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ABSTRACT

Some school reform programs, such as the "Copernican Plan," advocate long blocks of classroom instruction time to allow greater instructional flexibility and active student participation in classroom work. This study investigated the effectiveness of this strategy by examining the perceptions of high school teachers who were entering or who had been working under extended time schedules (ETS). Data were collected through surveys and interviews with teachers at four Pennsylvania high schools: schools A and B, which were about to implement ETS, and schools C and D, which were in their first year of ETS implementation. A total of 90 teachers from schools A and B and 39 teachers from schools C and D participated. Findings included the following: (1) at all schools teachers thought that ETS allowed time to develop and include more new activities in the classroom; (2) discipline problems and waning student motivation during long blocks of time were also cited as problematic; (3) teachers from all schools reported using more cooperative activities; and (4) although teachers from the schools planning to implement ETS expected to increase their preparation time, teachers from the school in their first year of ETS reported no increase in preparation time. Overall teachers saw some advantages to ETS but found that less able students might experience problems under ETS. (Contains 11 references.) (JB)

Teacher Perceptions of Extended Time Scheduling in Four High Schools

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Introduction

Extended time scheduling or "macro scheduling" is the process of creating longer instructional blocks, e.g., 2 hours or 90 minutes as opposed to the traditional 45 minute periods, based on the premise that the longer blocks of time will promote team work, place the teacher in the role of facilitator as opposed to lecturer, allow flexibility for use in instructional methodology, and create a less pressured classroom environment. As a result of these changes, student achievement will increase (Carroll, 1990; Sizer, 1992).

In a series of case studies reported by Carroll (1994), extended time scheduling is consistently reported to increase student academic performance while lowering the dropout rate of students. Additional reported benefits of extended time scheduling include increases in mastery of content and decreases in discipline problems.

The body of research on extended time scheduling is mainly comprised of case studies and qualitative investigations of student and teacher perceptions of extended time scheduling. Few quantitative studies exist which look specifically at instructional changes created by extended time scheduling which may be influence student achievement, discipline, absenteeism, and mastery of content. This study investigates teacher perceptions of five changes in instructional behavior which appear to accompany the implementation of extensive time scheduling. The five changes, incorporation of new instructional activities, use of cooperative learning strategies, changes in assessment strategies for measuring student progress, increases in teacher preparation time for classes, and increased use of library materials and services, were identified in previous studies (Adams & DiRocco, 1994; Hart, 1994) as instructional areas that are affected by the implementation of extended time schedules. In addition to changes in instructional strategies, the ability of teachers to accommodate the needs of two groups of students, students who transfer into the school district from another school district and students with special needs as identified in an individualized educational plan (IEP), were also investigated. Teacher perceptions of changes in instructional strategies and the ability of teachers to accommodate special student groups were analyzed with respect to teacher gender, subject area taught, and years of teaching experience.

Background

Sizer's (1992) study of high schools identified two major features of United States public high schools: a curriculum that is overloaded and students who are "unengaged" in the learning process. The teacher, according to Sizer, is seen as "donor" and the student as "receiver" of knowledge. Past research has shown that classrooms which actively engage the learner, as opposed to classrooms where the role of the student is a passive receiver of information, are more successful in promoting academic achievement (Slavin, 1990). Investigations of student engagement have identified specific teaching strategies which create learning situations where students are actively involved in the learning process. Teaching strategies identified as being most effective in actively engaging the student are cooperative learning (Slavin, 1990), integrated curriculum, (Jacobs, 1989), and attention to different learning styles (Dunn & Dunn, 1979). While some researchers believed that these instructional methods increased student learning, other researchers identified a related variable, increased class time, as critical to maximizing the success of those methods. Teachers needed more class time to use cooperative groups, vary instruction to accommodate diversity in learning styles, and develop interdisciplinary lessons.

J. M. Carroll's (1990) plan or "Copernican Plan" for restructuring schools forms the theoretical framework for extended time scheduling. The Copernican Plan offers an alternative to the traditional high school schedule of six to eight 45 minute classes from September to June. It proposes trimester or semester courses similar to the college schedule, using longer blocks of time for two, three, or four courses each semester. Reports from restructured high schools using the Copernican Plan or a variation of it indicate favorable results: overall grade point average is up, failures are significantly down, learning has replaced memorizing, and students experience less stress (Carroll, 1994).

Recognizing time as the most important variable, the Copernican Plan provides a structure which encourages the use of longer blocks of time while decreasing the number of class preparations and student contacts, therefore allowing teachers "to concentrate virtually all of their time on teaching strategies for one subject and on getting to know and understand individual students, how each learns best and is motivated." (Carroll, 1989, p. 44) Extending this basic premise embodied in the Copernican plan, focusing on

fewer classes should promote teacher development and implementation of new instructional strategies while enhancing the opportunity of teachers to meet the specific learning needs of individual students. The investigation of this premise and its extension is the focus of this study.

Method and Data Source

Data for this study was collected from four high schools in central and eastern Pennsylvania. When this study began, two high schools, Schools A and B, were about to enter into an extended time schedule [ETS]. Surveys were administered to the teachers in these two schools in order to analyze their pre-implementation perceptions of ETS. The surveys investigated teachers' perceptions of how ETS would affect five areas of teacher instructional behavior: the incorporation of new instructional activities in classes, use of cooperative learning strategies, use of library materials and services, changes in student assessment procedures, and changes in teacher preparation time. In addition to the five areas of instructional behavior the survey also gathered teacher perceptions regarding the effects of ETS on meeting the needs of two special groups of students: students with special needs as identified in an IEP and students who transfer into the school district during the school year.

A total of 90 teachers from Schools A and B completed and returned the surveys. Data from this sample were analyzed using two way analyses of variance (ANOVA). Specific interactions that were investigated were gender with years of teaching experience, gender with subject area taught, and years of teaching experience with subject taught. Each of the independent variables was divided into two factors: gender (male, female), years of teaching experience (less than 15 years experience, 15 or more years experience), and subject area (quantitative subjects, non quantitative subjects). Less than 15 years experience and more than 15 years experience were selected as the two factors for teaching experience because they represented an approximate median split of the sample by years of experience. Subject area taught was divided into quantitative and non quantitative factors because of the differences associated with analytical and synthetic disciplines (Welton & Mallan, 1992). Analytic disciplines, which correspond to our label of quantitative, are those disciplines which rest on abstract rules and constructs and often have predetermined right answers to problems posed to students. Synthetic disciplines, which correspond to our label of non quantitative, are

those disciplines which are based on phenomena that have been observed in the real world and present problems where answers cannot be determined in advance but are based on observed phenomena. Quantitative subjects in this study included the disciplines of math and science while non quantitative subjects included the humanities and social science disciplines.

When this study began the other two high schools, Schools C and D, were in their first year of implementing ETS. The same survey used in Schools A and B was administered to the teachers in these two schools. A total of 39 teachers from Schools C and D completed and returned the surveys. Because of the small number of teachers in this sample, only summary data in the form of means were computed for each of the areas of investigation. Means from Schools C and D were compared with the results of the analyses from Schools A and B for the purpose of identifying continuing patterns or changes in patterns in pre implementation and post implementation schools.

Following the collection and analysis of the survey data, interviews were conducted with teachers in each of the four schools. Interview questions were designed to probe differences that were found in the survey data. Interviews conducted in all four schools were conducted during or immediately after the first year of implementation. Additional surveys designed to probe the advantages/disadvantages and stressors teachers were experiencing in ETS were distributed to all four schools following the structured interviews. These interviews and surveys allowed the researchers to identify post implementation trends and concerns of teachers in the four school sample of ETS schools.

Results

Analyses of the pre implementation data from Schools A and B showed no significant differences in the way different groups viewed how ETS affected the incorporation of new activities in the classroom. However, mean scores suggest that teachers perceive ETS to positively affect the incorporation of new activities, with less experienced teachers more strongly agreeing that ETS will provide teachers with the opportunity to incorporate new activities in their instruction (Table 1). Means from Schools C and D indicate that teachers' post implementation experiences are less positive about the effect of ETS in encouraging the incorporation of new activities, with no evident pattern between more experienced and less experienced teachers (Table 2).

Table 1

Mean Scores for Incorporation of New Activities in Schools A and B[a]

	M	SD
Gender/Experience		
Male/less than 15 yrs.	4.07	.62
Male/more than 15 yrs.	3.89	.91
Female/less than 15 yrs.	4.33	.66
Female/more than 15 yrs.	3.92	1.00
Gender/Subject taught		
Male/Quant	3.64	1.09
Male/Non Quant	4.04	.69
Female/Quant	4.09	.83
Female/Non Quant	4.12	.91
Subject taught/Experience		
Quant/Less than 15 yrs.	3.92	.76
Quant/More than 15 yrs.	3.91	1.14
Non Quant/Less than 15 yrs.	4.41	.50
Non Quant/More than 15 yrs.	3.90	.91

Note. Mean scores reflect scores on a 5 pt. scale (1=strongly disagree, 5=strongly agree).

[a]n=87

Table 2

Mean Scores for Incorporation of New Activities in Schools C and D[a]

	M	SD
Gender/Experience		
Male/less than 15 yrs.	4.00	.81
Male/more than 15 yrs.	3.70	.82
Female/less than 15 yrs.	3.50	1.08
Female/more than 15 yrs.	3.20	1.62
Gender/Subject taught		
Male/Quant	4.00	.63
Male/Non Quant	3.73	.91
Female/Quant	3.71	.95
Female/Non Quant	3.33	1.44
Subject taught/Experience		
Quant/Less than 15 yrs.	3.75	.89
Quant/More than 15 yrs.	4.00	.71
Non Quant/Less than 15 yrs.	4.00	.54
Non Quant/More than 15 yrs.	3.27	1.39

Note. Mean scores reflect scores on a 5 pt. scale (1=strongly disagree, 5=strongly agree).

[a]n=36

Analyses of data from Schools A and B also showed no significant differences between groups in the incorporation of cooperative learning activities in classroom instruction. Mean scores, however, show that teachers in all groups perceive ETS to increase their use of cooperative grouping activities in classroom instruction (Table 3). Mean scores from Schools C and D show teachers in all groups experienced greater use of cooperative learning activities within their classrooms (Table 4). These mean scores also indicate

that teachers of quantitative subjects experienced the greatest increase in use of cooperative learning activities.

Table 3

Mean Scores for Use of Cooperative Learning Strategies in Schools A and B[a]

	M	SD
Gender/Experience		
Male/less than 15 yrs.	4.14	.54
Male/more than 15 yrs.	4.12	.78
Female/less than 15 yrs.	4.24	.83
Female/more than 15 yrs.	4.25	.68
Gender/Subject taught		
Male/Quant	4.21	.70
Male/Non Quant	4.36	.81
Female/Quant	4.11	.70
Female/Non Quant	4.24	.71
Subject taught/Experience		
Quant/Less than 15 yrs.	4.23	.73
Quant/More than 15 yrs.	4.27	.79
Non Quant/Less than 15 yrs.	4.18	.73
Non Quant/More than 15 yrs.	4.19	.70

Note. Mean scores reflect scores on a 5 pt. scale (1=strongly disagree, 5=strongly agree).

[a]n=87

Table 4

Mean Scores for Use of Cooperative Learning Activities in Schools C and D[a]

	M	SD
Gender/Experience		
Male/less than 15 yrs.	4.29	.76
Male/more than 15 yrs.	4.18	.75
Female/less than 15 yrs.	4.22	.67
Female/more than 15 yrs.	4.20	.79
Gender/Subject taught		
Male/Quant	4.50	55
Male/Non Quant	4.08	.79
Female/Quant	4.43	.54
Female/Non Quant	4.08	.79
Subject taught/Experience		
Quant/Less than 15 yrs.	4.50	.54
Quant/More than 15 yrs.	4.40	.55
Non Quant/Less than 15 yrs.	4.00	.76
Non Quant/More than 15 yrs.	4.13	.81

Note. Mean scores reflect scores on a 5 pt. scale (1=strongly disagree, 5=strongly agree).

[a]n=37

Although no significant differences were found for the incorporation of new activities, significant differences were found in two other areas related to instructional changes in the classroom, increased use of library materials and services and changes in the way students are assessed. Main effects were found for both gender ($p<.05$) and subject area ($p<.05$) with respect to increased use of library services and materials. Male teachers (Table 5) and teachers of

non quantitative subjects (Table 6) in Schools A and B reported that their use of library materials and services would be significantly greater than females and quantitative teachers respectively. Mean scores, however, indicate that all teachers do perceive that use of library materials and services will increase under ETS. Mean scores from Schools C and D (Table 7) also indicate that teachers are experiencing a slight increase in the use of library materials and services, with non quantitative teachers experiencing the greatest increase. No differences, however, appear to exist between male and female teachers.

Table 5

ANOVA for Gender and Years Experience on Increased Use of Library Materials and Services

Source	df	MS	F
Gender (G)	1	3.63	5.69*
Years Experience (E)	1	.01	.01
GxE	1	.12	.19
S within-group error	79	(.64)	

Value enclosed in parentheses represents mean square error. S = subjects

*p < .05

Table 6

ANOVA for Gender and Subject Area Taught on Increased Use of Library Materials and Services

Source	df	MS	F
Gender (G)	1	1.67	2.94
Subject Area Taught (T)	1	2.91	5.12*
GxT	1	.69	1.22
S within-group error	80	(.57)	

Value enclosed in parentheses represents mean square error. S = subjects

*p < .05

Table 7

Mean Scores for Increased Use of Library Materials and Services in Schools C and D[a]

	M	SD
Gender/Experience		
Male/less than 15 yrs.	3.29	.49
Male/more than 15 yrs.	3.27	.47
Female/less than 15 yrs.	3.30	1.06
Female/more than 15 yrs.	3.40	.84
Gender/Subject taught		
Male/Quant	3.17	.41
Male/Non Quant	3.33	.49
Female/Quant	3.29	49
Female/Non Quant	3.58	.90
Subject taught/Experience		
Quant/Less than 15 yrs.	3.13	.35
Quant/More than 15 yrs.	3.40	.55
Non Quant/Less than 15 yrs.	3.75	.71
Non Quant/More than 15 yrs.	3.31	.70

Note. Mean scores reflect scores on a 5 pt. scale (1=strongly disagree, 5=strongly agree).

[a]n=37

With respect to changes in student assessment, a significant interaction effect was found with respect to gender and years experience in Schools A and B ($p<.05$). Although all teachers expressed that they would change the way they assess students, female teachers with greater experience and male teachers with less experience perceived they would more likely change their assessment strategies than male teachers with greater experience (Table 8). Data collected from Schools C and D also indicated that teachers incorporated

different assessment strategies, however, mean scores do not reflect differences in gender and experience (Table 9).

Table 8

ANOVA for Gender and Years Experience on Changes in Student Assessment

Source	df	MS	F
Gender (G)	1	.38	.73
Years Experience (E)	1	.18	.36
GxE	1	2.16	4.17*
S within-group error	82	(.52)	

Value enclosed in parentheses represents mean square error. S = subjects

*$p < .05$

Table 9

Mean Scores for Changes in Student Assessment in Schools C and D[a]

	M	SD
Gender/Experience		
Male/less than 15 yrs.	3.71	.49
Male/more than 15 yrs.	3.70	.68
Female/less than 15 yrs.	4.00	.00
Female/more than 15 yrs.	3.70	1.06
Gender/Subject taught		
Male/Quant	3.83	.41
Male/Non Quant	3.64	.67
Female/Quant	4.14	.38
Female/Non Quant	3.67	.89
Subject taught/Experience		
Quant/Less than 15 yrs.	4.00	.00
Quant/More than 15 yrs.	4.00	.71
Non Quant/Less than 15 yrs.	3.75	.46
Non Quant/More than 15 yrs.	3.60	.91

Note. Mean scores reflect scores on a 5 pt. scale (1=strongly disagree, 5=strongly agree).

[a]n=37

No significant differences were found with respect to the amount of preparation time teachers felt they would need to expend in ETS, however, mean scores of teachers in Schools A and B indicated that teachers perceived ETS would require more preparation time (Table 10). Mean scores of teachers in Schools C and D differ from those in Schools A and B with teachers in Schools C and D indicating that teachers did not experience a greater amount of lesson preparation time under ETS (Table 11).

Table 10

Mean Scores for Increased Teacher Preparation Time in Schools A and B[a]

	M	SD
Gender/Experience		
Male/less than 15 yrs.	4.21	1.12
Male/more than 15 yrs.	3.69	1.23
Female/less than 15 yrs.	3.46	1.37
Female/more than 15 yrs.	3.56	1.45
Gender/Subject taught		
Male/Quant	3.71	1.49
Male/Non Quant	3.96	1.00
Female/Quant	3.64	1.21
Female/Non Quant	3.51	1.46
Subject taught/Experience		
Quant/Less than 15 yrs.	3.69	1.18
Quant/More than 15 yrs.	3.64	1.63
Non Quant/Less than 15 yrs.	3.78	1.41
Non Quant/More than 15 yrs.	3.67	1.24

Note. Mean scores reflect scores on a 5 pt. scale (1=strongly disagree, 5=strongly agree).

[a]n=85

Table 11

Mean Scores for Increased Teacher Preparation Time in Schools C and D[a]

	M	SD
Gender/Experience		
Male/less than 15 yrs.	2.42	.79
Male/more than 15 yrs.	2.00	1.18
Female/less than 15 yrs.	1.89	.60
Female/more than 15 yrs.	1.90	1.10
Gender/Subject taught		
Male/Quant	1.83	.75
Male/Non Quant	2.33	1.16
Female/Quant	1.86	.69
Female/Non Quant	1.92	1.00
Subject taught/Experience		
Quant/Less than 15 yrs.	2.00	.76
Quant/More than 15 yrs.	1.60	.55
Non Quant/Less than 15 yrs.	2.25	.71
Non Quant/More than 15 yrs.	2.06	1.24

Note. Mean scores reflect scores on a 5 pt. scale (1=strongly disagree, 5=strongly agree).

[a]n=37

Of the two areas related to meeting the needs of students, i.e., special needs students and transfer students, significant differences were found only for meeting the needs of special needs students. In Schools A and B a significant interaction effect ($p<.05$) was found for gender and years of teaching experience. Males with more than 15 years of teaching experience and females with less than 15 years of teaching experience perceived that ETS would enable them to more adequately meet the needs of special needs students than do males with less than 15 years of teaching experience (Table 12). All groups, with the exception of males with less than 15 years of experience,

perceived that ETS would help teachers better meet the needs of special needs students. Means from Schools C and D also showed that teachers experienced increased opportunities to assist special needs students, however, females with more than 15 years of experience indicated that there was little difference in their ability to meet the needs of special needs students under ETS (Table 13).

Table 12

ANOVA for Gender and Years Experience on Increased Opportunities to Assist Special Needs Students

Source	df	MS	F
Gender (G)	1	1.84	2.28
Years Experience (E)	1	.18	.23
G x E	1	3.55	4.42*
S within-group error	80	(.81)	

Value enclosed in parentheses represents mean square error. S = subjects

*p < .05

Table 13

Mean Scores for Increased Opportunities to Assist Special Needs Students in Schools C and D[a]

	M	SD
Gender/Experience		
Male/less than 15 yrs.	3.71	.95
Male/more than 15 yrs.	3.64	1.12
Female/less than 15 yrs.	3.89	.78
Female/more than 15 yrs.	3.10	1.52
Gender/Subject taught		
Male/Quant	4.33	.52
Male/Non Quant	3.33	1.07
Female/Quant	3.43	1.27
Female/Non Quant	3.50	1.31
Subject taught/Experience		
Quant/Less than 15 yrs.	4.00	.76
Quant/More than 15 yrs.	3.60	1.52
Non Quant/Less than 15 yrs.	3.63	.92
Non Quant/More than 15 yrs.	3.31	1.30

Note. Mean scores reflect scores on a 5 pt. scale (1=strongly disagree, 5=strongly agree).

[a]n=37

Although no significant differences were found between groups with respect to accommodating transfer students. mean scores of all groups in Schools A and B indicated that accommodating students who transferred from a non ETS school to an ETS school would be difficult (Table 14). Mean scores from Schools C and D indicated that male teachers of non quantitative subjects experienced the greatest difficulties in accommodating transfer students (Table 15) with the other groups experiencing no more difficulty in

accommodating transfer students then they would have had under a non ETS system.

Table 14

Mean Scores for Meeting the Needs of Transfer Students in Schools A and B[a]

	M	SD
Gender/Experience		
Male/less than 15 yrs.	2.36	.93
Male/more than 15 yrs.	2.38	.77
Female/less than 15 yrs.	2.67	.80
Female/more than 15 yrs.	2.20	.71
Gender/Subject taught		
Male/Quant	2.29	.73
Male/Non Quant	2.27	.79
Female/Quant	2.39	.90
Female/Non Quant	2.47	.79
Subject taught/Experience		
Quant/Less than 15 yrs.	2.39	.87
Quant/More than 15 yrs.	2.27	.47
Non Quant/Less than 15 yrs.	2.64	.85
Non Quant/More than 15 yrs.	2.30	.81

Note. Mean scores reflect scores on a 5 pt. scale (1=strongly disagree, 5=strongly agree).

[a]n=83

Table 15

Mean Scores for Meeting the Needs of Transfer Students in Schools C and D[a]

	M	SD
Gender/Experience		
Male/less than 15 yrs.	2.29	.76
Male/more than 15 yrs.	2.55	.82
Female/less than 15 yrs.	3.00	.54
Female/more than 15 yrs.	3.00	.71
Gender/Subject taught		
Male/Quant	3.00	.63
Male/Non Quant	2.17	.72
Female/Quant	2.83	.75
Female/Non Quant	3.09	.54
Subject taught/Experience		
Quant/Less than 15 yrs.	2.86	.69
Quant/More than 15 yrs.	3.00	.71
Non Quant/Less than 15 yrs.	2.50	.76
Non Quant/More than 15 yrs.	2.67	.82

Note. Mean scores reflect scores on a 5 pt. scale (1=strongly disagree, 5=strongly agree).

[a]n=35

A final question asked teachers' overall opinion of ETS. Although no significant differences were found between groups, mean scores indicate that teachers in Schools A and B perceived that ETS was a positive change (Table 16). Mean scores from Schools C and D also indicated that teachers had positive experiences under ETS (Table 17).

Table 16

Mean Scores for Overall Opinion of ETS in Schools A and B[a]

	M	SD
Gender/Experience		
Male/less than 15 yrs.	4.00	.68
Male/more than 15 yrs.	4.08	.88
Female/less than 15 yrs.	4.46	.60
Female/more than 15 yrs.	3.96	.86
Gender/Subject taught		
Male/Quant	3.86	.77
Male/Non Quant	4.27	.65
Female/Quant	4.15	.78
Female/Non Quant	4.18	.83
Subject taught/Experience		
Quant/Less than 15 yrs.	4.15	.80
Quant/More than 15 yrs.	3.91	.70
Non Quant/Less than 15 yrs.	4.35	.57
Non Quant/More than 15 yrs.	4.06	.92

Note. Mean scores reflect scores on a 5 pt. scale (1=strongly disagree, 5=strongly agree).

[a]n=83

Table 17

Mean Scores for Overall Opinion of ETS in Schools C and D[a]

	M	SD
Gender/Experience		
Male/less than 15 yrs.	4.29	.48
Male/more than 15 yrs.	4.09	.94
Female/less than 15 yrs.	4.30	.48
Female/more than 15 yrs.	4.20	.92
Gender/Subject taught		
Male/Quant	4.50	.55
Male/Non Quant	4.00	.85
Female/Quant	4.29	.49
Female/Non Quant	4.25	.87
Subject taught/Experience		
Quant/Less than 15 yrs.	4.38	.52
Quant/More than 15 yrs.	4.40	.55
Non Quant/Less than 15 yrs.	4.25	.46
Non Quant/More than 15 yrs.	4.06	1.00

Note. Mean scores reflect scores on a 5 pt. scale (1=strongly disagree, 5=strongly agree).

[a]n=37

Discussion

In both the pre observation and post observation schools, teachers expressed that ETS enhanced their ability to develop and include new activities in the classroom. The following quotes gathered from post implementation surveys and interviews support the quantitative data regarding development and inclusion of new activities.

> I can do more projects, cooperative learning, etc. [There is] more time for cross curricular work.

> I've had a chance to add some new materials. [I've] had time for re-working problem areas.
>
> We now have a chance for longer activities.
>
> We have the ability to do several activities daily without having to limit them due to time restrictions.
>
> There is more time for discussion, planning, and implementing assignments/projects.

The above quotes represent comments from both male and female teachers, quantitative and non quantitative teachers, and teachers with varying years of experience. However, support for the inclusion of new activities was not universal. Teachers expressed the following frustrations.

> I often end up "filling time," "wasting time," or "marking time."
>
> A class with poor conduct is long and difficult.
>
> Staying on task is difficult for students in the longer blocks of time.
>
> The freshmen become exhausted and angry from too much repetition or too much new material in one class. They become discouraged at the amount of discipline or punishment. They are honestly too immature to handle the long classes.
>
> It is difficult to remain concentrated on one subject for 90 minutes. ETS is tiresome even for students who work hard and are interested in the subject matter.

Although the longer periods of instructional time created by ETS appear to offer opportunities for developing and including new instructional activities, questions appear to be raised which may limit this opportunity. Discipline problems, waning student motivation created by the longer blocks of time, and the filling of class time with activities of little or limited value are variables which may negate the positive effects of including new learning activities in the instructional program.

As reported by Carroll (1994), schools that implement ETS often see an increase in the use of cooperative learning activities. The greater use of cooperative learning activities by quantitative teachers in schools C and D probably reflects the limited use of these activities in pre ETS teaching. Data collected from all four schools in post implementation interviews indicated that teachers are using more cooperative learning strategies. The following

comments reflect the increase of cooperative learning activities in the classroom.

> I am able to do more thorough group work.
>
> ETS allows the lesson/skill to be taught and leaves time for students to practice the skill in groups. ETS and cooperative groups allow for immediate feedback.
>
> I use the strategy of working in pairs; ETS provides the time frame for such a technique.
>
> There is more time to do group work.
>
> Students can work on more cooperative learning activities that promote socialization skills.

Although a majority of the teachers reported using increased numbers of cooperative group activities, future investigations should investigate the effects of these activities. Are these activities promoting learning or are they indeed simply activities designed to "fill time" in class?

Overall teachers perceived they would be using increased library materials and services under ETS. The significant difference between quantitative and non quantitative teachers showing non quantitative teachers' perception of using increased library resources reflects the social science and humanities orientation toward accessing outside materials and readings for the purpose of developing reports and presentations. Upon discussing this difference with the librarians of the four schools, they generally concurred; however, two of the librarians specifically identified a noticeable increase in the use of the library by math and science classes, particularly for the investigation of topics by individual students. Two of the librarians also identified another pattern, an increase in the requests of materials not available in the school library. These two librarians identified an increased workload in obtaining materials through interlibrary loan. The interviews and later open ended survey shed no light on why male teachers in Schools A and B perceived greater use of library materials and services. If gender differences do exist, however, these differences need to be recognized when providing teacher training in the availability and use of library resources prior to implementation of ETS. An investigation of library services as an

integral part of ETS implementation may assist future schools in the effective implementation of ETS.

Although all groups in Schools A and B perceived ETS to encourage the use of new types of assessments, female teachers with greater experience and male teachers with less experience perceived they would alter their student assessment strategies more than male teachers with greater experience. Less experienced male teachers, due to the recency of their training, may have been exposed to more demonstration-type assessment procedures and also the current concept of portfolio assessment. Therefore teachers with more recent training may have greater confidence not only in the effectiveness of the new assessment techniques but in their abilities to implement an assessment strategy based on techniques other than paper and pencil testing. Female teachers' greater openness to using new assessments may be due to female teachers' ethic of care (Gilligan, 1982) which is illustrated by the individual attention provided to students when using demonstration-based or portfolio assessments. Experienced male teachers may be more reluctant to use assessments which require a more intimate student relationship.

Although all groups of teachers perceived ETS to provide the opportunity to include different types of assessments due to the longer time blocks, many teachers discuss an increase in the number of concepts they are teaching daily. Because of the larger number of concepts forced into a shorter period of time, teachers discuss the increasing frequency of tests. Instead of a test every seven or eight days, teachers report giving quizzes and exams every three or four days so that the number of concepts being evaluated is not overwhelming to students. The cramming of more concepts into a shorter period of time may force teachers to use an efficient familiar assessment format such as an written exam with objective questions as opposed to more time-consuming alternatives such as demonstration-based or portfolio assessments. The question of opportunity for alternative assessments versus actual use of alternative assessments under ETS is an area that requires further study.

Teachers in Schools A and B projected that ETS would probably cause an increase in their preparation time. In Schools C and D during the first year of implementation mean scores indicate there is no more preparation time required than under the traditional seven or eight period day schedule. Although many teachers cited that preparing for only two or three classes a day is indeed easier, many teachers commented on the amount of time needed

for preparation under ETS. The following quotes, gathered from post implementation surveys in all four schools, are illustrative of these comments.

> Paperwork is excessive.
>
> It's difficult: trying to come up with motivating techniques, trying to cover the syllabus, trying to cope with days when my brains turn to oatmeal.
>
> I cannot be absent even if I am sick. I feel that the substitute cannot do what I would do. There is a need for detailed plans and a variety of activities. I cannot fake it for 84 minutes.
>
> Preparation is more difficult. You cannot wing it.
>
> There is a shorter time frame to prepare more material to fill extended time.
>
> At the beginning it takes time to plan and set up the course the way it should be, time to have material available for students.

These comments, reflecting increased teacher preparation time, indicate that teachers may have been forced into a "higher" level of readiness for their classes. A teacher who could "wing it" or come into class and lecture with a minimum of preparation in a 45 minute period can no longer put forth only the minimum effort under the longer periods created by ETS. These comments also indicate that some teachers may be experiencing higher levels of stress, particularly near the beginning of implementation. Stress appears related to the increased time in preparation and spending time at work even when they are ill. It should be noted, however, that many teachers also appear to be experiencing less stress and find preparation time is no greater, just different. These teachers report that extra preparation time required by longer periods seems to be off set by having fewer classes to prepare on a daily basis. Future research investigating the stresses caused by the implementation of ETS and characteristics of teachers that make them more prone to stress need to be investigated so that these stresses do not become stumbling blocks to the implementation of change.

Being better able to meet the needs of special groups of students is a reported strength of ETS (Carroll, 1994). In Schools A and B, experienced male teachers and less experienced female teachers projected significantly higher expectations of meeting the needs of students with an IEP than did less experienced males. The higher expectations of the experienced male teachers

could be due to stronger feelings of inadequacy based on a longer history of past inabilities to meet special student needs under a traditional schedule. By implementing ETS, these male teachers with greater experience may see an opportunity to address this concern. Differences between less experienced male and female teachers may be due to gender differences related to nurturance, that is, female teachers may perceive the longer class periods to offer increased opportunities to provide individual attention to students. The following comments were gathered from less experienced female teachers and more experienced male teachers in the interviews and follow-up surveys.

> We can work with more students that need help, more individualization, and more advantages for average and below average students.
>
> We have fewer students, more personal contact.
>
> I am able to do more thorough group work. Decreased class load makes it easier to know students and their strengths and weaknesses.
>
> There is more time to get actual work done since less time is spent on set-up and clean-up. It allows for more one-on-one work with individual students.

Support for ETS creating opportunities to meet the needs of students with IEPs was not universal. Many teachers, including teachers in the more experienced male group and less experienced female group, reported experiences which were contrary to those listed above.

> Attention deficit students and those with hyperactivity problems are better served in a 40-45 minute time frame. For me there is the stress of organizing projects for special education students in the longer block of time.
>
> I found that teaching below average students is a great drain on nerves and preparation. One must diligently prepare in order to keep this type of student interested.
>
> This type of schedule belongs only to [academically] superior groups.
>
> Slow learners have trouble retaining information.

Overall teachers appeared to see some advantages in being able to work with students in extended periods, however, there is some indication that the longer time blocks created by ETS may create problems particularly for less

academically able students. Conversely, teachers indicated academically superior and gifted students flourished under ETS.

Teachers overall indicated that accommodating transfer students was no more difficult under ETS than it was using a traditional schedule. Transfer students appear to offer unique problems which are managed on an individual case basis.

A majority of teachers in all four schools identified ETS as superior to the traditional schedule and given a choice would prefer to stay with ETS. The reasons teachers appear to prefer ETS reflect the following themes: ability to do group work and projects, opportunities to cover material more comprehensively, time to complete an entire lesson in a single period, and fewer interruptions resulting in more time on task. These positive outcomes of ETS are consistent with the case studies reported by Carroll (1994).

The implementation of ETS, however, should not be presented as the answer to public high schools' critics. Questions have been raised by this study about the effectiveness of ETS to meet the needs of academically struggling students and the potential negative effects of teacher stress created by increased planning and having difficult to discipline students for lengthier class periods. Several teachers also discuss how they have reduced the number of concepts taught in a course due to the reduction of teaching days from 180 days in a full year to 90 days in a semester. These teachers, particularly in the quantitative disciplines, felt the longer class periods do not compensate for the fewer days of instruction. Other teachers, particularly those in non quantitative disciplines, also commented about the reduction of content in their courses. Several non quantitative teachers saw the semester system as reducing the number of evenings available for student reading by 50%. The following four comments illustrate these teachers' concerns.

> There is pressure to learn a year-long course in a shortened time span. This works well in some disciplines (shop, biology, etc.) but is "counterproductive" in math, music, English, etc. This problem is my biggest "peeve." I do not feel math can be best learned in one half or one third of a year of "cramming."

> There is overload of information; every course content has been cut and will cause problems with college students.

> Dumping at least half of what has shown itself to be a minimally adequate course of study is a stressor. I feel that I am doing a great disservice in preparing academic students for college.

> Meeting with students [in a traditional schedule] allows them 180 days (evenings) for reading and other work. It [ETS] limits the number of concepts needed to be presented at one time, especially important in grammar and writing.

The four high schools included in this study are the first high schools in Northeastern Pennsylvania to enter into ETS. Because of the perceived success of ETS, seven additional high schools in the same region are considering a change in the time structure of their high schools for the 1995-1996 school year. Does the research on time restructuring offer enough evidence that ETS is superior to traditional scheduling in promoting student academic achievement? Joseph Carroll in The Copernican Plan Evaluated states,

> Implementing a Copernican structure will make present high school programs much more effective. But the potential impact is much greater. Implementation of any significant instructional change is dependent upon the Copernican change in the daily and yearly schedules. Failure to make this change from the traditional schedules will seriously impede effective implementation of promising ideas and the conversion of solidly based research into instructional practice. (Carroll, 1994, p. 97)

The findings of this study do not question the potential positive outcomes of implementing ETS, however, concerns expressed by teachers indicate that serious concerns about ETS exist following implementation. High schools that have identified manipulation of the time structure as the key to instructional improvement need to consider the impact of ETS on special student groups and instructional practices of teachers in both quantitative and non quantitative disciplines. Consideration of the concerns raised in this study need to be an integral part of planning the time structure that will best meet the needs of high school students.

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