165
Refocusing			
Academic	12.81	6.56	473
Vocational	11.82	5.77	165

Total N = 638

The graphs representing the two groups showed similar shape (Figure 5). From Figure 5 the notions of parallelism and coincidence were evident. It was also evident from Figure 5 that the effect of teaching areas on concern intensity was not flat. The concern profiles of teachers in this study did not change as a function of teachers grouped according to teaching areas. The intensity of concerns that academic teachers (N = 473) and vocational teachers (N = 165) had was parallel and coincident. However, the intensity of academic and vocational teachers' concerns was not flat with highest mean scores of 20.66, S.D. = 7.83 and 19.78, S.D. = 8.18 at the personal stage, and lowest mean scores of 10.46, S.D. = 6.00 and 9.66, S.D. = 5.85 at the awareness stage. The intensity at the personal stage was nearly twice the intensity at the awareness stage.

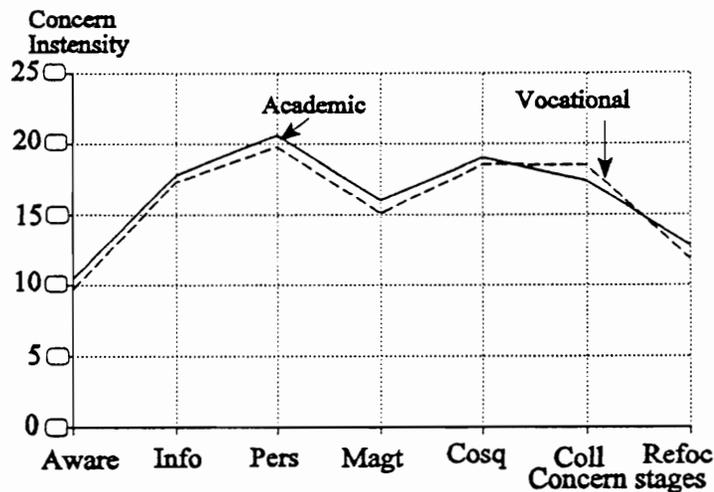


Figure 5. Graph of concern profiles by teaching area.

Concern profiles according to hours of HSTW related training.

Teachers were arranged into three groups for the purpose of analysis according to hours of reform-related training they had received. Using the median-split method (Baumeister, 1990), hours of training as indicated by teachers who had reform-related training were arranged into two groups. Group one consisted of teachers who had one to fifteen hours of HSTW related training (N = 221). Group two consisted of those who had more than 15 hours of reform related training (N = 199). Teachers in group three consisted of those who had no HSTW related training (N = 218).

Concern profiles arranged according to teachers' hours of HSTW related training are presented in Table 4. Results revealed that teachers who had 15 hours or less in reform-related training indicated highest concern intensity at the personal stage with a mean score of 20.51 (SD = 7.68), and next highest concern intensity at the consequences

stage with a mean of 18.49 (SD = 6.56). Conversely, teachers who had more than 15

Table 4. Multiple Range Test for Concern Profiles by Hours of HSTW Related Training

<u>Hours of Training</u>	<u>SoC Mean</u>	<u>SD</u>	<u>N</u>
Awareness			
None	12.83a	6.04	218
≤ 15 hours	10.07b	5.79	221
> 15 hours	7.63c	4.70	199
Informational			
None	19.55a	6.68	218
≤ 15 hours	17.91b	6.87	221
> 15 hours	15.37c	7.42	199
Personal			
None	21.78a	7.68	218
≤ 15 hours	20.51a	7.68	221
> 15 hours	18.86b	8.21	199
Management			
None	16.48a	7.60	218
≤ 15 hours	15.04a	7.07	221
> 15 hours	15.68a	7.78	199
Consequences			
None	17.69a	7.13	218
≤ 15 hours	18.49a	6.56	221
> 15 hours	20.68b	6.88	199
Collaboration			
None	15.54a	7.30	218
≤ 15 hours	16.96b	7.20	221
> 15 hours	20.72c	7.71	199
Refocusing			
None	11.94a	6.31	218
≤ 15 hours	12.17a	6.32	221
> 15 hours	13.66b	6.41	199

Note. Means in each stage having different letters are significantly different at $p < .05$ in the Students Newman-Keuls Multiple Range Test.

hours of reform-related training indicated highest concern intensity at the collaboration stage with a mean score of 20.72 (S.D. = 7.71), and second highest concern intensity at the consequences stage with a mean of 20.68 (S.D. = 6.88). Teachers who had no related training had highest concern intensity at the personal stage and second highest concern

intensity at the informational stage.

The Hotelling's T^2 ($\alpha = .05$) revealed that change in teachers' stages of concern as a function of hours of reform-related training was statistically significant, $F(14, 1256) = 12.12$ ($p < .05$). Parallelism was thus not tenable. The Univariate F-Test of change in teachers' concern intensity at each concern stage as a function of hours of reform-related training revealed statistically significant differences for all stages except the management stage. Specifically, changes in the awareness stage $F(2, 635) = 45.62$ ($p < .05$), informational stage $F(2, 635) = 18.81$ ($p < .05$), personal stage $F(2, 635) = 7.24$ ($p < .05$), consequences stage $F(2, 635) = 10.47$ ($p < .05$), collaboration stage $F(2, 635) = 27.00$ ($p < .05$), and refocusing stage $F(2, 635) = 4.45$ ($p < .05$) as a function of reform-related training revealed significant differences. Hours of reform-related training had no statistically significant effect on the management stage $F(2, 635) = 2.04$, $p = .13$ ($p > .05$).

The profiles showed that teachers who had no reform-related training had peak concern at the personal stage while those who had more than 15 hours of reform-related training had peak concern at the collaboration and consequences stages (Figure 6). Teachers who had 15 hours of reform-related training or less had lower personal concern intensity than those who had no training, but higher intensity than those who had more than 15 hours of related training. Conversely, teachers with 15 hours of training or less had lower consequences and collaboration concerns than teachers who had more than 15 hours of training, but higher concerns than teachers who had no related training.

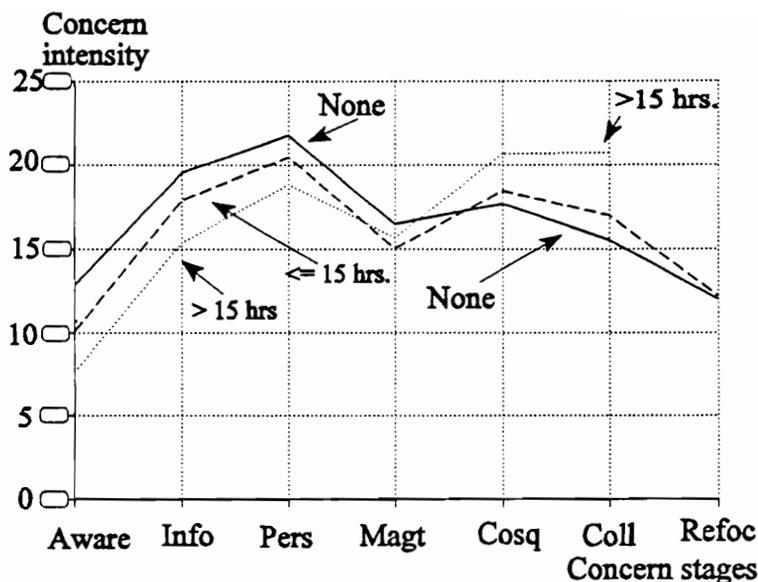


Figure 6. Graph of concern profiles by hours of related training.

Concern profiles according to teachers' adoption proneness.

The median-split method was applied to arrive at two groups of teachers (Baumeister, 1990). The method required that the mean score of all the teachers who participated in the study be calculated and utilized in grouping individual scores as above the mean or below the mean. Teacher scores of 85 or less points on the adoption-proneness inventory were in one group (N = 328), while teachers who scored more than 85 points on the inventory (N = 310) were in the other group (Table 6). The maximum score on the inventory was 119 while the minimum was 43.

Teachers who were more adoption-prone revealed highest concern at the consequences stage with a mean of 20.61 (S.D. = 6.92) and the next highest concern at both the personal stage (mean = 20.50, S.D. = 8.15) and collaboration stage (mean =

20.30, S.D. = 7.51). On the other hand, teachers who were less adoption-prone revealed highest concern at the personal stage with a mean of 20.37 (S.D. = 7.72) and the next highest concern at the informational stage with a mean of 18.02 (S.D. = 6.75).

Table 6. Concern Profiles by Adoption-proneness

Scores on AI	Mean	SD	N
Awareness			
≤ 85	11.46	6.12	328
> 85	8.97	5.48	310
Informational			
≤ 85	18.02	6.75	328
> 85	17.31	7.59	310
Personal			
≤ 85	20.37	7.72	328
> 85	20.50	8.15	310
Management			
≤ 85	15.99	7.33	328
> 85	15.46	7.66	310
Consequences			
≤ 85	17.28	6.62	328
> 85	20.61	6.92	310
Collaboration			
≤ 85	15.14	7.00	328
> 85	20.30	7.51	310
Refocusing			
≤ 85	12.06	6.10	328
> 85	13.08	6.63	310
			Total N = 638

When the data were subjected to MANOVA procedures, with an alpha level of .05, the Hotelling's T² revealed that change in adoption-proneness as a function of teachers' stages of concern was statistically significant, $F(7, 630) = 14.53$ ($p < .05$). The result showed that

parallelism was rejected. A univariate F-Test at an alpha level of .05 revealed significant effects of adoption-proneness at the awareness stage $F(1, 636) = 29.20, (p < .05)$, consequences stage $F(1, 636) = 38.70 (p < .05)$ collaboration stage $F(1, 636) = 80.70 (p < .05)$ and refocusing stage $F(1, 636) = 4.07 (p > .05)$. There was, however, no significant effect of adoption-proneness on teachers' concerns at the informational stage $F(1, 636) = 1.56 (p > .05)$, personal stage $F(1, 636) = .05 (p > .05)$ and management stage $F(1, 636) = .79 (p > .05)$.

Figure 7 shows the relative intensity of concern profiles according to teachers' adoption-proneness. Teachers' concern profiles revealed distinct profile characteristics of teachers' concerns when grouped according to teachers' adoption-proneness. While all the teachers revealed similar informational, personal, and management concerns, teachers who

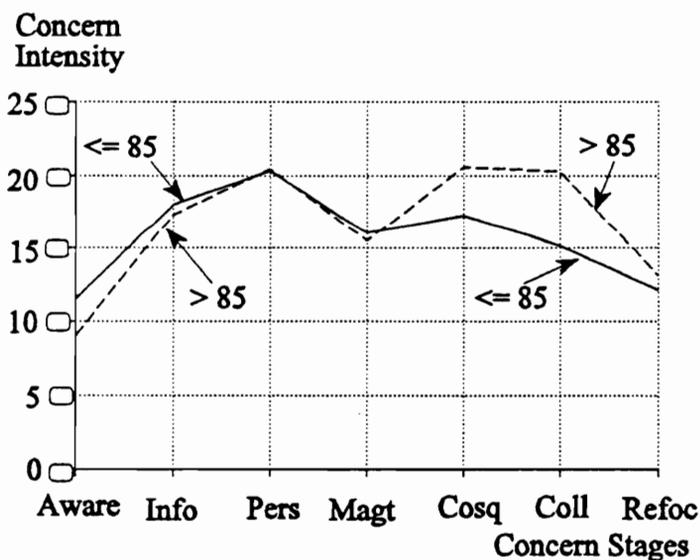


Figure 7 Graph of concern profiles by adoption-proneness.

scored higher on the adoption-proneness inventory had more intense concerns at consequences and collaboration stages than teachers who scored lower. Teachers' concern profiles, therefore, varied to some extent as a function of teacher adoption-proneness.

Summary

Analysis of teachers' concern profiles according to their HSTW reform experience revealed that teachers with more experience were more intensely concerned at the consequences and collaboration stages while those with less experience were more intensely concerned at the informational and personal stages. Teachers in the third year of implementation were more concerned at the consequences and collaboration stages, followed by teachers in the second year of implementation and those in the first year of implementation. Teachers who had no reform-related experience had the lowest level concern at the consequences and collaboration stages. The MANOVA results indicated significant differences between experience groups, and between each of the concern stages.

In response to the second research question, teachers' concern profiles did not change when teachers were grouped according to teaching areas. In addition, concern profiles did not change when teachers were grouped according to education levels for teachers who had associate, bachelor's, and master's degrees. Teachers exposed to more hours of reform-related training had more intense concern at the consequences and collaboration stages, while those with fewer hours of training had more intense concern at the personal stage. Teachers who had no reform-related training showed most intense concern at the personal stages and the least intense concern at the consequences and collaboration stages. Furthermore, teachers who scored higher on the adoption-proneness

showed more intense concern at the consequences and collaboration stages, while those who scored lower were more concerned at the personal level. All the teachers surveyed had about the same level of concern for the management stage.

Chapter Five

Summary, Conclusions, and Implications

A summary description of how the study was conducted is provided in this chapter. Next, conclusions reached based on the findings are presented. And finally, implications of the results for research and for practice are summarized.

Summary

Educational reform and innovation.

As a consequence of continuous technological change, more complex skills and knowledge are required to perform successfully in the workplace. Future workers need skills and knowledge that enable them to adapt to continuously changing technology and associated job skills. Educational leaders have responded to these concerns by undertaking various educational reforms and innovations. These educational reforms and innovations have, to some degree, evolved from a philosophical base.

Dewey and his followers believed that education should facilitate realization of the country's democratic promises and warned against narrow utilitarianism in education, which promotes "pseudo-reforms of utilitarian trade training" (Wirth, 1972, p. 173). Education reform may eventually lead to economic benefits, but should not compromise individual liberty. Snedden and Prosser, on the other hand, saw education as the means of meeting social efficiency and life adjustment needs. To them, training in trades and businesses was a legitimate obligation of public education. Differentiated programs should

be created to match the capacities of children's different classifications. Separate education should then provide separate preparation to different children on the basis of these classifications.

Since this ideological dialogue took place between Dewey and Prosser and Snedden, leaders in politics, education, and industry have continued to respond to social efficiency and equality, and individual liberty through various educational programs and opportunities. As the concerns these leaders had about knowledge, skills, and technological society change, education reform and innovation processes continued. For instance, leaders responded to the industrial revolution by incorporating the practices and habits of industry into the educational system (Baker, Boser, & Householder, 1992). Furthermore, the Smith-Hughes Act (Wirth, 1972), the more recent Perkins II Legislation (American Vocational Association, 1990, p. 66), and the School-to-Work Transition Act (Hoerner & Wehrley, 1994) were efforts by educators and political leaders to respond to work-place skill requirements. The Southern Regional Education Board (SREB) has been responding to these skill and knowledge needs through various reform activities (Bottoms, 1993).

In 1987, the SREB created a region-wide schools reform titled "High Schools That Work" (HSTW) (Bottoms, 1995). The reform was established in response to the skills and knowledge needed by students to prepare them for participation in the nation's high technology workplace. The reform also aims at improving students' capacity for continuous learning as technology changes. As a school-wide reform, HSTW focuses on changing school structure from the departmentalized management of instruction to an

integrated arrangement. The boundaries between subjects and programs are being eliminated and cooperation and collaboration among all teachers are increasingly being encouraged. Teachers of science, mathematics, English and communications, social studies, and vocational subjects work together in developing and implementing the HSTW reform.

In recent years, teachers' concern about educational reforms has become more and more important. Education reforms continue to respond to changing workplace (Wirth, 1972), and teachers cope with the continuous reforms. In response to the continuous change, school subjects reflect the reality of technological world beyond the school (Oaks & Pedras, 1992). It is important to prepare students for the ever changing technological world. However, it is equally important to respond to teachers' concerns in ways that will enable them to prepare students effectively. Such concerns are identified as appearing in stages and intensities according to the stages of concern theory (Hall, Wallace & Dossette, 1973).

Stages of concern theory and research.

The stages of concern (SoC) theory describes individuals' feelings and attitudes as they consider, approach, and implement an educational innovation (Hall, Wallace, and Dossette, 1973). The theory relates to individuals engaged in innovation implementation and how their concerns change as a function of innovation related experience from intensity at the awareness, informational, and personal stages to intensity at the management stage, and finally to intensity at the consequences and collaboration stages. According to the

theory, teachers first express self-concerns, and then task concerns as they gain experience in the use of educational innovation, and finally, concerns about students and other teachers. Seven stages of concern termed awareness, informational, personal, management, consequences, collaboration, and refocusing stages were identified by Hall, Wallace and Dossette (1973).

The awareness concerns reveal lack of knowledge, information, and implications of the innovation for non-users or beginning users. The innovation user is aware of the innovation at the informational stage, but has become interested in learning more about it. An intense concern at this stage indicates readiness to learn more about the innovation. Personal concerns indicate doubts about the innovation and a regard of the innovation as a threat. High management concerns result from concerns about innovation resource application, time management, and techniques of innovation implementation. The consequences stage relates to thinking about impact of the innovation on students and other teachers, and how to effectively implement the innovation for maximum benefit to students. Collaboration concerns relate to frustrations expressed by teachers for not knowing the activities of other teachers involved in the innovation. Teachers with high refocusing concern are knowledgeable about the innovation. Such teachers also have their own opinion about the direction they think the innovation should be going.

Several studies have been conducted that lend support to the stages of concern theory. The stages of concern profiles of teachers implementing teaming and professors implementing instructional modules confirmed existence of the seven stages of concern among teachers and professors (Hall & Rutherford, 1976). The more years of experience

teachers gained implementing teaming, the less intense their awareness, informational and personal concerns about teaming and the more intense their management, consequences, and collaboration concerns. Teachers who had no experience with teaming had intense concerns at awareness, informational, and personal stages. Rogers (1992), Linnell (1991), and Rogers and Mahler (1994) found that technology teachers had varied concern profiles about technology education. Some teachers who had no experience with technology education had intense concerns at the awareness, informational and personal stages and others who had more experience in implementing technology education had intense concerns at the management, consequences, and collaboration stages.

Stages of concern of teachers implementing microcomputers in their classrooms (Cicchelli & Baecher, 1989) and teachers implementing educational computing (Wedman & Heller, 1984) have also been studied. Teachers who revealed intense collaboration concern had more implementation experience than teachers with awareness, informational, and personal concerns. The concern theory was also applied in the study of teachers' concern about bench-mark testing (Kimpston, 1987; Kimpston & Anderson, 1988), multimedia technology (Maney, 1994), and acceptance of science, technology, and society concept (Scharmann & McLellan, 1992). High percentages of teachers and principals reported similar concern intensity about the science, technology, and society concept. After two years of bench-mark testing, teachers' concern profiles improved from intensities at awareness, informational, and personal stages to intensities at the management, consequences, and collaboration stages. Furthermore, teachers' concern about in-service training programs was studied, using a pre-post test design (Broyles & Tillman, 1985;

Knowles, 1981). Their concerns had higher intensities at the awareness, informational, and personal stages before the training. However, the concern intensity at the awareness, informational, and personal stages were greatly reduced after they had undergone the training session. In addition, the stages of concern of educational professionals, including administrators, counselors, vocational teachers, and academic teachers, about tech prep were studied by Long (1994), and Dennison and Echternacht (1993). Significant differences were found in the concern stages and intensities between vocational and academic educators, administrators, and counselors.

In the above studies, other variables besides innovation users' experience were studied. Teachers' concern profiles were studied according to their education levels (Rogers & Mahler, 1994; Cicchelli & Baecher, 1989; Heller, 1984; Rogers, 1992), and according to related training (Scharmann & McLellan, 1992; Broyles & Tillman, 1985; Knowles, 1981). The stages of concern profiles were found to change as a function of education levels, innovation related training, and teaching area. It was also found that adoption-proneness related to innovation users' perceptions about the innovation adoption-process. Those who were more adoption-prone were more disposed to try an innovation than those who were less adoption-prone (Oscarson, 1977; Oscarson & Finch, 1980). The more teachers sought new information (informational) and revealed more desire to interact with other teachers (collaboration), the more they tended to adopt an innovation.

Based on these concern studies, several variables that related strongly with stages of concern had potential for study. These variables included teachers' innovation-related experience, teachers' education levels, teachers' areas of teaching, and hours of innovation

related training. Adoption-proneness was an additional variable that was included because of its' relationship to the innovation adoption process and innovation users' perceptions. Furthermore, inclusion of adoption-proneness was based on the fact that some variables used in stages of concern studies were also used in adoption-proneness studies.

Studying the stages of concern theory in a school-wide educational reform context was deemed important because of paucity of research in this area. Additionally, results might provide a better understanding of the SoC theory in a school-wide educational (HSTW) reform context. Knowledge of teachers' stages of concern about a school-wide educational reform may facilitate, to some extent, knowledge about the levels and types of interventions needed for effective reform implementation. Appropriate intervention can, ultimately, result in effective use of resources and in reducing some reform concern-related difficulties among teachers implementing a school-wide education reform. Furthermore, knowledge of teachers' concern profiles in a particular reform context can provide more understanding of the change in concern intensity and concern stage as functions of change. The study of teacher concern about a school-wide educational reform was considered important because contemporary educational reforms continue to stress involvement of all school staff, and others outside the school (Murphy, 1992).

Purpose.

This study had two purposes. The first was to verify the stages of concern theory (Hall, Wallace, and Dossette 1973) in a school-wide educational reform context. The second purpose was to determine if changes in teachers' concern profiles varied as a function of education levels, teaching areas, hours of reform related training, and adoption-proneness. Teachers' concern was studied within the specific context of implementing the High Schools That Work (HSTW) reform in Virginia. As a school-wide education reform (Murphy, 1992), the HSTW reform focuses on both process and outcome, and includes all educators, parents, students, and others in designing and implementing strategies to achieve the reform outcome. The outcome includes creating integrated academic and vocational education and eliminating the traditional general education track (Jorgeson, 1995). It also includes preparation of students for continuing education and for effective competition in the global economy. More specifically, answers were sought to the following questions:

1. Do stages of concern profiles according to Hall, Wallace, and Dossette (1973) vary among teachers as a function of their levels of experience in the use of a school-wide education (HSTW) reform?
2. Do the concern profiles of teachers change when teachers were grouped according to teaching area, education level, hours of HSTW quality workshops attended, and adoption-proneness as they implement the HSTW reform?

Participants.

The purposive sample consisted of all 30 sites that were involved with the HSTW reform in Virginia. Letters requesting participation in the study and seeking assistance in distributing the SoCQ were sent to HSTW coordinators for each of the thirty sites. After extensive communication through fax-letters, mail-letters, and phone calls, contacts were established with coordinators at twenty three (76.7%) of the 30 sites. Of the 23 sites, 19 participated in this study, representing 82.6% of the sites where contacts were successfully established. One site could not participate because of involvement with evaluation of block scheduling. Three other sites required personal interviews with various school officials before approval would be given to gather information. This requirement was turned down to keep within anonymity provisions specified by the Virginia Tech Human Subject Review Board. The teacher sample consisted of all 1207 teachers at the 19 sites that participated in the study.

Instrumentation.

To answer the research questions, a composite instrument containing three sections was used to collect data. The first section consisted of the Stages of Concern Questionnaire (SoCQ) (Hall, Wallace, & Dossette, 1973) having 35 concern related items with Likert type scales for completing each item. The second section consisted of the adoption-proneness inventory (AI) having 17 items with Likert type scales (Oscarson, 1977). The third section was used to collect demographic information relating to experience, area of teaching, education level, and hours of related training.

SoCQ reliability ranging from .42 to .86 has been documented (Hall, George, Rutherford 1977; Cunningham, Hillison, and Horne 1985; Bailey and Palsha 1992). Hall, et al. used 830 teachers and professors to confirm SoCQ construct validity. Seventy two percent of the items correlated more highly with the stages to which they had been assigned than with any other stage. In addition, Bailey and Palsha (1992) found a high degree of correspondence between scale scores and related interview data. A reliability of .95 was computed using the adoption-proneness inventory (Oscarson, 1977). Using 40 vocational teachers' ideas, practices, and products, and their scores on the adoption-proneness inventory, the concurrent validity was established as .44. Positive correlation coefficients between items ranged from .31 to .81.

Data collection.

One thousand two hundred and seven questionnaires, including self-addressed and stamped envelopes for easy returns were mailed to site coordinators. Three weeks after the first mailing was made, follow-up post-cards were mailed to schools where responses had been received, thanking teachers who already responded while, at the same time, reminding teachers who had not responded to do so. Because the distribution period fell within the Christmas vacation, five site coordinators distributed the SoCQ after the vacation period. In addition, severe weather delayed the return of some completed questionnaires. Consequently, the date of acceptance of returns was extended by three weeks.

Of the 677 questionnaires that were returned, 638 were usable and therefore were

included in the data analysis. Twenty two of the 39 unusable questionnaires had uncompleted sections. Eight questionnaires were completed by counselors who were not classified as teachers. Nine questionnaires were returned after the acceptance date had passed.

Data analysis.

Descriptive statistics were used to profile teachers' concerns according to teachers' HSTW reform experience. Furthermore, the multivariate analysis of variance (MANOVA) procedure was applied to analyze profiles according to teachers' implementation experience. Subsequently, MANOVA procedures and descriptive statistics were used in the analysis of teachers' concern profiles according to their education levels, teaching areas, hours of HSTW reform-related training, and adoption-proneness.

Findings.

Results revealed that teachers having no HSTW implementation experience (N = 131) had peak concern at the personal stage, followed by teachers in their first year of implementation (N = 207), and teachers in their second year of implementation (N = 230). Teachers in the third year of implementation (N = 70) had the least concerns at the awareness, informational, and personal stages and had peak concerns at the consequences and collaboration stages. When the data according to implementation experience were subjected to MANOVA procedures, the Hotelling's T^2 at .05 alpha level revealed

significant differences between the seven stages of concern, $F(21, 1880) = 12.32$ ($p < .05$). The results showed that parallelism was not tenable. Furthermore, the univariate F-Test revealed that teachers at different experience levels had significantly different concern peaks at the awareness stage $F(3, 634) = 44.18$ ($p < .05$), informational stage $F(3, 634) = 16.61$ ($p < .05$), personal stage $F(3, 634) = 8.76$ ($p < .05$), consequences stage $F(3, 634) = 11.05$ ($p < .05$), collaboration stage, $F(3, 634) = 15.07$ ($p < .05$), and refocusing stage $F(3, 634) = 6.88$ ($p < .05$). The univariate test, however, showed no significant difference in the concern peaks for teachers having different experience levels at the management stage, $F(3, 634) = .98$ ($p > .05$). Subsequent MANOVA tests of coincidence and levelness were unnecessary since the profiles were not parallel (Stevens, 1992).

When the data were analyzed according to teachers' education levels, the concern profiles of teachers with different educational levels, except teachers with doctoral level, did not change at the awareness, informational, personal, management, consequences, and refocusing stages. Teachers with doctoral level education ($N = 6$) had more intense concerns at the collaboration stage. Teachers' concern profiles, at all the stages except the collaboration stage, did not change as a function of education level. The MANOVA results ($\alpha = .05$) revealed that change in teachers' concern intensity as a function of education level was statistically significant $F(28, 2502) = 2.09$ ($p < .05$). The univariate F-Test, however, revealed that only change in collaboration concern as a function of education level was statistically significant $F(3, 633) = 4.90$ ($p < .05$).

The concerns of teachers involved in implementing the HSTW reform did not change when teachers were grouped according to teaching areas (Vocational $N = 165$,

Academic $N = 473$). When the data were subjected to MANOVA, the effect of teaching areas on teachers' stages of concern was not statistically significant $F(7, 630) = 1.81$ ($p > .05$). The concern intensity was parallel and coincident but not level.

Using the median-split method (Baumeister, 1990), teachers' concern profiles were grouped according to hours of HSTW related training. The mean hours of reform-related training for those teachers who had any form of training was calculated. Teachers-scores were placed in one of two groups, those who had more than 15 hours of reform-related training and those who had not more than 15 hours of reform-related training. Teachers who had no related training comprised the third group.

Results indicated that the intensity and stages of teachers' concern profiles changed when teachers were grouped according to hours of reform related training. Teachers who had more than 15 hours of training ($N = 199$) had peak concerns at the consequences and collaboration stages, while teachers who had no related training ($N = 218$) had peak concerns at the personal and informational stages. Teachers who had less than 15 hours of related training ($N = 221$) also showed peak concerns at the personal and informational stages, although their concerns were less intense at both stages than the concerns of teachers who had no training. As the hours of training increased, teachers' concerns increased in intensity at the consequences and collaboration stages and decreased at the informational and personal stages. The Hotelling's T^2 at an alpha level of .05 revealed that the effects of hours of reform related training on teachers' stages of concern was statistically significant, $F(14, 1256) = 12.12$ ($p < .05$). The result showed that parallelism was not tenable.

Teachers-scores were arranged into two groups, using the median-split method (Baumeister, 1990). The mean score of all the teachers who participated in the study was calculated. Each participant-score belonged to one of two groups. Scores higher than the mean belonged to one group, while those that were not more than the mean belonged to the other group. Scores of 85 points or less ($N = 328$) on the AI were placed in one group, while scores that were more than 85 points ($N = 310$) on the AI were placed in second group.

Teachers who scored more than 85 on the AI had peak concerns at consequences and collaboration stages but there were similar concern intensities at awareness, informational, and personal stages for both groups. When teachers were grouped according to their adoption-proneness, the concern profiles of teachers changed only at the consequences and collaboration stages. When the data were subjected to MANOVA procedures, the Hotelling's T^2 revealed that change in teachers' stages of concern as a function of adoption-proneness was statistically significant, $F(7, 630) = 14.53$ ($p < .05$). The result showed that parallelism was rejected.

Conclusions

This study revealed that teachers' stages of concern profiles about a school-wide education reform vary as a function of teachers' implementation experience. The stages of concern theory according to Hall, Wallace and Dossette (1973), hypothesized that individuals placed in an innovation situation are initially guided by personal concerns and the demands that new situations make upon them. As personal concerns become resolved,

individuals shift to concerns about the nature of the task and concerns about quality of task performance. The study results support this hypothesis as proposed in the theory.

Teachers having no HSTW implementation experience expressed more intense concern at the personal stages (awareness, informational, and personal). Furthermore, teachers in the third year of implementation expressed intense concern at the consequences and collaboration stages. The more experience teachers had, the more intense their concern profiles appeared to be at the consequences and collaboration stages, and the less intense at the informational and personal stages.

In terms of education levels, teachers' stages of concern did not appear to change as a function of education level. The fact that teachers with doctoral level education were more concerned at the collaboration stage may be discounted because of the relatively small number of participants at that level ($N = 6$). Their responses may also be questioned because some teachers with doctoral level degrees could be more involved in management than teachers with other levels of education. Teachers with other levels of education had similar intensities at awareness, informational, personal, and management stages as well as at the consequences and refocusing stages, showing that teachers' concern profiles did not change as a function of teachers' education levels, except at doctoral level. Results of this study reinforce the results of a study conducted by Rogers and Mahler (1994) in which there was no statistically significant difference between teachers' concerns when grouped according to their education levels.

As with education levels, teachers' concern profiles did not change as a function of teaching area. Vocational teachers ($N = 165$) and academic teachers ($N = 473$) had parallel

and coincident concerns throughout the seven stages, but the concern intensities were not flat. Academic and vocational teachers revealed highest concern intensity at the personal stage and the lowest concern intensity at the awareness stage. Teachers' concern profiles in this study did not change as a function of teachers' teaching area.

This concern result according to teaching area supports studies about bench-mark testing in which principals and teachers reported similar stages of concern (Kimpston & Anderson, 1988). However, the result did not concur with the results of studies conducted by Dennison and Echternacht (1993) and Long (1994) where significant differences were revealed in the stages of concern about tech prep between vocational and academic teachers, administrators, and counselors. It should be noted that the current school-wide concern study involved only teachers, and did not include principals or other administrators, or counselors. In the Dennison and Echternacht (1993), and Long (1994) studies, the participants included principals and other administrators, and counselors. Additionally, the studies examined reform in program-defined parts of the school rather than reform involving the entire school. Perhaps, the differences in the magnitude of reform and the breadth of school personnel involved contributed to the difference.

Results of this study focusing on concern profiles according to related training support studies by Broyles and Tillman (1985), and Knowles (1981) that indicate intensity of awareness, informational, and personal concerns were greatly reduced after reform related training sessions. Teachers who had 15 hours of reform related training or less had consequences and collaboration concern intensities which appeared higher than the consequences and collaboration concern intensities of those who had no training, but lower

than the intensities of those who had more than 15 hours of training. The current results also support results of a study by Scharmann and McLellan (1992) that examined change connected with an in-service workshop. Teachers' concern intensities change from the awareness, informational, and personal stages before the workshop to consequences, collaboration, and refocusing stages after the workshop. Teachers' concern profiles, therefore, changed as a function of hours of reform related training.

There was change in teachers' concern profiles as a function of teachers' scores on the adoption-proneness inventory. Teachers who were more adoption-prone (> 85 on the AI) had peak concerns at the consequences and collaboration stages, while teachers who were less adoption-prone (< 85 on the AI) had peak concerns at the personal stage and second highest concern at the informational stage. A study by Rogers and Mahler (1994, p. 19) concluded that concern intensities at the management, consequences, and collaboration stages show acceptance of educational innovation. The present study provides additional support for the above conclusions. Teachers who score more than 85 points on the AI revealed more consequences and collaboration concerns and, in line with the Rogers and Mahler (1994) conclusions, would be more disposed to accept the HSTW reform than teachers who score less than 85 on the AI. Such teachers according to Oscarson (1977), and Oscarson and Finch (1980) have certain characteristics that made them more disposed to adopt an educational innovation than others.

Implications

The stages of concern theory (Hall, Wallace & Dossette, 1973) was verified, using teachers' experience with a school-wide educational reform. Concern stages and intensity were shown to change as a function of change in innovation related experience. The stages of concern were also shown to change as a function of change in two other variables, hours of reform related training and adoption-proneness. As more hours of related training were gained, the concern intensity improved from awareness and informational concerns to consequences and collaboration concerns. In addition, the higher the adoption-proneness of innovation users, the more intense at the consequences and collaboration stages their concern. In light of these findings, implications are provided for research and for practice.

Implications for research.

Previous studies revealed that training can change teachers' concern intensities from awareness, informational, and personal stages to management, consequences, and collaboration stages (Scharmann and McLellan 1992; Tillman 1985; and Knowles 1981). Reform-related training exposes innovation users to innovation related experience. A longitudinal study of teachers' concern in response to a school-wide educational reform-related training will provide more knowledge about the stages of concern. While the stages of concern theory points to the reform users' concern intensities, the causes of such concerns still remain for researchers to confirm.

Adoption-proneness suggests that certain mental, physical, and professional attributes exist as determinants in explaining proneness of teachers to adopt an educational

innovation (Oscarson, 1977), and in this case, to have peak concerns at the consequences and collaboration stages. Oscarson (1977), and Oscarson and Finch (1980) identified characteristics that make some teachers more disposed than others to adopt an educational innovation. Therefore, should teachers who are more adoption-prone be introduced to an educational innovation before other teachers? What relationship, if any, exists, between school-wide educational innovation users' adoption-proneness and their stages of concern? A study that relates adoption-proneness to stages of concern within a school-wide reform context would provide an additional knowledge-base that could lead to a better understanding of both the stages of concern theory and adoption-proneness.

Teachers' concern intensity was shown to be generally low at the management stage. This low management concern suggests that teachers are not as concerned about time and logistics aspects of the reform. Could it be that teachers had less involvement with management functions during the implementation of HSTW reform? Could it be that they were not empowered to participate in the management of HSTW implementation at their own levels? Or could it be that teachers were so involved in the management of the HSTW reform that they were no longer intensely concerned at the management stage? A study of teachers' involvement in management of the reform at various levels could provide useful information about the extent to which they are empowered to implement the school-wide reform.

Implications for practice.

The stages of concern profiles in the present study were shown to change when teachers were grouped according to experience, training, and adoption-proneness. Some teachers (N= 131) had no HSTW implementation experience, and some (N = 218) had no HSTW reform-related training, while others (N = 221) had less than 15 hours of related training. Teachers with less training should be identified and enrolled in workshops where the reform experience could be presented to them. Reform-related in-service training has great potential to serve as an appropriate and effective method of exposing teachers to the HSTW reform experience. After gaining reform-related experience from such training, teachers' concerns should change from the informational and personal stages to management, consequences, and collaboration stages (Tillman, 1985; Knowles, 1981).

Caution is in order because teachers with no HSTW experience and those in the first year of implementation had their peak concern at the personal stage and the second highest concern at the informational stage. Profiles of this type depict various degrees of doubt with and potential resistance to the innovation (Hall, George, & Rutherford, 1977, p. 45). In this instance, personal concerns become more important to the reform users than learning more about the reform. Consequently, these personal concerns need to be reduced before such individuals can consider a proposed reform objectively. The reform-related training should, therefore, begin with identification of the personal concerns. Once personal concerns are identified, and appropriate interventions applied, reform-related training can then proceed with maximum efficiency.

Training relating to personal concerns should address the effect of the reform on

teachers in relation to other teachers and other school personnel. The management changes resulting from the reform implementation should also be clarified. The time and energy required to implement the reform should be addressed in the in-service training. In handling personal concerns, personal support is important to teachers. The reform's relationship to existing practice as well as the reform's relevance to various teacher groups should be stressed. It should be noted that consequences concern is also high. The relevance of the reform to students and other teachers should, therefore, be explained. Above all, personal concerns should be legitimized to increase support and implementation of the reform (Hall, 1979, p. 206). Empowering teachers in terms of classroom and subject management can lower concern at personal level.

Furthermore, about half the teachers who participated in this study (N = 310) scored more than 85 in the AI. Teachers with higher level of adoption-proneness should be identified and introduced to educational reforms before others. Their positive dispositions to try a new innovation has potential to influence other teachers to try the innovation. Although, care must be taken in identifying these teachers to avoid ethical problems of regarding some teachers as less adoption-prone. Success of change or innovation implementation can be influenced through the identification of early adopters.

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Appendix A

Letters Sent to Local Pilot Site Coordinators Requesting Participation in the Study

Virginia Tech
Blacksburg, VA 24061-0254

Local Pilot Site Coordinator

Dear Mr/Ms/Dr.:

We are currently conducting a study focusing on teachers' stages of concern about implementing a school-wide education reform. This study, which focuses on the High Schools That Work (HSTW) reform, will provide high schools with useful information about how teachers view educational reform as they are involved with the change process. To complete this study, we need your assistance in distributing a concern questionnaire to teachers in your school who are involved with the HSTW reform.

The Questionnaire will take about 15 minutes to complete and contains sections relating to stages of concern, adoption-proneness, and biographical information. All responses will be voluntary and treated in a confidential manner.

One of us will be contacting you by phone within the next few days to discuss the best way to gather information from teachers in your high school. We will also be seeking information about the number of teachers involved with HSTW reform in your school.

Thank you for considering our request.

Sincerely,

Norbert O. Aneke
Research Assistant
Career and Occupational Studies
Virginia Tech

Curtis R. Finch
Professor and Director
Virginia Tech Office
National Center for Research in
Vocational Education

Appendix B

Stages of Concern Questionnaire

112 Lane Hall
Virginia Tech
Blacksburg, VA 24061-0254

Local Pilot Site Coordinator

Dear Ms./Mr/Dr. ...:

Please find enclosed 25 sets of Concern Questionnaire and self addressed and stamped envelopes for easy return by teachers. As we discussed, each questionnaire will take about 15 minutes to complete and can be mailed directly to us, using the envelope provided.

The enclosed numbered-sheet is for easy listing of names of teachers completing the concern questionnaire. Each number corresponds to a code-number in one questionnaire. As each teacher receives a questionnaire, please record his/her name against the number in the sheet corresponding to the number in his/her questionnaire. This list should not be returned to us. The list will help us to track the return rate while maintaining anonymity of teachers' responses.

We appreciate your assistance in this study.

Sincerely,

Norbert O. Aneke
Research Assistant
Career and Occupational Studies

Curtis R. Finch
Professor and Director,
Virginia Tech Office, National Center
for Research in Vocational Education

112 Lane Hall
Virginia Tech
Blacksburg, VA 24061-0254

Xxx
X School
Y city, VA

Dear colleague:

We are seeking your assistance with a study focusing on the High Schools That Work reform in the Commonwealth of Virginia. The purpose of this study is to determine teachers' concerns about implementing the High Schools That Work reform.

You can help us by taking about 15 minutes of your time to complete the enclosed questionnaire. Please return the completed questionnaire in the enclosed self-addressed, stamped envelope by December 31, 1995. Your response is critical to the success of this study.

Note that all information you provide will remain confidential. No individual or school will be identified in the study. Each questionnaire has been coded so we can contact non-respondents. The enclosed pre-addressed, stamped envelope is for your direct mailing to us.

If you have any questions, please contact Norbert at 703-231- 8118 between 9.00 a.m. and 4.00 p.m. or at 703-951-5170 after 5 p.m. Many thanks in advance for your assistance.

Sincerely,

Norbert O. Aneke
Research Assistant
Career and Occupational Studies.

Curtis R. Finch
Professor and Director,
Virginia Tech Office,
National Center for Research in
Vocational Education.

CONCERN QUESTIONNAIRE

Your response to every item is crucial to this study. Please circle only one response per questionnaire item.

SECTION I: INSTRUCTIONS

The purpose of this questionnaire is to determine what people who are implementing, or thinking of implementing, educational programs or practices are concerned about at different times during the reform process. Some of the items on section one of this questionnaire may appear to be of little relevance or irrelevant to you at this time, please circle "0" on the scale against such items. Other items will represent those concerns you do have, in varying degrees of intensity, and should be marked higher on the scale.

For example:

	Irrelevant						Very true of me now
This statement is very true of me at this time	0	①	2	3	4	5	6 7
This statement is somewhat true of me now	0	1	2	②	4	5	6 7

Please respond to the items in terms of YOUR PRESENT CONCERNS or how you feel about your involvement or potential involvement with the High Schools That Work reform. We do not hold to any one definition of this reform now, so please think of it in terms of your own perception of what it involves. Please respond to each item in terms of your present concerns about your involvement or potential involvement with the High Schools That Work (HSTW) reform.

Please respond to the following statements as they relate to the High Schools That Work reform.

	0	1	2	3	4	5	6	7
Key:	Irrelevant	Not true of me now	Somewhat true of me now			Very true of me now		
1. I am concerned about students' attitudes towards HSTW reform. -----	0	1	2	3	4	5	6	7
2. I now know of some other approaches that might work better than HSTW reform -----	0	1	2	3	4	5	6	7
3. I don't even know what HSTW reform is-----	0	1	2	3	4	5	6	7
4. I am concerned about not having enough time to organize myself each day-----	0	1	2	3	4	5	6	7
5. I would like to help other faculty members in the use of HSTW.-----	0	1	2	3	4	5	6	7
6. I have a limited knowledge about HSTW reform.	0	1	2	3	4	5	6	7
7. I would like to know the effect of reorganization on my professional status-----	0	1	2	3	4	5	6	7
8. I am concerned about conflict between my interests and my responsibilities-----	0	1	2	3	4	5	6	7
9. I am concerned about revising my use of HSTW.	0	1	2	3	4	5	6	7
10. I would like to develop working relationships with both our faculty and outside faculty using HSTW.	0	1	2	3	4	5	6	7
11. I am concerned about how HSTW affects students.	0	1	2	3	4	5	6	7

	0	1	2	3	4	5	6	7
	Irrelevant	Not true of me now	Somewhat true of me now					Very true of me now
12. I am not concerned about HSTW reform.-----	0	1	2	3	4	5	6	7
13. I would like to know who will make the decisions in the new HSTW reform.-----	0	1	2	3	4	5	6	7
14. I would like to discuss the possibility of using the HSTW reform.-----	0	1	2	3	4	5	6	7
15. I would like to know what resources are available if we decide to adopt HSTW reform.-----	0	1	2	3	4	5	6	7
16. I am concerned about my inability to manage all that HSTW reform requires.-----	0	1	2	3	4	5	6	7
17. I would like to know how my teaching is supposed to change.-----	0	1	2	3	4	5	6	7
18. I would like to familiarize other departments or persons with the progress of this new approach.--	0	1	2	3	4	5	6	7
19. I am concerned about evaluating my impact on students.-----	0	1	2	3	4	5	6	7
20. I would like to revise the HSTW's instructional approach.-----	0	1	2	3	4	5	6	7
21. I am completely occupied with other things.-----	0	1	2	3	4	5	6	7
22. I would like to modify our use of the HSTW reform based on the experiences of our students.	0	1	2	3	4	5	6	7
23. Although I don't know about HSTW reform, I am concerned about things in the area.-----	0	1	2	3	4	5	6	7
24. I would like to excite students about their part in this approach .-----	0	1	2	3	4	5	6	7
25. I am concerned about time spent working with nonacademic problems related to HSTW reform.	0	1	2	3	4	5	6	7
26. I would like to know what the use of HSTW reform will require in the immediate future.---	0	1	2	3	4	5	6	7
27. I would like to coordinate my effort with others to maximize the HSTW effects.-----	0	1	2	3	4	5	6	7
28. I would like to have more information on time and energy commitments required by HSTW.--	0	1	2	3	4	5	6	7

	0	1	2	3	4	5	6	7			
	Irrelevant	Not true of me now	Somewhat true of me now			Very true of me now					
29. I would like to know what other faculty are doing in this area.-----				0	1	2	3	4	5	6	7
30. At this time, I am not interested in learning about HSTW reform.-----				0	1	2	3	4	5	6	7
31. I would like to determine how to supplement, enhance, or replace HSTW reform.-----				0	1	2	3	4	5	6	7
32. I would like to use feedback from students to change the HSTW program.-----				0	1	2	3	4	5	6	7
33. I would like to know how my role will change when I am using HSTW reform.-----				0	1	2	3	4	5	6	7
34. Coordination of tasks and people is taking too much of my time.-----				0	1	2	3	4	5	6	7
35. I would like to know how HSTW is better than what we have now.-----				0	1	2	3	4	5	6	7

SECTION II: INSTRUCTION

For each question you will find a set of scales. You are to circle one appropriate rating for each question.

Key: No, Never—NN. No, Almost Never—NAN. Usually Not, Infrequently—UNL. Sometimes, Yes and No—SYN. Usually Yes, Frequently—UYF. Yes, Almost Always—YAA. Yes, Always—YA.

	No, Never NN	NAN	UNI	SYN	UYF	YAA	Yes, Always YA
36. Is your general disposition toward new ideas and programs one of open-minded optimism?-----	1	2	3	4	5	6	7
37. Are you willing to try something new--something that will require extra initial effort on your part?-----	1	2	3	4	5	6	7
38. Are you willing to try something new even if it may fail? (Your answer should not apply to fragmented or poorly planned and structured ideas and programs)-----	1	2	3	4	5	6	7
39. Does your selection of innovations reflect careful thought about the overall needs and priorities of your situation?--	1	2	3	4	5	6	7
40. When an educational innovation is considered, do you develop a strategy or plan of action for bringing about its successful implementation?-----	1	2	3	4	5	6	7
41. Do you feel that you have sufficient freedom to initiate new programs and/or ideas?-----	1	2	3	4	5	6	7

	No, Never						Yes, Always	
	NN	NAN	UNI	SYN	UYF	YAA	YA	
42. Do you exercise persistence and diplomacy in sticking with an innovation you would like to try, believing "powers that be" can be brought around from what may be an initial coolness?	1	2	3	4	5	6	7	
43. Are you willing to have your innovation brought under careful scrutiny by your colleagues and others with inherent possibilities of conflicting points of view -personal as well as professional?	1	2	3	4	5	6	7	
44. Do you make a special effort to read about innovations and changes in your field?-----	1	2	3	4	5	6	7	
45. Do you take the initiative in contacting other school systems that are trying an idea or program that is of interest to you?	1	2	3	4	5	6	7	
46. Do you bring new ideas and developments to the attention of colleagues as well as appropriate administrative personnel?-	1	2	3	4	5	6	7	
47. Are you willing to ask yourself "why" about your teaching methods and the materials used?-----	1	2	3	4	5	6	7	
48. Do you feel that your principal encourages you to innovate and try new ideas and programs?-----	1	2	3	4	5	6	7	
49. Do you feel that your superintendent and central office encourages you to innovate and try new ideas and programs?	1	2	3	4	5	6	7	
50. Do you take time to consider and seek to gain greater insight into the processes of educational change?-----	1	2	3	4	5	6	7	
51. Do coffee hour or informal conversations include new ideas and developments in curriculum and instruction?-----	1	2	3	4	5	6	7	
52. Are you aware (in terms of knowing some details) of the growing importance of research, experimentation, and innovation in American education?-----	1	2	3	4	5	6	7	

SECTION III: BIOGRAPHICAL INFORMATION

1. Please check the response that best describes the subjects you teach. Academic 1 Vocational 2
2. How many months have you personally been involved with the HSTW reform? months
3. How much HSTW reform training have you received? Hours
4. What is the **highest** formal education you completed: (Check one) **i.** Less than Associate **ii.** Associate
iii. BA/BS **iv.** Masters **v.** Masters Plus at Least 30 hrs. **vi.** Doctoral Degree

Thank you for taking time to complete this task. Please return in the self addressed envelope to:
 Norbert O. Aneke, 112 Lane Hall, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061-0254.

Appendix C

Cover Letter to Local Pilot Site Coordinator for Postcard Distribution

112 Lane Hall
Virginia Tech
Blacksburg, VA 24061-0254

Local Pilot Site Coordinator

Dear Ms./Mr./Dr.:

Thank you for your assistance so far in the research on teachers' concern about the HSTW reform. We have already received several completed responses from your teachers.

These postcards serve to express our sincere thanks to those teachers who completed and returned theirs. They also serve to remind those who may not have had time to respond on schedule to complete and return their responses.

To maintain confidentiality, we do not know which teachers responded. We also believe that you do not know which teachers responded and in particular, their responses. We have, therefore, addressed the postcard to express our thanks to those who responded, and at the same time, to serve as a reminder to those who are yet to respond. Every teacher who received the questionnaire should also receive a postcard, irrespective of her/his response status.

Your continued contribution to the success of this study is appreciated.

Sincerely,

N. O. Aneke

C. R. Finch

Dear Colleague:

During the second week of December, 1995, questionnaires focusing on teachers' concerns about the High Schools That Work reform were mailed to the HSTW coordinator for you to complete. Because this study targets those already using the reform, your response is extremely important.

Please accept our sincere thanks, if you have already completed and returned the questionnaire. If not, please do so today. Your response is a significant input to the continuous improvement process of the reform.

If by chance you did not receive the questionnaire, or it got misplaced, please call Norbert for a replacement at (540) 231-8118 between 9 and 4 p. m. or (540) 951-5170 after 5 p. m.

Thank you.

N. O. Aneke

C. R. Finch

Dear Colleague:

During the second week of December, 1995, questionnaires focusing on teachers' concerns about the High Schools That Work reform were mailed to the HSTW coordinator for you to complete. Because this study targets those already using the reform, your response is extremely important.

Please accept our sincere thanks, if you have already completed and returned the questionnaire. If not, please do so today. Your response is a significant input to the continuous improvement process of the reform.

If by chance you did not receive the questionnaire, or it got misplaced, please call Norbert for a replacement at (540) 231-8118 between 9 and 4 p. m. or (540) 951-5170 after 5 p. m.

Thank you.

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VITA

Norbert Ogbonna Aneke passed the intermediate level of the City and Guilds (C&G) of London in 1973 and the final level in 1974. He earned the Full Technological Certificate of the C&G of London in 1975. Norbert completed the Nigerian Technical Teachers' Certificate from the Institute of Management and Technology, Enugu, Nigeria in 1979. He then proceeded to Bowling Green State University (BGSU), Ohio, where he completed his B. Sc. in Industrial Education in 1984, and his M. Ed. in Career and Technology Education in 1985. Norbert earned his Ph. D. in Vocational and Technical Education from Virginia Polytechnic Institute and State University in 1996.

Norbert's career began at Kanbros Engineering Co. Ltd. Enugu, Nigeria, where, as a Technical Officer, he led a work group who designed, planned, and executed domestic, commercial, and industrial electrical projects for two years. He then joined the Enugu State Education Commission where he taught electrical/electronics courses at Government Technical College (GTC), Abakaliki, Nigeria for two years. He also taught mathematics and electrical/electronics courses at GTC Nsukka, Nigeria for three years. At BGSU, Norbert participated in developing and implementing various training programs. After completing his studies at BGSU, he served as the Vice Principal, GTC, Nsukka for three years before joining the Enugu State University of Science and Technology (ESUT), Nigeria.

At ESUT, Norbert was a Lecturer I in the Department of Science and Technical Education. He coordinated all academic and administrative activities and taught electrical- electronics courses as well as occupational analysis and training and development courses within the department. Norbert is affiliated with professional and honorary organizations such as the National Association of Teachers of Technology, Nigeria, Nigerian Vocational Association, Technological Writers Association of Nigeria, American Vocational Association, Epsilon Pi Tau, and Omicron Tau Theta. He has published journal articles, presented papers at professional conferences, and assisted in two National Center for Research in Vocational Education projects while working on his Ph. D. at Virginia Polytechnic Institute and State University.



Norbert Ogbonna Aneke